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THE INTERNATIONALIZATION OF BUSINESS SCHOOLS BASED ON FACULTY ACTIVITIES: EXPLANATIONS FROM THE SOCIAL EXCHANGE THEORY

Internacionalização de Escolas de Negócios baseada nas atividades dos acadêmicos: Elucidações trazidas pela Teoria da Troca Social

La internacionalización de las Escuelas de Negocios a partir de las actividades de los académicos: Aclaraciones aportadas por la teoría del intercambio social

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ABSTRACT

The internationalization of higher education has gained in theoretical and empirical importance in recent decades. In this context, this article aims to describe and analyze the internationalization of business schools from the activities of their academics and based on the propositions defended by the Social Exchange Theory (SET). To achieve our goal we conducted 39 interviews with academics from business schools in the United States and Brazil, including Massachusetts Institute of Technology (MIT), Harvard, Getulio Vargas Foundation (FGV) and University of Sao Paulo (USP). We found that: (i) there are individual rewards that are not addressed by SET; (ii) there are benefits to third parties not covered by SET; (iii) certain non-rational choices are not provided by SET; and (iv) the condition of equivalence between costs and rewards provided by SET has its weaknesses. With these findings we add theoretical and empirical contributions to our theme.

KEYWORDS | Internationalization in higher education, academics, social exchange theory, business schools, international activities.

RESUMO

A internacionalização do ensino superior vem ganhando importância teórica e empírica nas décadas recentes. Nesse contexto, este artigo objetiva descrever e analisar a internacionalização de escolas de negócios a partir das atividades dos acadêmicos e com base nas proposições defendidas pela Teoria da Troca Social (SET, do inglês Social Exchange Theory). Para atingir nosso objetivo, conduzimos 39 entrevistas com acadêmicos de escolas de negócios dos Estados Unidos e do Brasil, incluindo Instituto Tecnológico de Massachusetts (MIT), Harvard, Fundação Getulio Vargas (FGV) e Universidade de São Paulo (USP). Temos como principais achados: (i) existem recompensas individuais que não são abordadas pela SET; (ii) há benefícios para outras partes interessadas que não são contemplados pela SET; (iii) há certas decisões não racionais não previstas pela SET; (iv) e a condição de equivalência entre custos e recompensas prevista pela SET apresenta fragilidades. Com esses resultados, trazemos contribuições teóricas e empíricas para a temática.

PALAVRAS-CHAVE */ Internacionalização do ensino superior, educação internacional, acadêmicos, social exchange theory, escolas de negócios, atividades internacionais.*

RESUMEN

La internacionalización de la educación superior ha ganado importancia teórica y empírica en las últimas décadas. En este contexto, este artículo tiene como objetivo describir y analizar la internacionalización de las escuelas de negocios a partir de las actividades de los académicos y de las propuestas defendidas por la Teoría del Intercambio Social (SET). Para lograr nuestro objetivo, realizamos 39 entrevistas con académicos de escuelas de negocios de Estados Unidos y Brasil, incluidos Instituto de Tecnología de Massachusetts (MIT), Harvard, Fundação Getulio Vargas (FGV) y la Universidad de São Paulo (USP). Los resultados principales son: (i) que hay recompensas individuales que la SET no aborda; (ii) que hay beneficios para las partes interesadas no cubiertos por la SET; (iii) que hay ciertas decisiones no racionales no previstas por la SET; (iv) y que la condición de equivalencia entre costos y recompensas prevista por la SET tiene debilidades. Con estos resultados aportamos contribuciones teóricas y empíricas al tema.

PALABRAS CLABE */ Internacionalización de la educación superior, educación internacional, académicos, social exchange theory, escuelas de negocios, actividades internacionales.*

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INTRODUCTION

The internationalization of academics is still little conceptualized in the literature, but because the topic is of interest not only to academics themselves, but also to higher education institutions, it has been the subject of long discussions in the academic area, especially at conferences. In this context, we consider that academics are operating internationally, for example, when, in performing their academic duties, they engage in transnational activities, form partnerships with authors outside their country, attain a level of international scientific impact with their publications, publish in international journals, and engage in other activities that will be covered in the course of this article (Carneiro, Bandeira-de-Mello, Cuervo-Cazurra, Gonzalez-Perez, Olivas-Luján, Parente, & Xavier, 2015; Criswell, 2014; Lazzarini, 2012; Proctor, 2016).

Although the topic of the internationalization of higher education is relevant in several areas (Altbach & Knight, 2007; Knight, 2004), in practice not all institutions and academics have opportunities and the conditions that facilitate this process. For example, 63% of the academics in Brazil have never had research experience outside the country. In the United Kingdom, on the other hand, 24% of the academics are foreigners from countries such as Italy, China, and India (British Council, 2018; Hotcourses, 2019). It is in this scenario that the research programs of higher education institutions are seeking to qualify and broaden this discussion before the international academic community by way of their professors and students (Batista & Romani-Dias, 2021). More specifically, academics have sought to publish their work in international journals and conferences, mainly to progress professionally, while maintaining their academic positions and gaining recognition. There are, however, several facilitators of and barriers to this internationalization process that deserve investigation.

As this is a topic of interest not only to academics themselves, but also to the higher education institutions in which they work, and in view of the scarcity of theoretical-empirical studies on the internationalization of academics, we begin this study with the following research question: In what ways can the internationalization of business schools be explained by the activities of academics, based on the proposals of the Social Exchange Theory (SET)?

SET deals with: (a) a broad negotiation scenario, in which two or more parties exchange resources; and (b) how these exchanges occur and how they affect the relationship between the parties involved (Cropanzano, Anthony, Daniels, & Hall, 2017). To achieve the objective of the article, we undertook 39 interviews with international academics. We identified four categories of analysis that highlight SET's weaknesses and, at the same time, offer opportunities for developing it, namely: (i) rewards result from the internationalization of academics, which was not foreseen by the theory; (ii) the benefits academics gain from internationalization are not restricted to the individual level, as originally claimed by SET; (iii) contrary to the premises of the theory, academics who choose to internationalize their careers do not do so on an exclusively rational basis; and (iv) the costs and rewards of one international activity, when compared to another, are rarely equivalent, which is contrary to the theory.

The article makes several contributions with these results. The study contributes to the practice by putting forward theoretical and empirical arguments for academics and institutions to develop their internationalization strategies, based on the perceptions of academics working in the US and Brazil. As an example, our analysis can assist higher education institutions increase their predictive capabilities vis-à-vis their professors by providing insights into the motivators and barriers present in the internationalization process in higher education. Another contribution, which is theoretical, is intended for the SET, and presents its weaknesses and the opportunities for developing it. We also discuss in this study the existence of relevant topics that are part of the internationalization process, such as motivators, facilitators, and conditions that bar the internationalization of academics.

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THE INTERNATIONALIZATION OF ACADEMICS

The concept of the internationalization of academics is still little explored. The literature has discussed the internationalization of education, the internationalization of higher education institutions, and the internationalization of students (Gu, Schweisfurth, & Day, 2010; Tran & Pham, 2016; Wit, 2020; Wu, 2018). There are few studies, however, that deal effectively with the internationalization of academics (Dewey & Duff, 2009; Sanderson, 2008; Woldegiyorgis, Proctor, & Wit, 2018; Romani-Dias, Carneiro & Barbosa, 2019; Romani-Dias & Carneiro, 2020). We shall now describe, therefore, the concepts that pertain to the topic. Internationalization is the integration process of an international, intercultural, or global extension in education, research, and the functions of a higher education institution (Knight, 2008).

Dewey and Duff (2009) mention that academics are the main agents in the internationalization process of educational institutions, through their publications, participation in conferences and research groups, membership of editorial boards, and the organization of student exchanges, among other activities that may or may not need to cross borders. International publishing, for example, is a type of internationalization activity that can be done "at home". On this point, Teekens (2004) and Sanderson (2008) highlight the engagement of academics in constructing international curriculums as one of the activities that can be done "at home", and is included in the phenomenon of internationalization. Research, for example, is an important dimension of the internationalization process. Indeed, international mobility is seen as a mechanism for increasing the dynamism of teaching activities in other countries, as is collaboration in research and building networks (Ramos, 2018; Santin, 2016).

As to what motivates academics to go international, Ramos (2018) points out that the expected determinants of internationalization are the greater impact of the research and a more international profile, since many academics seek to complement their education with periods of study or research abroad, either under the guise of a doctoral internship, or postdoctoral research. Santin (2016) adds that the motivations for international collaboration are manifold and involve both internal standards in the scientific field, and the expected benefits of joint work between countries.

The main drivers of internationalization are improvements in the quality of research, personal and institutional recognition, increased professional opportunities, and the learning that is enabled by international insertion (Carneiro et al., 2015; Criswell, 2014; Lazzarini, 2012; Proctor, 2016). The academics whom we interviewed stressed their wish to participate in the academic debate on their research topics, arguing that by doing so they would increase their potential for influence and make a practical contribution to the country. In this argument, it is noted that the professor's area or discipline will also influence their engagement with internationalization (Agnew, 2013; Leask, 2013).

Although various factors motivate academics in this internationalization process, there are barriers and/or inhibitors that can hamper or even derail it completely. In this regard, a lack of administrative and/or organizational support at the institutional or departmental level is one of the main factors that inhibits the greater internationalization of research programs and their respective academics (Ramos, 2018).

Another barrier to the internationalization of academics concerns the limitations from their (lack of) command of a foreign language (English in most cases), which particularly affects activities in the fields of human sciences and applied social sciences, in which the ability to articulate an argument is even more essential (Mazenod, 2018). Carneiro et al. (2015) and Lazzarini (2012) also argue that the main barriers perceived by academics are: (a) the difference in the procedures that international publications use to evaluate papers; and (b) the failure by some

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educational institutions to value the time and resources required for internationalization, and the effort required to produce papers. These are the main barriers encountered by the authors that hinder the internationalization process of academics.

Although we may perceive barriers in the internationalization process, certain facilitators are also available to academics. Teaching faculty who have obtained their doctoral degrees abroad learn from this experience and may later become internationalization facilitators, not only for themselves but also for the programs in which they work (Leask, 2013; Ramos, 2018). On this point, Leask (2013) argues the need for academics to internationalize so they can later develop an international career. Other factors identified as facilitators by Carneiro et al. (2015) and Lazzarini (2012) are: inclusion in international collaboration networks; the learning inherent in the process of publishing internationally; and the empirical potential that exists in some countries, such as Brazil, which comes from the plurality and heterogeneity of the various types of educational institution, both in terms of quantity and quality.

In discussing motivators, drivers and barriers to internationalization, we must take into account different academic contexts. When investigating the case of Australia, for example, Proctor (2016) argues that social isolation can be both a driver and a barrier to the country's international engagement. Majee and Ress (2018), who carried out a study in South Africa and Brazil, give another example: the "internationalization of higher education has mostly been theorized from a Euro-American perspective, taking less into account how legacies of colonial expansion impose unique demands on universities" (p. 1). From these authors we can infer that, while we can seek consensus between concepts found in the literature, we must address the peculiarities of each academic context when investigating internationalization.

SOCIAL EXCHANGE THEORY

SET emerged from economic and exchange concepts, its focus being on how social interaction happens and the factors that motivate social exchanges. Homans (1958), a precursor to SET studies, points out that all relationships are formed, sustained, or broken due to an analysis of the basic economic principles of cost-benefit. This topic was dealt with more broadly by Emerson (1972), who argues that people form and maintain relationships when they believe they will benefit from such relationships (in other words, when the benefits outweigh the costs). What an individual gives must be a cost; what they receive must be a benefit (Homans, 1958). Nye (1978) highlights nine SET propositions related to individual choices. The applicability of these propositions forms the basis of our article and, therefore, the results' analysis and discussion. The propositions are set out in Exhibit 1 below:

Exhibit 1. **Propositions of the Social Exchange Theory**

***P1**: Individuals seek to increase their rewards and avoid costs to maximize their welfare and earnings;*
***P2**: When the costs are equal, individuals will choose the path that supplies the greatest rewards;*
***P3**: When their rewards are equal, individuals will choose the path that exacts the lowest costs;*
***P4**: If two paths bring equal and immediate rewards, individuals will choose the one that supplies the most enduring reward;*
***P5**: If two paths bring long-term rewards perceived to be equal, individuals will choose the one that supplies the greatest short-term rewards;*
***P6**: If two paths bring a perception of equivalent rewards and costs, individuals will choose the one that supplies the highest expectation of social approval, or at least the one that promises the least social rejection;*

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Exhibit 1. **Propositions of the Social Exchange Theory**

Concludes
P7: *If two paths bring a perception of equivalent rewards and costs, individuals will choose the one that provides the greatest degree of autonomy;*
P8: *If two paths bring a perception of equal rewards and costs, individuals will choose the one that brings the highest financial reward, or at least the one that involves the least financial expense;*
P9*: If two paths bring a perception of equivalent rewards and costs, individuals will choose the one whose stakeholders have values similar to their own in order to agree with these values, or at least rarely disagree about these values.*

Source: Nye (1978, p. 221).

People create relationships according to the social exchange theory. Emerson (1976) presented the first approach that deals with the financial aspects, arguing that there are economic exchange relationships, which are usually of short duration and involve concrete exchanges of work for financial reward. In a second approach, he mentions that there are longer-lasting social exchange relationships that involve the exchange of less tangible, more emotional or socio-emotional resources, such as recognition and esteem, which for certain people may be of more value in a social and emotional process than financial aspects.

For SET, the movement of interactions between individuals can occur by way of social ideas and material resources (Emerson, 1976). Cropanzano et al. (2017) develop this idea, pointing out that individuals make their decisions rationally in order to maximize positive experiences and minimize negative experiences through interactions. The benefits and costs of a social exchange cannot be thought of as economic or material results, but as an image of each person's values and desires (Blau, 1986; Mazza, 2007).

In terms of human behavior, sometimes individuals seem to be motivated to increase the occurrence of positive events in their lives, and to reduce the occurrence of negative events. To do so, they use social interactions, which in turn will have positive and negative results for those taking part (Weiss & Stevens, 1993). Human needs can therefore be organized into a hierarchy of human motives (Maslow, 1954). Thus, in descending order of complexity, needs are classified into physiological, safety, love/belonging, self-esteem, and self-actualization (Hesketh & Costa, 1980; Maslow, 1954).

Among these levels, we can relate, for example, those of esteem and self-actualization to the SET. Level of esteem refers to a person's need to: (a) achieve something in order to have competence, status, consideration, zeal, esteem, and appreciation; and (b) believe and "to be someone in the world" (Hesketh & Costa, 1980). Because certain activities are too complex to perform on our own, we need other people we can trust and be recognized by. For Lawler, Thye and Yoon (2000) the implicit or explicit task in return is to generate benefits for each individual through the exchange of goods or behaviors that agents cannot perform alone. In relation to human needs, another level linked to SET is that of self-actualization, or meta-motivation, which concerns the need for perfection, the need to develop one's full potential (Hesketh & Costa, 1980). SET is related to a social process, in which individuals seek to exchange material and/or immaterial resources, establishing a relationship of trust, so that their human needs are met (Emerson, 1972).

In the case of social exchange, the general law of reciprocity may apply, as individuals may be favorably predisposed towards others because they believe they will be treated reciprocally (Cropanzano & Mitchell, 2005). A mutual exchange based on reciprocity is seen as a reductive exchange of the risk involved, and motivates reciprocal collaboration (Molm, 1994). As one party supplies benefits to the other, it is expected that those who receive the benefit will spontaneously return a benefit in order to satisfy the other party's particular need (Blau, 1986).

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METHODS

To carry out this study we adopted a qualitative research approach with an interpretive epistemological paradigm, since the study seeks to understand reality through the object studied, and the outcome is based on the researchers' interpretation (Strauss & Corbin, 1990). We used one-to-one interviews based on a semi-structured script as the main source of data for the article. We established the following criteria, which were sometimes cumulative, for selecting our respondents. They needed to: (a) be a full-time faculty member in Master's or doctoral programs in the area of business administration; (b) have published internationally between 2011 and 2016; (c) have had experience in international scientific events in recent years; and (d) have worked as teaching faculty, or enrolled as a graduate student on courses abroad.

Based on these criteria, we conducted 39 interviews with professors from 15 graduate programs in the US and Brazil. We interviewed academics from the following business schools: Harvard University, MIT, Northeastern University, Boston College, Merrimack College, Bentley University, University of Georgia, Business Administration School of São Paulo, Fundação Getulio Vargas (FGV EAESP), Brazilian School of Public and Business Administration, Fundação Getulio Vargas (FGV EBAPE), Institute of Education and Research (Insper), FEA-USP, COPPEAD Institute of Administration, The Federal University of *Rio de Janeiro* (Coppead-UFRJ) and Unisinos University (Unisinos).

The choice of location of the interviewees was a function of the different stages of the internationalization of the academic institutions, and also because all are in plural institutional contexts, thus offering, according to Creswell's (2003) precepts, a rich environment for increasing the power of generalization of the results and the applicability of the findings to other contexts. Some of our respondents work in New England, a place known for being cosmopolitan, where world-renowned universities are located, such as Harvard and MIT. The other respondents were academics working in Brazil, a relatively young nation on the international scientific stage, where, according to Elsevier (2018), less than 40% of professors are internationally mobile. Master's and PhD programs in Brazil began to increase in importance from the 1960s, and for this reason the country is still taking its first steps towards a more effective participation in international dialogue (Velloso, 2002).

As a criterion for selecting the sample, we initially chose educational institutions with a high level of internationalization. The institutions in the US are included in the Carnegie Foundation (2018) ranking of regional or global internationalization; in Brazil we selected institutions with some degree of internationalization, following the report published by Capes (2017), an organ linked to the Brazilian government, within the Ministry of Education. To conduct the interviews, we used a semi-structured script divided into three dimensions: (a) the respondents' scientific trajectory; (b) their perceptions of the concept of internationalization; and (c) their strategies and choices for international activities, based on the precepts of SET (Kerlinger & Lee, 2000).

The first stage of data collection was carried out in Brazil in 2016, while the second collection stage took place in the U.S. in 2018, and the third in Brazil in the first half of 2019. At the end of the last phase of the study, we interviewed 20 professors working in Brazil and 19 professors working in the U.S., a total of 39 interviewees. Of the total number of interviews, 24 were in person, 14 via Skype and one by phone. The average duration of the interviews was 50 minutes. In quoting respondents in our results section, we have used pseudonyms.

Our main intention in this phase was to compare points of convergence and divergence with regard to the internationalization of academics, according to the perceptions in relation to the SET propositions, thus increasing the internal validity of the research (Creswell, 2003). From the description of the phenomenon of the internationalization of academics and SET, we sought to discover patterns in the data and develop categories that

contribute conceptually. We compared the main categories that emerged from the codification with the theory to form new analytical perspectives, which served as the basis for our analysis of the set of propositions that comprise the SET, and for identifying possible weaknesses (Guba & Lincoln, 2005).

FINDINGS

Individual rewards not handled by SET

From the interviews, we found that these academics expect different types of reward from their international activities. Aspects such as recognition and reputation are most frequently cited by the interviewees. They point out that when they publish their work internationally, they receive visibility and recognition from other academics, from educational institutions, from journal publishers, and also from the wider academic environment, according to the quotes from Chris, Jennifer and Jacob:

> The reward accrues more to the individual than to the institution or in terms of money. [...] it's knowing that I'm being talked about, engaged, respected [...]. (Chris)

> I think that reputation is the most important thing, for those who value an international reputation—to enter these circles—to be invited to conferences, to begin to be considered as someone and not just a silent voice. (Jennifer)

> They're going to publish a study using my method. So, this will increase the visibility of my work. I think that's the main benefit for me. (Jacob)

In addition to recognition and reputation, the interviewees highlight that the learning gained from entering the academic world is another form of reward. They claim that publishing at the international level provides continuous learning, because discussion, research into new topics, and interaction with other academics generate a higher level of learning and networking. According to Ethan, Miguel, and Alexander:

> This learning is continuous and comes from several sources. I can even learn by participating in PhD thesis committees. (Ethan)

> I think learning from internationalization is essential, because it puts us on another level in terms of quality. (Miguel)

> When you're a researcher, cultural differences are interesting; it's so much more of a learning opportunity. (Alexander)

The academics also highlighted that professional opportunities are themselves rewards of this process, because when publishing internationally they perceive opportunities for professional and academic advancement and participation in events, among other international professional opportunities. According to Anthony and Sandrine:

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> You have a better chance of advancing your career; more chances of moving to a better quality university; and more chances of being invited to go abroad to further develop your skills. (Anthony)

> You can get support for international events; you can get support for proofreading and translation in the case for articles into English; and you can take sabbaticals. (Sandrine)

Finally, the academics cite personal satisfaction as an important reward for this process. They claim that this is an aspect that is related to personal rewards as it provides them with a feeling of personal fulfillment when they overcome the challenges posed by this type of activity and make decisions that they believe to be correct, especially in terms of doing what they like. The following quotes are from Leslie, James and Noah:

> In terms of rewards, I would add the psychological. There's something about the personal benefits you get from doing something good. It's personal fulfillment. The benefit is something that you, as a researcher, have to pursue. (Leslie)

> The rewards to me are seeing other places, which is something I value. And I meet people from many different places—another thing I really value. The reward to me is based on being exposed and seeing many different cultures and many different things around the world. And that I like. I like filling up my passport with stamps. (James)

> At my university, this is what will give me the most points; I, too, will be more fulfilled. (Noah)

Thus, we see that individual rewards accrue from the research activity, both personally and professionally, and that they are related to issues that are both objective and subjective for each academic.

Benefits for third parties not envisioned by the SET

The second category of analysis refers to the benefits of going international. From the interviewees' statements, we see that there are individual benefits, but also collective benefits resulting from this process. When carrying out international activities, the academics state that they seek to contribute to other publics, such as their students and advisees, with the training of other academics, with educational institutions and organizations, with their area of activity, and with the country.

The main aspect of this category is the benefit that students and advisees derive. Many interviewees believe that by carrying out international activities they will help educate their students better by imbuing them with a global perspective. They also believe that they help steer them towards the international scenario, as highlighted by Benjamin, Alice, and Ethan:

> Preparing our students better to do programs abroad. (Benjamin)

> This path of development for university faculty obviously has a positive impact on the students you mentor—the doors you can open for these students. These international contacts I have, I've already made available to PhD students for research purposes. (Alice)

> Every year a larger proportion of my students comes from abroad. And so, as I teach them and involve them in my research, I am necessarily thinking about education globally. (Ethan)

Another benefit stressed in the interviews refers to the contribution to the area of specialization of the academics. This is because through international publications, it is possible to expand dialogue and debate a given topic, which also helps the school advance internationally. In this regard, the quotes from Noah and Jayden are pertinent:

> Being able to participate in a worldwide debate in your area and being one of the actors that makes your art progress instead of staying on the sidelines. Of course, several modalities that are considered internationalization derive from this, but you will only be able to do this activity if you are able to talk persuasively and advance your area internationally. (Noah)

> Contributing to the school is a part of me. (Jayden)

In addition to the benefits for students, advisees, and the field of action, the interviewees highlighted the benefits for: (a) the education of other academics (when publications have a local impact, for example); (b) educational institutions and organizations (when the work benefits the institution and/or organization with which the interviewee is linked); and (c) the country (when the research is sufficiently comprehensive and therefore generates an impact on practice). Trish, Helena, and Alexander all spoke along these lines:

> For me there's the issue of your thinking about the project of the institution, the organization in which you are inserted. (Trish)

> Internationalization helps the educational institution in terms of internal evaluation and increases access to funding. (Helena)

> It's part of my job to invest in the future of new researchers; it's a benefit to me and a benefit to (and from) the university. (Alexander)

So in addition to individual benefits for academics, the data indicate that there are also benefits for third parties from the activity of internationalization, ranging from students and advisees, to the educational institution itself, and even the country in which the academic works. This view is more comprehensive than the one initially proposed by SET.

Non-rational choices not envisaged by the SET

In addition to rational choices for internationalization, another factor identified as being responsible for the internationalization of academics is the coercion they endure from the educational institutions in which they work, which is motivated by their interest in obtaining high grades for their Master's degree and doctoral programs. Despite the coercion they are subjected to, the interviewees see that this process is necessary for the evolution

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of the program in which they are working. This situation appears more frequently among Brazilian academics. The following are reports by Alexander, Arthur, and Elijah:

> My rector has talked to me about going international; he has said that it although it's a goal of the university, it does not bind each individual. Each person chooses whether to do so or not, and the degree of internationalization they want to achieve. (Alexander)

> Internationalization is increasingly relevant; it's becoming ever more important. So it's natural that there is pressure, a drive to getting published, towards looking at the foreign rankings. (Arthur)

> There's pressure to publish a lot. (Elijah)

Other factors identified as non-rational choices are luck and opportunity. The interviewees say that luck plays a part in getting accepted by international publications without guidance from someone more experienced, and having one's career leveraged in the middle of a not very favorable scenario. They also report that as well as being diligent students, they had the opportunity to learn and grow in cultural, personal, and professional aspects, according to quotes from Robert, Aiden and Alexander:

> I thought I needed to grow, and I got lucky. (Robert)

> My first international activity was as a student. [...] for my Master's thesis, I had to do fieldwork. (Aiden)

> I would say that the choice is one of opportunity. (Alexander)

The influence of family and choices made on impulse are also determining factors in this process, showing that they are not always strictly rational. Some academics interrupt their work overseas to work as academics in their country of origin and be geographically closer to their families. Choices taken on impulse also represent another aspect for internationalization, for example, because academics get involved in issues that they find personally and professionally appealing, but which render their choice irrational and unplanned. Ethan and Leslie's statements illustrate this reality:

> When I left my PhD program, I had the option of staying there in the U.S. or there in the international market. Even my advisor wanted me to stay. My wife, however, really wanted to come back, wanted to return to Brazil; so then I left in search of schools that had a strong research orientation. (Ethan)

> [...] I have an older brother who is a missionary; and when I was 18, I went to visit him. He was living in Romania. And that was my first international trip. (Leslie)

Another aspect that was mentioned in the interviews relates to the academics' curiosity. In fact, academics may believe that going outside the borders of their country of origin and going international is a charming challenge that will provide them with knowledge of new countries and cultures. Interviewees Aiden, William, and Rafael illustrate this point:

> The focus on internationalization became a practice in the field, and then we asked ourselves, well, what does that mean? Why are we doing this? [...] so, what was driving me was curiosity much more than anything else. (Aiden)

> Interest: I was always interested in understanding other countries better. (William)

> There is a great cultural gain, because in fact I've already visited many countries. [...] traveling for various reasons—for research partnerships—especially congresses, workshops—things like that. [...] In terms of your cultural gain, it's a great positive experience. (Rafael)

The evidence makes it clear that the main justifications presented by the interviewees for their internationalization choices are not necessarily rational and planned, since in several situations internationalization seems to occur extrinsically and, in many cases, not in accordance with the academic's own will. This is yet another point that needs to be developed by SET.

The equivalence between rewards and costs envisioned by SET has its weaknesses

For the interviewees, many activities seem to generate overt different perceptions of cost-benefit. The time invested in writing for international publications and high-impact journals, for example, is greater than for local publications. Thus, projects that demand more time, dedication, and effort are correlated with high expectations of reward. An example of this expectation may be the personal cost to the individual that being far away from their family causes. Therefore, for some of the interviewees, when a publication at this level is rejected, the expected reward may not compensate for the cost incurred.

In addition to international publications, other activities that are carried out in an international context and that involve the academic's family become an emotional and financial cost that must be evaluated. This aspect is mentioned by Ethan, Alexander, and Lucas:

> I get more points if I publish in an A1 journal, in the A1 tier. But the time you spend to publish, for you to publish in a top journal, is much more—let's be honest—than in any national journal. The national (Brazilian) journals have evolved a lot in quality, but the time required is much more if you make the calculation rationally. I mean, what you get there [...] I think it's not worthwhile, honestly. It's not worthwhile. (Ethan)

> If I wanted to spend a year in any country, they would pay me to relocate my family for a year so I could work there. So it's an incentive in that regard. (Alexander)

> The advantage is that my work is well known abroad, and for the department this is important. [...] And I sell more books, too; so I have to leave my wife behind (she occasionally goes with me but usually, she's unable to). And we have dogs too, so I miss them. (Lucas)

In addition to the personal costs that involve their family members, there are financial and mental costs. Resilience becomes an important skill for academics so they do not become discouraged, and focus instead on

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dealing with these costs, often keeping in mind the rewards that will come from each activity. As Peseta, Barrie and Mclean (2017) have already pointed out, "academic life is a peculiar kind of difficult work" (p. 453), which demands resilience on the part of academics, sometimes due to the high intellectual demands of their professions, and sometimes due to the devaluation of their work in certain contexts. For other academics, the rejection of their papers at the top international level is a way of learning how to evolve in their research. Lucas and Sandrine made a similar point:

> An important journal at the international level, whatever the area, will have a rejection rate of 90% or 95%. Therefore, if you want to be among the 5% or 10% accepted, you'll have to work hard. All of my initial articles were rejected; all of them, and with really negative comments. But that wasn't the end because I worked and worked and worked. I kept trying and eventually I got accepted. (Lucas)

> In a submission to an international journal, if you get a "desk reject" (which is quick—around 15 days or a month), you have your answer: your paper is not a good fit for that journal. Then you can work on it and send it to another one, in which case it may be sent out for a long review. (Sandrine)

Costs and rewards, therefore, may vary according to the time and dedication given to each project. Each academic will also choose and evaluate differently, depending on whether their activities are achieving the expected and desired reward. Just as the costs involved are not only financial, but emotional, physical, and mental, so are the rewards.

DISCUSSION AND CONCLUSION

The purpose of this article was to describe and analyze the internationalization of business schools based on the activities of academics and the propositions defended by the Social Exchange Theory (SET). We identified that there are theoretical assumptions that can be adapted and/or complemented by SET for explaining the phenomenon of internationalization, and this was the main contribution of our article.

In our first category of analysis, individual rewards, SET highlights the financial aspect as a relevant reward (Blau, 1986; Emerson, 1976; Nye, 1978). We extend this assumption, showing that, based on the results of the interviews, some individual rewards are not addressed by SET. The interviewees seek rewards other than merely financial, such as learning, recognition, reputation, networking, professional opportunities, and personal satisfaction.

The studies by Homans (1958) and Mazza (2007) point to this evidence, observing that: (a) the benefits and costs are thought of in terms of an image of the values and desires of each person; and (b) some social exchanges entail obligations that cannot be exactly explained and negotiated. Rewards may include pleasure, satisfaction, gratification, and the fulfillment of needs. Thus, when seeking internationalization, academics make tradeoffs in which they are rewarded with material benefits and social and non-monetary values.

With regard to the second category, that is, the existence of benefits for third parties that are not contemplated by the SET, Nye (1978) states that SET is primarily concerned with self-interest and that individuals have a combination of economic and psychological needs. Homans (1958) and Emerson (1972) also stress this proposition when they say that people form and maintain relationships when they believe they will benefit from

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them. Cropanzano and Mitchell (2005) point out that SET is a search for reciprocity, and that relationships are governed by collective gain. The interviews reinforce this argument, as the benefits are not only for the international academic at the individual level. Indeed, they also work collaboratively, to the benefit of students, advisees, other academics, educational institutions, organizations, countries, and areas of activity. Academics, therefore, do not seek internationalization merely for their own benefit.

Furthermore, the data reveal that there are choices of a non-rational character that are not envisaged by SET, a result that diverges, to some degree, from the claims of Nye (1978) and Cropanzano and Mitchell (2005), who believe that the choices academics make to go international are substantially rational. According to the criticisms of Zafirovski (2005) in relation to the theory, and also from the interviews, we found that several other factors drive academics in the direction of internationalization, such as luck, curiosity, impulse, family issues, and institutional pressures, a result that converges with the study of Majee and Ress (2018).

Finally, Nye (1978) uses the SET to address the possibility of frequent equivalence between the rewards and costs of certain activities. However—and bolstering our phenomenon— the interviewees claimed that international activities result in measurably different costs and rewards. As Agnew (2013) and Leask (2013) point out, the professor's field of study will also influence the cost-benefit ratio of his/her internationalization process. In the case of business schools, for example, it is more common for professors in the area of company internationalization to pursue their own career internationalization than professors in other disciplines. Another example is the submission of articles to top international journals, which generates critical and rigorous feedback from the editors and reviewers of these journals, and contributes to the learning process of the academics involved, especially when an article is rejected. Exhibit 2 provides a summary of the characteristics of the SET and its opportunities:

Exhibit 2. **Weaknesses of the Social Exchange Theory and complementary opportunities**

SET summary	Weaknesses and opportunities according to interviewees
The rewards resulting from the activities of individuals are measurable and relatively predictable (Nye 1978).	The rewards of complex activities are not easily measurable and predictable: *"this learning is continuous and comes from several sources. I can even learn by participating in PhD thesis committees." (Ethan)*
Individuals make their choices based on their individual interests (Nye 1978).	Individuals often make their decisions based on benefits to third parties, which go beyond their individual benefits: *"it's part of my job to invest in the future of new researchers; it's a benefit to me and a benefit to (and from) the university." (Alexander)*
Individuals make their decisions rationally (Nye 1978).	Individuals often make decisions based on criteria such as intuition, emotion, and institutional pressures: *"I consider what I'm interested in and passionate about first. If I'm not passionate about the project, I won't have the strength to go through with it." (Leslie)*
Individuals must decide between a series of alternatives with equivalent rewards and costs (Nye 1978).	Individuals often decide between alternatives that, despite having an apparently advantageous cost-benefit, provide very different rewards and costs, and therefore are not equivalent: *"so it depends a lot on the attitude of the person, who knows they want to try this and goes after it and has to be resilient because it's an activity where you'll get mostly rejects [...]." (Noah)*

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This article also has some limitations, among which we highlight the need to investigate the application of SET in other fields of knowledge, given the scarcity of its use in research dealing specifically with the context of education. This is also an opportunity for future studies, however, and we underline the need for interdisciplinary research into the applicability of the social exchange theory, since it is a classic, albeit current theory, in the field of applied social sciences. More broadly, during our study we identified the need for more theoretical research into the major theme of the internationalization of higher education. Such studies could, for example, continue with our effort to understand the perceptions of academics from different countries.

For our study we selected a sample of academics who are heavily involved in internationalization activities. We suggest future studies should analyze the perceptions of academics who are at the beginning of this international trajectory, and of those who do not seek to go international. These investigations would result in different points of view that would be useful for a better understanding of this phenomenon.

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AUTHORS' CONTRIBUTIONS

Marcello Romani-Dias, Angela Maria Scroccaro Biasoli, Jorge Carneiro, and Aline dos Santos Barbosa worked on the conceptualization and theoretical-methodological approach. Marcello Romani-Dias, Angela Maria Scroccaro Biasoli, Jorge Carneiro, and Aline dos Santos Barbosa worked on the theoretical review of the article. Marcello Romani-Dias and Angela Maria Scroccaro Biasoli coordinated data collection. Marcello Romani-Dias, Angela Maria Scroccaro Biasoli, Jorge Carneiro and Aline dos Santos Barbosa participated in the data analysis. Marcello Romani-Dias and Angela Maria Scroccaro Biasoli participated in the writing and final review of the manuscript.

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PSYCHOLOGICAL DISTANCE IN THE DIASPORA MARKETING OF NOSTALGIC PRODUCTS: A VENEZUELAN CASE

Distância psicológica no marketing de produtos nostálgicos para comunidades em diáspora: O caso venezuelano

Distancia psicológica en el marketing de productos nostálgicos para la diáspora: Caso venezolano

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ABSTRACT

With this first systematic review of specific literature about diaspora marketing, it was found that this emerging literature focuses mainly on opportunities related to trade, tourism, and the acculturation between countries with different languages in only one host country. This research contributes toward a greater understanding of diaspora buying behavior using the construal level theory, specifically regarding the purchase of nostalgic products and services, examining the case of Venezuelan diaspora in the broader international context of five host countries: Colombia, Peru, Chile, Ecuador, and Panama Another contribution is the use of e-WOM metrics derived from advertising posts on Instagram. The results show that diaspora consumers in host countries that have higher levels of individualism, less masculinity, and are further geographically from their homeland seek to consume greater amounts of nostalgic products.

KEYWORDS */ Diaspora marketing, e-WOM, cultural dimensions, nostalgic products, construal level theory.*

RESUMO

Esta primeira revisão sistemática da literatura sobre marketing de diáspora revela que os emergentes estudos têm por principal foco as oportunidades relacionadas ao comércio, turismo e a aculturação de pessoas em diáspora originárias de diversos países com idiomas diferentes em relação a apenas um país anfitrião. Esta pesquisa contribui para uma maior compreensão do comportamento de compra de comunidades em diáspora, especificamente em relação a produtos e serviços nostálgicos, usando a Teoria do Nível de Interpretação e considerando o caso da comunidade venezuelana em diáspora no contexto internacional mais amplo de cinco países anfitriões: Colômbia, Peru, Chile, Equador e Panamá. Outra contribuição do estudo é o uso de métricas e-WOM derivadas de postagens de publicidade no Instagram. Os resultados mostram que consumidores em diáspora vivendo em países com níveis mais elevados de individualismo, menor masculinidade e maior distância geográfica de sua terra natal, tendem a apresentar maior consumo de produtos nostálgicos.

PALAVRAS CHAVE / Marketing de diáspora, e-WOM, dimensões culturais, produtos nostálgicos, teoria do nível de interpretação.

RESUMEN

A través de esta primera revisión sistemática de la literatura específica del marketing de la diáspora, se encontró que ésta literatura emergente está enfocada en las oportunidades de comercio, turismo y aculturación entre personas de países con diferentes idiomas en un solo país anfitrión. Esta investigación contribuye a comprender el comportamiento de compra de la diáspora, específicamente con respecto a productos y servicios nostálgicos, en un contexto internacional más amplio considerando cinco países anfitriones: Colombia, Perú, Chile, Ecuador y Panamá, y utilizando la teoría del nivel de conceptualización. Otra contribución es la utilización de las métricas e-WOM derivadas de publicaciones publicitarias en Instagram. Los resultados muestran que los consumidores de la diáspora de los países anfitriones con una mayor cultura individualista, una menor masculinidad y una mayor distancia geográfica de su tierra natal prefieren el consumo de productos nostálgicos.

***PALABRAS CLAVE** / Marketing de la diáspora, e-WOM, dimensiones culturales, productos nostálgicos, teoría del nivel de conceptualización.*

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INTRODUCTION

The flow of people between different countries is an age-old phenomenon that has attracted global attention due to the tremendous increase in the number of people moving from their home countries to settle in a host nation. In the last three decades or so, the world has witnessed an unprecedented movement of people. Statistics on global migration show that in 2018, 258 million people were residing in a country other than their country of birth, an increase of 49.1% compared to 2000, and 153% compared to 1980 (Vidal & Tjaden, 2018). This phenomenon, known as "diaspora," is defined by Safran (as cited in Tambiah, 2017, p. 169) as "expatriate minority communities that keep nostalgia or fantasy about their homeland."

The term “diaspora,”, was first used around 250 BC when the Hebrew Bible was translated into Greek. This translation, the Septuagint, used the verb *diaspeirein* and the noun *diasporá* to refer to the condition of spiritual agony accompanying the banishment of the Jews by an angry God. Currently, several different terms, such as “immigrant,” “ethnic community,” “refugee,” “exile,” and “overseas community,” share the same rough meaning (Tambiah, 2017).

Since 2014, Venezuela has been experiencing a massive wave of emigration. As of April 2019, more than 1.2 million Venezuelans were living in Colombia and 728,000 in Peru, the two largest diaspora concentrations in the region, followed by Chile, Ecuador, and Panama with 288,000, 263,000, and 94,000 Venezuelans, respectively (R4V, 2019). This scenario, the largest migratory exodus in Latin American (LA) history, is an opportunity to undertake research into diaspora marketing.

Legal and political restrictions have surrounded the Venezuelan exodus. In 2015, neither visas nor passports were required for these migrants thanks to regional integration agreements (the Andean Community and Mercosur). This situation changed in August 2017, however, when Venezuela was suspended from Mercosur and lost immigration benefits. Specifically, the member countries of these regional communities accused the Venezuelan government of having violated the “democratic clause” of the agreement (R4V, 2019), and from that moment on each country determined its own immigration policy. In October 2017, Panama was the first country to request that Venezuelans present a passport and visa upon entry. Peru, Chile, and Ecuador implemented passport and visa requirements in 2019. Colombia allowed only temporary entry permits, always with a passport. But Venezuelans report that obtaining a Venezuelan passport is difficult due to the high cost and bureaucracy. Before 2017, most Venezuelan immigrants entered these countries illegally, so Colombia, Peru, and Ecuador implemented regularization policies with temporary permits that allowed Venezuelans to work and obtain access to healthcare and primary education for children. Current policies discourage legal migration, and a humanitarian visa is the only legal route available to Venezuelans, but many humanitarian visa requests are not being granted (R4V, 2019).

Nevertheless, over 5 million Venezuelans live abroad (R4V, 2019), and understanding how these diasporas fulfill their needs is essential. Unfortunately, systematic literature review results on diaspora marketing show that relevant studies are mostly qualitative and descriptive; only 23% of the selected articles are quantitative with some theoretical support. Some studies aim to explain the impacts of diasporas from an economic perspective, such as the enhancement of trade opportunities between countries due to the advantage migrants have of knowing the needs of both countries (Artal-Tur, Ghoneim, & Peridy, 2015; Kumar & Steenkamp, 2013; Tien & Luan, 2015). Other studies focus on the tourism opportunities involved in taking migrants back to visit their homeland (Morgan, Pritchard, & Pride, 2003; Murdy, Alexander, & Bryce, 2018; Weaver, Kwek, & Wang, 2017; Yousaf & Samreen, 2016).

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This study, which focuses on the Venezuelan case, aims to explain how the psychological distance created by the different social, spatial, and time contexts (that are specifically cultural differences) of the home and host countries of a diaspora leads to the consumption of nostalgic products. "Nostalgia" is described as "a sentimental longing or a wistful affection for a period in the past" (Oxford Dictionary, n.d.).

This research makes three contributions to the emerging literature on diaspora marketing. First, a detailed literature review of diaspora marketing, the first literature review on this topic, was undertaken to distinguish this perspective from that of other disciplines that also study diasporas. Second, the Construal Level Theory (CLT) (Liberman, Trope, & Wakslak, 2007) is extended to a new domain to help explain the behavior of diaspora consumers in a broad, international context. Focusing on five host countries was innovative, as prior studies focused on only one, which means that theoretical external validity has been extended. Third, this study uses e-WOM metrics to confirm hypotheses about diaspora consumers' search for nostalgic products. The following section presents a literature review undertaken to summarize the most commonly studied themes of diaspora marketing.

LITERATURE REVIEW

This literature review aims to analyze the literature on diaspora marketing specifically, not with regard to diaspora in general. To focus on the domain target, a systematic search was carried out to identify relevant articles published on the subject, and therefore the major bibliographic databases and search engines, like WoS, EBSCOhost, Science Direct, Emerald, JSTOR, and SpringerLink, were consulted. Only articles published in the fields of communications, hospitality, leisure, sports, tourism, economics, management, and business were selected. After reading the articles to make sure they fit into the diaspora marketing domain, the final review comprised 35 articles (Exhibit 1). This literature review helped this study target the main research topics in diaspora marketing. It also helped identify the evolution of diaspora marketing, relevant theories, conceptual perspectives, and the methodologies used, and it helped to confirm the gap in the literature that this article addresses.

Exhibit 1. **Representative research in diaspora marketing organized by year**

Author(s)	Methodology	Theoretical/ Conceptual Perspective	Home and host countries
Quinn and Devasagayam (2005)	Quantitative	Acculturation and self-identified ethnicity	Indian diasporas in the USA
Frank et al. (2012)	Quantitative	Customer Satisfaction Index structure	Chinese diasporas in Japan
Kumar and Steenkamp (2013)	Qualitative	Acculturation Theory	Indian diasporas in the USA
Holak (2014)	Qualitative	Nostalgia approach and sociological, historical, and cross-cultural perspectives	Russian diaspora in New York, USA
Cross and Gilly (2014)	Mixed	Cultural Capital Theory	Filipino, Mexican, Taiwanese, Chilean, Australian, Iranian, Belarussian, Vietnamese, and South African diasporas married to a spouse born in the USA

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Exhibit 1. **Representative research in diaspora marketing organized by year** Concludes

Author(s)	Methodology	Theoretical/ Conceptual Perspective	Home and host countries
Demangeot et al. (2015)	Qualitative	Acculturation Theory	--
Artal-Tur et al. (2015)	Quantitative	Network approach in trade-migration relationship	Egyptian diasporas in France
Badinella and Chong (2015)	Qualitative	Economic sociology, social embeddedness, and social relations	Black African diasporas in London, the UK
Brillon (2015)	Qualitative	Political economy	Filipino diasporas worldwide and in the Philippines
Tien and Luan (2015)	Quantitative	International trade theories	Chinese diasporas in Taiwan
Chandrasen (2016)	Quantitative	Acculturation Theory	International students in the UK
Kim and Chen (2016)	Qualitative	Acculturation Theory	Asian diasporas in the USA
Yousaf and Samreen (2016)	Quantitative	Country Brand Perspective	Pakistani diasporas in Chinese and Malaysian universities
Dey et al. (2017)	Qualitative	Acculturation Theory	Asian diasporas in the UK
Guzmán et al. (2017)	Quantitative	Self-concepts	Mexicans in Mexico City and Mexican diasporas in the Dallas/Fort Worth, USA metro area
Papadopoulos et al. (2017)	Quantitative	Product-Country Image and Animosity Theory	Egyptian diasporas in Canada
Weaver et al. (2017)	Qualitative	Cognitive, affective, and conative reactions	Tourists of Chinese ethnic origin in mainland China
Henthorne et al. (2018)	Quantitative	Social identification theory	People of African descent in South Africa, Brazil, and the USA
Zhao et al. (2018)	Quantitative	Cultural effects	Chinese-American consumers
Dey et al. (2019)	Qualitative	Acculturation Theory	Ethnic consumers in London, the UK

The concept of diaspora marketing is recent and emerging: academic interest in diaspora marketing had grown slowly until four years ago, after which 71% of the articles were published. Of the papers selected, 54% are qualitative, 43% are quantitative, and 3% used mixed methods. Moreover, 56% use theoretical support: 20% Acculturation Theory, 11% economic theories, 11% country and cultural theories, 6% psychological theories, and 6% sociological theories, while the remaining 44% are descriptive and empirical without any theoretical support.

One of the theoretical approaches used in this domain is Acculturation Theory (AT) and the consumer acculturation process (Penaloza, 1994). Brown (1980) suggested that the diaspora acculturation process comprises four stages. Kumar and Steenkamp (2013) segmented diaspora consumers to help emerging market companies build international brands. Demangeot, Broderick and Craig (2015) explained the process of multicultural adaptation in geographic marketplaces. Based on the level of acculturation, Kim and Chen (2016) explained the diaspora's response to localized or de-ethnicized product strategies. Dey, Balmer, Pandit, Saren and Binsardi (2017) explained the diaspora's dual acculturation process of adoption and integration. Dey et al. (2019) also conceptualized how consumption of ethnic products affects a diaspora's acculturation. Quinn and Devasagayam (2005) adapted and validated the Suinn-Lew ethnicity scale from social psychology to measure diaspora acculturation.

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Studies based on economic theories, on the other hand, mostly tried to explain how networks of migrants help homeland businesses (Brillon, 2015; Artal-Tur et al., 2015; Tien & Luan, 2015). Badinella and Chong (2015) used economic sociology, social embeddedness, and social relations to study black diaspora esthetic practices in the art market. Frank, Abulaiti and Enkawa (2012) explored differences in customer satisfaction, repurchase intent, and word-of-mouth intent between Chinese-born and locally born consumers in Japan. Yousaf and Samreen (2016) studied the influence of the media on Pakistani brand reputation. Most recently, Papadopoulos, Banna and Murphy (2017) evaluated the effect of affinity, animosity, and images of the homeland on purchase intentions.

From a sociological standpoint, Henthorne, Williams and George (2018) examined the African diaspora's complaining behavior based on the Social Identification Theory. Holak (2014) studied nostalgic evocation through traditional Russian cuisine. Finally, empirical and descriptive papers were dedicated to studying diaspora tourism (Murdy et al., 2018), the international penetration of products by way of diaspora networks (Bundas, 2018), diaspora consumer behavior (Morgan et al., 2003), food (Mostafa, 2018), consumer acculturation and retailing (Bundy, 2017), and damage to diaspora image caused by bad press (Ogunyemi, 2018).

Regardless of the theoretical foundation used to study diaspora behaviors, cultural factors seem to be a key element. To illustrate the effect of cultural factors, Cross and Gilly (2014) found that families with bicultural immigrant spouses engaged with the host culture faster than monocultural families. Another study based on Hofstede's cultural dimensions showed the influence of cultural gender roles (Zhao, Sun, Devasagayam, & Clendenen, 2018). Similarly, Guzmán, Paswan and Fabrize (2017) showed that brand perception is different for Latinos residing in their home country than for immigrants because of cultural differences. Weaver et al. (2017) found that Chinese diaspora members have a higher degree of cultural connectedness with China.

Since the systematic literature review was concluded, other papers have been recently published, but they do not change the conclusions of the review. These papers focused on the influence of diaspora networks on product diffusion (Elo, Minto-Coy, Silva, & Zhang, 2020; Matejowsky, 2020), and how levels of diaspora acculturation are related to leisure travel motivations and desired experiences in the motherland (Preez & Govender, 2020).

This review shows that diaspora marketing literature focuses primarily on explaining business impacts, drivers, and opportunities, and attaches little importance to understanding the diaspora's purchase of nostalgic products. This is a gap in the literature.

Another important topic to review is word of mouth (WOM), which is the way consumers share information about goods, services, brands, or companies with other consumers. Electronic word of mouth (e-WOM) refers to when this information is shared on the Internet (for example, via likes, reviews, comments, tweets, blog posts, etc.) (Rosario, Sotgiu, Valck, & Bijmolt, 2016). Evidence of the positive relationship between e-WOM and sales is abundant (see Rosario et al., 2016), and for this reason, measuring e-WOM is a valid way of estimating purchase behavior. eWOM includes non-textual communication, such as "liking" or "re-tweeting", as well as comments. It can be defined as a potential or actual client's positive or negative assessments of an ad, brand, or company. Moreover, an Instagram user, instead of writing a comment or sharing a post, can click the "like" button as a quick way of showing their approval, because Instagram's primary interaction and communication method is through images and likes. The literature on internet communication considers liking and commenting on a post to be e-WoM, because when liking or commenting a user expresses a public opinion (Vries, Gensler, & Leeflang, 2012). Specifically, Rosario et al. (2016), in their meta-analysis, found that the number of e-WOM likes is more powerful for affecting sales than any other qualification metric, either positive or negative (valence).

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THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

Different theoretical frameworks were used to explain diaspora marketing, and they mostly focused on AT and theories from economics, psychology, and sociology. These studies (Table 1), however, were mainly carried out in contexts with significant language barriers and a huge cultural distance between the host and home countries (Chandrasen, 2016; Dey et al., 2017, 2019; Kim & Chen, 2016), The context of the Venezuelan case is different: specifically, there is no language barrier, since Spanish is the official language in all the studied countries. Neither are these countries experiencing military or religious conflicts, which are conditions that usually generate brand animosity (Papadopoulos et al., 2017). Theoretically, AT is used to describe the diaspora's process of adaptation and assimilation into the host country's culture (Brown, 1980). The purchase of nostalgic products indicates the opposite phenomenon: the diaspora's culture of origin is being affirmed, signaling the lack of an acculturation process. De-Juan-Vigaray, Garau-Vadell, and Sesé (2021) found a relationship between the length of residence and acculturation and, subsequently, shopping acculturation, which refers to the level of attachment to businesses associated with one's ethnic origin. In this case, the shorter the length of residence, the less the Venezuelan diaspora should be acculturated; this would mean less shopping acculturation to the host country, and maintenance of an attachment to the home country. Consequently, AT describes only the diaspora's adaptation process and does not possess the mechanisms for explaining a preference for nostalgic products, which the CLT does (Heinberg, Katsikeas, Ozkaya, & Taube, 2019).

Table 1. **Research on diaspora marketing using acculturation theories**

Host / Home country	Language	Cultural Distance (Kogut & Singh, 1988)	Authors
USA/India	English/Hindi	75.4	Quinn and Devasagayam (2005)
Japan/China	Japanese/Mandarin	79.8	Frank et al. (2012)
England/Nigeria	English/Hausa	87.2	Badinella and Chong (2015)
France/Egypt	French/Modern Standard Arabic	85.0	Badinella and Chong (2015)
USA/China	English/Mandarin	112.1	Kim and Chen (2016)
USA/Philippines	English/Tagalog & English	84.2	Kim and Chen (2016)
USA/Mexico	English/Spanish	87.1	Guzmán et al. (2017)
Canada/Egypt	English & French/Modern Standard Arabic	100.0	Papadopoulos et al. (2017)
England/China	English/Mandarin	100.7	Dey et al. (2019)

Note: The calculation of Cultural Distance was made using the indicators of Hofstede (2019)

For this reason, the present study uses the CLT as its framework (Liberman et al., 2007), which helps explain how people think of "distant" events and why they prefer nostalgic brands and products, which are associated with socially, spatially, and temporally distant events (Heinberg et al., 2019).

According to the CLT, construal is an interpretation of events. To represent "near" events, individuals use concrete, low-level construal, unstructured, incidental features, and rich details. In contrast, to represent distant events individuals use high-level construal abstraction and schematic, decontextualized representations, omitting secondary and incidental features (Trope, Liberman, & Wakslak, 2007). It has been found that there exists a

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relationship between psychological distance and abstraction, specifically temporal difference in abstraction, and this provides evidence of the relationship between construal and the dimensions of spatial distance, social distance, and the probability that an event will occur (Trope et al., 2007). Specifically, interpersonal similarity is a form of social distance: previous studies have found similar people are perceived as being socially closer to oneself than dissimilar ones, who are associated with social distance (Liviatan, Trope, & Liberman, 2008).

Venezuelan diasporas are socially, spatially, and temporally distant from their homeland. The absence of relatives and friends leads to social distance. The fact that they are far from their homeland indicates spatial distance, and the fact that time has passed since their childhood leads to temporal distance. In turn, distance can evoke a longing for diaspora homeland brands, products, services, and forms of entertainment.

The CLT states that psychological distance changes people's mental representations of events (Liviatan et al., 2008). Differences in cultural dimensions are a form of social distance. The more similar someone is to others, the more socially near they seem. The opposite is when people in one social group feel they cannot relate to another group; in this case, a diaspora would perceive a greater psychological distance from people both in their homeland and their host country (Liviatan et al., 2008).

Hofstede (2019) defines culture "as the collective mental programming of the human mind which distinguishes one group of people from another" (p. 6), meaning that cultural differences between a diaspora's homeland and the host country should create social distance, as indicated by the CLT. The three psychological distances: social, spatial, and temporal, are associated with the decision to purchase nostalgic products (Heinberg et al., 2019). Emotional brand attachment refers to the affective connection consumers form with brands, and this corresponds to the social aspect of the CLT (Heinberg et al., 2019). As a result, social distance is associated with a preference to consume nostalgic products (Heinberg et al., 2019).

The cultural dimension differences between the homeland and the host country also create a social distance for diasporas that leads to a preference to consume nostalgic products. Social distance results when the host country possesses a higher level of individualism than the diaspora homeland, because in collectivist societies people belong to tightly-knit in-groups that take care of them in exchange for loyalty, while in individualistic societies people are supposed to look after themselves (Hofstede, 2019). This can make a diaspora uncomfortable due to greater social distance, which, in turn, leads to a preference for nostalgic products. Furthermore, there is evidence that collectivist countries (like Venezuela) prefer hedonic products (Talay, Akdeniz, Obal, & Townsend, 2019) and local brands (Krautz & Hoffmann, 2017). Consequently, the following hypothesis is posited:

> H1: In host countries where individualism is higher than in the homeland, diasporas' purchases of nostalgic products are greater than they are in host countries where individualism is equal to that of the homeland.

Likewise, when there is a difference between the diaspora's homeland and the host country in terms of the cultural dimension of masculinity, increased social distance may be felt. High levels of masculinity indicate that a society is driven by competition, achievement, and success, while high levels of femininity mean that the dominant value in society is caring for others, that quality of life is an important sign of success, and that standing out from the crowd is not admirable (Hofstede, 2019). We suggest that diasporas from countries that are high in masculinity living in a feminine country might tend to consume products from their homeland as a sign of success. For people from a masculine country like Venezuela, success and recognition are an inherent part of societal norms (Hofstede, 2019). For masculine groups, buying expensive products and the latest fashions in different specialty stores is a way of showing success and status (Kumar & Pansari, 2016). Nostalgic evocation through

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traditional homeland cuisine can establish a social connection (Holak, 2014), so buying nostalgic products will signal success because they are imported and expensive, and the consumption of foreign products is a proxy for success (Talay, Townsend, & Yeniyurt, 2015). Hence, the following hypothesis is posited:

> H2: In host countries where masculinity is lower than in the homeland, diasporas' purchases of nostalgic products are greater than they are in host countries with masculinity equal to that of the homeland.

Newcomers still need to find ways to generate enough income to attend to their basic needs, such as food, housing, healthcare, and education. Despite their common Spanish heritage, Latin American countries have different levels of economic development (Vassolo, Castro, & Gomez-Mejia, 2011).

A country's economic development (ED) influences all its economic agents. Lower ED means firms will have fewer clients, fewer distribution channels, less infrastructure, fewer business opportunities, and higher risks that influence the decisions taken by Latin American people (Palomino-Tamayo, Timana, & Cerviño, 2020). A country's ED also influences consumer brand decisions and brand performance (Talay et al., 2015). Lower economic development in Latin American countries is characterized by a lack of employment and increased difficulty in finding work, and people then resort to informal jobs to survive (Vassolo et al., 2011). This lower ED context creates personal economic hardship, sparks animosity toward buying foreign products (host country products) and results in a preference for group-related products (Leonidou, Kvasova, Christodoulides, & Tokar, 2019). This animosity consequently creates a social distance of belongingness among Venezuelan diasporas, which leads to a preference to consume nostalgic products, as CLT predicts. Thus, the following hypothesis is posited:

> H3: In host countries with lesser (greater) economic development than the homeland, diasporas' purchases of nostalgic products are greater (less) than they are in those host countries in which economic development is higher (lower) than in the homeland.

Geographic proximity lowers transportation and communication costs and facilitates personal interaction, the exchange of information, and international trade (Ghemawat, 2001). Greater geographic distance between the home and the host country increases spatial distance, which distorts perceptions (Choi & Yeniyurt, 2015), causing a feeling of homesickness, which members of the diaspora try to assuage by consuming nostalgic products (Heinberg et al., 2019). Therefore, diasporas in countries that are geographically distant from their homeland tend to seek to consume nostalgic products to a greater degree. Consequently, the following hypothesis is posited:

> H4: In host countries at a greater geographic distance from the homeland, diasporas' purchases of nostalgic products are greater than they are in geographically less distant host countries.

METHODOLOGY

Data source and sample

On social media platforms like Facebook, Twitter, and Instagram, users can follow other users, comment on their posts, and track the "likes" and comments their own posts receive. While Facebook and Twitter do incorporate images, users also rely heavily on text, shared posts, and other types of non-imaged interactions. Images dominate on Instagram, however, and its users rely on "likes" as the primary means of interaction and communication (Schmeichel, Kerr, & Linder, 2020).

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Instagram's exclusive focus on images differentiates it from other platforms and is the reason Instagram was chosen as the data source for this research. The use of photographs and images means that one of the frequently recurring subjects is the relationship between Instagram and nostalgia. Several authors attribute this relationship between Instagram and nostalgia to the esthetics of Instagram's filters, which can easily reproduce a combination of film textures, framing formats, tones, patinas, and vintage effects, including warm colors and the square format of Kodak and Polaroid cameras, color tinting, and border formats reminiscent of analog technology (Wagner, 2018). In summary, Instagram is the most suitable platform for studying nostalgia.

Equally important, and in contrast to Facebook, it is common for users on Instagram to follow, view, like, and comment on photos of people they do not know personally. But the number of strangers followed and higher posting frequency are associated with depression (Reece & Danforth, 2017), and due to the acculturation processes that diasporas experience, depression is common among them (Brown, 1980). Instagram's association with depression makes it an appropriate data source for this study.

Many people in the Venezuelan diaspora on Instagram often look for information about immigration status and view Venezuelan-oriented advertising (see Table 2). The Instagram profiles shown in Table 2 were selected because they have the largest number of followers in each host country and have advertising posts that can be analyzed.

Table 2. **Online Venezuelan diaspora communities by country**

COUNTRY	INSTAGRAM SOCIAL NETWORK	FOLLOWERS	LINK
COLOMBIA	Tu Pana en Colombia	72.2 k	https://www.instagram.com/tupanaencolombia/
PERU	Peruzuela	150 k	https://www.instagram.com/peruzuela/?hl=es-la
CHILE	Venezolanos en Chile	411 k	https://www.instagram.com/venezolanosenchile/
ECUADOR	Venezolanos En Ecuador	21.8 k	https://www.instagram.com/venezolanosenecuadoroficial/?hl=es-la
PANAMA	Panazolanos	39.7 k	https://www.instagram.com/panazolanos/?hl=es-la

Measurements

As explained in the literature review, e-WOM likes are a powerful metric affecting sales (Rosario et al., 2016). Thus, this study considers the number of likes of advertising posts to be a measure of e-WOM among online Venezuelan Instagram communities in Colombia, Peru, Chile, Ecuador, and Panama.

Hofstede's indices were used (Hofstede, 2019) for measuring cultural dimensions. To classify each host country using the masculinity/femininity and individualism dimensions, cultural distance (CD) was used (Kogut & Singh, 1988). In this case, it was only used for classification purposes, with only one dimension per grouping. The CD between the host country and Venezuela shows if the country is higher or lower than Venezuela in the cultural dimension. Hofstede's cultural model was used in this research because it is appropriate at the country level, according to the seminal author. Schwartz's model is defined for the individual level, which is not the case in this study (for further discussion, see Fischer, Vauclair, Fontaine, & Schwartz, 2010).

To measure economic development distance, the percentage difference in the 2018 GDP per capita between Venezuela and the host country was used (Palomino-Tamayo et al., 2020). The source of the GDP per capita information was the central bank of each country.

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Finally, to measure geographic distance, the distance between the capital city of Venezuela and the capital city of the host country was used, in terms of their geographic coordinates as recorded in the GeoDist database, CEPII (2019).

A total sample was obtained of 44 advertising posts in Colombia, 40 in Peru, 40 in Chile, 84 in Ecuador, and 50 in Panama, from a search run from May to October 2019. The final sample was 258 ads, which received 30,785 e-WOMs (averaging 119 e-WOMs per ad). Two researchers reviewed all of the advertising posts and classified them into ten different categories. The researchers were marketing professors with knowledge of advertising. They were not otherwise involved in this study and in order to avoid bias they had no previous information about the study's title, objectives, or hypotheses. Ads were easily classified because of the graphic nature of Instagram ads and the directness of the accompanying text. The researchers and authors defined the category names and consolidated all services into only one category, "services related to Venezuela," because of the broad types of service found. One of the researchers divided the "help wanted" category into two sub-categories: "specialized help wanted" and "general help wanted." In other words, after agreeing on the category names, the second researcher split the first researcher's single category into two sub-categories. The main difference between the researchers' classification was the names they assigned to the categories, but because they were very similar, it was not hard to come to an agreement in the end.

A second review was then conducted to categorize the ads as either "nostalgic" or "economic". When the authors disagreed on the classification, they reviewed the ad in order to come to an agreement. The nostalgic products and services related to the homeland that were the main focus of the study included Venezuelan food (*arepas*, *tamales*, chocolates, ham bread, etc.), Venezuelan entertainment (parties or concerts with Venezuelan music and artists), services related to Venezuela (services for sending gifts and medicine to parents in Venezuela, food importation, and air or bus tickets from the host country to Venezuela), and money transfer (due to the Venezuelan government's restrictions, these services offered to send remittances to relatives in Venezuelan currency). Economic products included help wanted ads (ads placed by employment agencies; ads for job fairs targeting Venezuelans; and general help wanted ads for manual labor, sales, and administrative positions that did not require any previous training), specialized help wanted ads (help wanted ads looking for technicians and professionals, such as electricians, barbers, bakers, and engineers with some degree of specialization and experience), ads for educational opportunities (technical courses or programs to obtain host country certifications), ads for basic consumer products (computers, mobile phones, over-the-counter medicines), and ads for financial services (mortgages and loans for vehicle purchases).

RESULTS

Three of the ten identified advertising categories received the majority of the likes: Venezuelan entertainment, Venezuelan food, and help wanted ads, but varied somewhat depending on the host country. Table 3 displays the e-WOM descriptive statistics for each ad category and summarizes the e-WOM behavior of the Venezuelan diaspora. Ads for Venezuelan entertainment generated the most e-WOM in Peru, mean=255(SD=252) and Ecuador, mean=124(SD=159). They were also important in Panama, mean=13(SD=7), Colombia, mean=104(SD=66), and Chile, mean=309(SD=141). The help wanted ads were the most important in Colombia, mean=204(SD=78), the second most important in Chile, mean=433(SD=162), and somewhat relevant in Ecuador, mean=57(SD=35) and Panama, mean=6(SD=7). Another category that generated high e-WOM across all countries was Venezuelan food, especially in Colombia, mean=149(SD=39), Peru, mean=118(SD=68), Ecuador, mean=92(SD=73), and Panama,

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mean=12(SD=10). There were some exceptional cases: in Panama, ads for education generated the most e-WOM, mean=15(SD=2), while in Chile, financial services generated the most e-WOM, mean=804(SD=478).

Table 3. **Descriptive e-WOM statistics by country and advertising category**

	MEAN	STD. DEV.	MIN	MAX
COLOMBIA				
Help Wanted	204	78	110	315
Venezuelan Food	148	59	65	226
Venezuelan Entertainment	104	66	51	178
Work Consulting	44	14	28	70
Services Related to Venezuela	36	11	20	43
Money Transfer	29	12	13	49
PERU				
Venezuelan Entertainment	255	252	24	602
Education	142	133	32	517
Cellular Phone Gift	121	93	39	362
Venezuelan Food	117	68	41	173
Services Related to Venezuela	91	49	18	146
CHILE				
Financial Services	804	478	294	1243
Help Wanted	433	162	194	643
Venezuelan Entertainment	309	141	134	593
Services Related to Venezuela	187	81	29	274
Specialized Work	145	57	76	238
ECUADOR				
Venezuelan Entertainment	124	159	23	855
Services Related to Venezuela	94	72	15	258
Venezuelan Food	92	73	30	236
Education	58	52	4	195
Help Wanted	57	35	2	114
Specialized Work	46	15	30	66
Money Transfer	30	2	32	119
PANAMA				
Education	15	2	13	17
Venezuelan Entertainment	13	7	7	20
Venezuelan Food	12	10	2	22
Help Wanted	6	7	1	24
Basic Consumer Products	5	3	2	12
Services Related to Venezuela	4	3	1	12

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To test the hypotheses, an ANOVA and Welch's t-test were conducted, in which the dependent variable for each group of host countries was the e-WOM of the ads. First, the host countries were classified (using % CD difference) as having higher individualism than Venezuela (Peru CD=+33% and Chile CD=+92%), or individualism of a similar level to that of Venezuela (Colombia CD=+8, Ecuador CD=-33%, and Panama CD=-8%). The results indicate differences between the groups that are consistent with H1: countries with higher individualism than Venezuela, mean 205(SD=38.8), have greater e-WOM than countries with equal individualism, mean=74(SD=9.7) (see Figure 1–A). The difference is significant and positive (Mdiff=131, SDdiff=39.9, Welch's DF=39.7, t=-3.27, p<.01) and supports Hypothesis H1. As a robustness check, the estimation was run without Ecuador. The results indicated that the other countries still had about the same level of individualism (mean=43, SD=57). The difference remained significant and positive (Mdiff=162, Welch's DF=38.1, t=-4.099, p<.0001); therefore, the results remain valid.

Second, host countries were classified (using % CD difference) as being lower in the masculinity dimension (Peru=-42%, Chile=-62%, and Panama=-40%), or similar in masculinity to Venezuela (Colombia CD=-12% and Ecuador CD=-14%). Here, too, there are differences in the results (Figure 1–B) between countries with lower masculinity than Venezuela, mean=118(SD=16.2), which have greater e-WOM, and countries with equal masculinity, mean=67(SD=11.4). In the same way, the difference is significant and positive (Mdiff=51, SDdiff=19.1, Welch's DF=133.2, t=2.59, p<.01), in agreement with Hypothesis H2.

Third, to test H3, host countries were classified as countries with a higher economic development distance than Venezuela (Chile and Panama) or a lower economic development distance than Venezuela (Peru, Colombia, and Ecuador). In this case, there were very slight differences in the results (Figure 1–C). Host countries with a higher economic development distance, mean=131(SD=45.4), have e-WOM values similar to those of countries with a lower economic development distance, mean=100(SD=10.6). In this case, the difference is not significant (Mdiff=31, SDdiff=46.6, Welch's DF=-34.6, t=-0.65, p=.74), and so Hypothesis H3 is not supported.

Fourth, host countries were classified by their geographic distance from the homeland. Colombia and Panama were less geographically distant from Venezuela, while Ecuador, Peru, and Chile were more geographically distant. Host countries at a greater geographic distance, mean=144(SD=18.9), had higher e-WOM values (see Figure 1–D) than host countries that were closer, mean=43(SD=7). The difference was significant and positive (Mdiff=101, SDdiff=20.5, Welch's DF=118.7, t=4.92, p<.001), so Hypothesis H4 is supported.

Finally, the ATE of the population was estimated (Table 4) based on a direct comparison between treatment and control diaspora groups that received different levels of observationally matched treatment; such a comparison can be interpreted causally (Imbens & Rubin, 2015). First, the treatment effect for diaspora groups in countries with high individualism was estimated using the e-WOM metric, and masculinity, economic development distance, and geographic distance were used as co-variables. The result shows a significant and positive treatment effect for host countries with high individualism (ATE=70, z=2.62, p=.009). Then, when the group of host countries with lower levels of masculinity was placed in the treatment group and the equally masculine host countries were kept as the control group, with individualism, economic development distance and geographic distance as co-variables, there was a significant and positive effect for countries with low levels of masculinity (ATE=48, z=2.58, p=.010). Similarly, when geographic distance was the treated variable and masculinity and economic development distance were co-variables, a significant and positive effect was found for the diaspora group in a geographically more distant country (ATE=114, z=4.04, p<.001). These results are in harmony with Hypotheses H1, H2, and H4.

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Figure 1. **ANOVA results, e-WOM ads of nostalgic products from host countries**

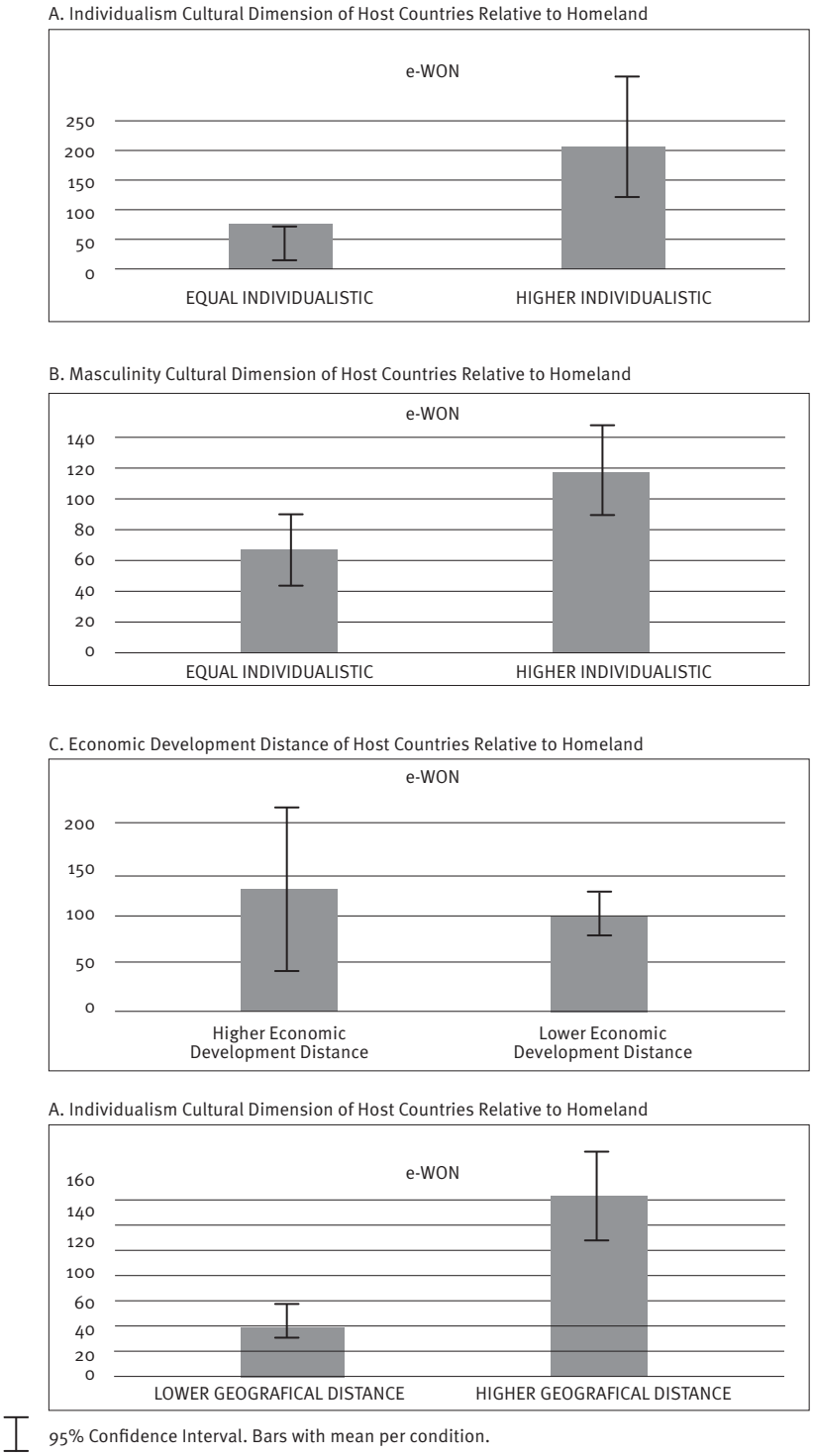

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Table 4. **Results: Average Treatment Effect (ATE) on population (e-WOM effect)**

eWOM	Coef.	Std. error	Z	p	Hypotheses
Higher Individualism vs. Equal Individualism	70	27	2,62	‹,010	H1 Supported
Equal Masculinity vs. Lower Masculinity	-48	19	-2,58	‹,010	H2 Supported
Higher Econ. Dev. vs. Lower Econ. Dev.	-.27	29	-,01	›,10	H3 Not Supported
Greater Geog. Dist. vs. Lesser Geog. Dist.	114	28	4,02	‹,001	H4 Supported

The ATE methodology can be used to interpret causal effects (Imbens & Rubin, 2015). For the diasporas in the lower economic development host country group, estimation of the treatment effect with individualism and geographic distance as the co-variables exhibits no significant effect (ATE=-.27, z=-.01, p=.993). Hence, a causal inference for Hypothesis H3 cannot be made. As mentioned, these effects are estimated for ads for nostalgic products. For diaspora groups in host countries with a greater economic development distance (with masculinity and geographic distance as the co-variables), a significant and positive treatment effect was found (ATE=123, z=3.11, p=.002).

To evaluate design validity, Gliner, Morgan, and Leech's (2011) recommendations were followed. First, a database and all data available were used. There was no observer, no observer bias, common method bias, or sample bias present. Second, the independent variables of culture and geographic distance were stable over time: no external change impacted these variables. Third, the robust results of two estimation methods (ANOVA and Welch's t-test) gave the study precedence confirmation. Fourth, the matching procedure allows for a causal interpretation instead of the mere observation of an association, without an endogenesis concern (Imbens & Rubin, 2015).

Fifth, the measurements are used, in a similar nomological context, supported by high-quality literature that provides the overall internal design with good internal validity. Finally, because the study covered five countries, it provided adequate external validity that exceeded that of previous research on the topic.

DISCUSSION

This research proves that, as CLT predicted, social distance favors immigrants' preference for products originating in the home country due to nostalgia. This contrasts with the results of previous studies, which only referred to brands being positioned as "nostalgic", but not necessarily associated with the home country (Heinberg et al., 2019). Similarly, the results show the host country's spatial distance from the homeland influences the diaspora's preference for products from its country of origin. According to the literature review and as far as can be told, no previous research has covered this topic. These results are significant because they open up market opportunities in coming years for homeland products for diasporas and for next-generation families by taking advantage of this nostalgic appeal resulting from social and spatial distance.

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CONCLUSIONS

The results offer interesting implications for the theory on international consumer behavior because they illustrate how psychological distance drives diaspora behavior in a multicountry scenario. The findings show how cultural differences (Hofstede's individualism/collectivism and masculinity/femininity dimensions) between the homeland and the host country produce social distance for the diaspora that incentivizes them to purchase nostalgic products. Using CLT, these cultural dimensions explain the influence of culture on the development of psychological distance. Prior literature, in contrast, focused mostly on how language differences created stress among diasporas. These results can be extended to include cases of intraregional migration where there are no differences in language. Venezuelan entertainment and Venezuelan food are considered to be social bonds that connect people to their homelands through nostalgia.

The results are also consistent with the CLT-based idea that geographic distance creates spatial distance. If the host country is far from the homeland, the spatial distance is greater and leads to the diaspora's consumption of more nostalgic products.

Contrary to what was argued in Hypothesis H3, the results showed that there was no preference for nostalgic products among diasporas in countries with different levels of economic development distance. This result could be because the diasporas' psychological factors are not necessarily related to the host country's economic status.

The purchase of nostalgic products and services can create demand for them that the consumer food packaging industries from the diasporas' host country can exploit, by targeting this growing segment of products and services that perhaps host country consumers might like and adopt, as well.

This research can guide the decisions of governments and international organizations for mitigating the effects of psychological distance. In fact, they could consider promoting the commercialization of homeland (in this case, Venezuelan) products to help diasporas, because migration is a social problem for the host country and a psychological one for the migrant.

Although this study contributes by elucidating diaspora behavior regarding the consumption of nostalgic products, it has its limitations. One of the limitations of this study is the online context and the use of Instagram likes as a measure. Most Venezuelan immigrants were young people, as were Instagram users in general. However, this meant that older people were not considered in the sample. It would be ideal to extend this research to involve the offline diaspora community.

Second, as Hofstede (2019) states, using cultural dimensions in an analysis "does not imply that everyone in a given society is programmed in the same way" (p. 6). As such, an examination of how the host country culture influences individual culture is a fruitful avenue for research.

As traditional literature argues, another limitation of the study is that diaspora acculturation is a process that has different psychological stages (Brown, 1980). These stages can influence diaspora consumption patterns. However, as the Venezuelan sample is a relatively new migrant community, it can be assumed that most of them are newcomers. Studying the difference in time according to the CLT could be fruitful, starting with psychological time distance (Liberman et al., 2007).

To conclude, this literature review helps distinguish between the general topic of diaspora and the more specific topic of diaspora marketing. As such, it may act as a starting point for marketing researchers to examine new ideas for future work in this emerging field of research.

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AUTHOR'S CONTRIBUTIONS

Walter Palomino-Tamayo, Maria Christina Saksanian and Otto Regalado-Pezúa declare that they participated in all stages of development of the manuscript. Dr. Walter Palomino-Tamayo worked on the conceptualization and theoretical-methodological approach. The theoretical review was conducted by Dr. Maria Christina Saksanian. Data collection was coordinated by Dr. Otto Regalado-Pezúa. Data analysis included Dr. Walter Palomino-Tamayo. Walter Palomino-Tamayo, Maria Christina Saksanian and Otto Regalado-Pezúa worked together in the writing and final revision of the manuscript.

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ARTICLES

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IS YOUR SUPPLY CHAIN READY FOR THE NEXT DISRUPTION? BUILDING RESILIENT CHAINS

Sua cadeia de suprimentos está preparada para a próxima interrupção? Construindo cadeias resilientes

¿Su cadena de suministro está preparada para la próxima disrupción? Construcción de cadenas resilientes

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ABSTRACT

The ability to recover from disruptions is important for organizations and supply chains. Empirical data were used to investigate factors that affect supply chain recovery from disruptions, including collaboration, visibility, flexibility, analytical orientation, and supply chain risk management. A literature review was conducted to build an online questionnaire that was applied to manufacturing firms in Brazil. This work's statistical method includes confirmatory factor analysis and structural equation modeling. Our results indicate that a package of resilience capabilities - collaboration, flexibility, visibility, and analytical orientation - positively affect supply chain resilience. Improving such capabilities, therefore, will allow supply chains to recover better from disruptions. It was also discovered, however, that supply chains do not recover from disruptions by way of supply chain risk management alone. Mutual impacts also exist between the group of resilience capabilities and supply chain risk management.

KEYWORDS | Supply chain resilience, resilience capabilities, supply chain risk management, recovery, structural equation modeling.

RESUMO

A habilidade em se recuperar de interrupções é um importante fator para as organizações e suas cadeias de suprimentos. Dados empíricos foram utilizados para investigar fatores que impactam a recuperação das cadeias de suprimentos em face de interrupções, como a colaboração, visibilidade, flexibilidade, orientação analítica e a gestão de riscos. Uma revisão de literatura foi conduzida para desenvolver o questionário que foi aplicado em indústrias de transformação do Brasil. Os métodos estatísticos utilizados incluem a análise fatorial confirmatória e a modelagem de equações estruturais. Os resultados indicam que o pacote de capabilidades em resiliência – colaboração, flexibilidade, visibilidade e orientação analítica - impacta positivamente a resiliência das cadeias de suprimentos. Assim, aprimorar essas capabilidades permitirá uma recuperação mais adequada de interrupções. Também se constatou que a gestão de riscos, sozinha, não favorece a recuperação de interrupções. Adicionalmente, existe um impacto mútuo entre as capabilidades em resiliência e a gestão de riscos.

PALAVRAS-CHAVE */ Resiliência em cadeias de suprimentos, capabilidades de resiliência, gestão de riscos, recuperação, modelagem de equações estruturais.*

RESUMEN

La capacidad de recuperarse de las disrupciones es un factor importante para las organizaciones y sus cadenas de suministro. Se utilizaron datos empíricos para investigar los factores que afectan la recuperación de las cadenas de suministro ante disrupciones, como la colaboración, la visibilidad, la flexibilidad, la orientación analítica y la gestión de riesgos. Se realizó una revisión de la literatura para elaborar el cuestionario que se aplicó a las industrias manufactureras en Brasil. Los métodos estadísticos utilizados incluyen el análisis factorial confirmatorio y el modelado de ecuaciones estructurales. Los resultados indican que el paquete de capabilidades de resiliencia –colaboración, flexibilidad, visibilidad y orientación analítica– afecta positivamente la resiliencia de la cadena de suministro. Por lo tanto, mejorar estas capabilidades permitirá que las cadenas de suministro se recuperen más adecuadamente de las disrupciones. También se descubrió que la gestión de riesgos por sí sola no favorece la recuperación de las disrupciones. Además, existe un impacto mutuo entre las capacidades de resiliencia y la gestión de riesgos.

PALABRAS CLAVE */ Resiliencia de la cadena de suministro, capabilidades de resiliencia, gestión de riesgos, recuperación, modelos de ecuaciones estructurales.*

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INTRODUCTION

Examples such as COVID-19, which is impacting organizations and their supply chains around the world (Cosgrove, 2020); the departure of the UK from the European Union, which led to Domino's pizza spending US$ 8.5 million on stocks of ingredients in the face of an increased risk of supply chain disruption (CNN, 2019); and the Phillips factory fire, which affected Ericsson's production (Norrman & Jansson, 2004) demonstrate how risks and uncertainties can be devastating, not only for a single organization, but also for multiple supply chains members (Ambulkar, Blackhurst, & Grawe, 2015).

Managers and scholars have been emphasizing, therefore, the need to build resilient supply chains to promote rapid recovery from disruptions (Brusset & Teller, 2017; Pettit, Croxton, & Fiksel, 2019). It is important to build resilient supply chains because of the interdependence of their members, with organizations both impacting and being impacted by internal or external disruptions. As supply chain members, therefore, organizations must develop their capabilities to become more resilient in order to help their supply chains return, to normal or improved operations after disruptions as quickly as possible, (Jüttner & Maklan, 2011; Kwak, Seo, & Mason, 2018; Pettit et al., 2019).

Some of the most extensively discussed resilience capabilities in literature up until 2016 were: collaboration (Jüttner & Maklan, 2011; Pettit, Fiksel, & Croxton, 2010; Scholten & Schilder, 2015), flexibility (Jüttner & Maklan, 2011; Ponomarov & Holcomb, 2009; Sheffi & Rice, 2005), and visibility (Brandon-Jones, Squire, Autry, & Petersen, 2014; Christopher & Peck, 2004; Scholten, Scott, & Fynes, 2014; Wieland & Wallenburg, 2013), and more recently, analytical orientation (Dubey et al., 2019; Ivanov, Dolgui, Das, & Sokolov, 2019; Oliveira & Handfield, 2019; Papadopoulos et al., 2017; Xu, Zhang, Feng, & Yang, 2020).

Other quantitative studies investigated the relationship between these resilience capabilities and supply chain resilience on an individual basis: (i) flexibility (Brusset & Teller, 2017; Mandal, Sarathy, Korasiga, Bhattacharya, & Dastidar, 2016), (ii) collaboration (Kumar & Anbanandam, 2019; Mandal et al., 2016), (iii) visibility (Brandon-Jones et al., 2014; Kumar & Anbanandam, 2019; Mandal et al., 2016), and analytical orientation (Dubey et al., 2019; Singh & Singh, 2019). We do not disagree that each capability has a positive influence on supply chain resilience, but our main argument is that these capabilities must act in synergy, and must be assembled into what we call a capability package, a single unit, that is important and needs to be in place in the supply chain as a whole. This argument is in line with Daugherty et al. (2006) and Scholten and Schilder (2015), since each capability is insufficient in itself and may sub-optimize the supply chain resilience results.

This research also presents an advance on the theoretical model first suggested by Alvarenga, Oliveira, Zanquetto-Filho and Santos (2018a), since we propose that there is a mutual impact between the package of resilience capabilities and supply chain risk management, and their joint impact on supply chain resilience. This research, therefore, aims to contribute by expanding knowledge about supply chain resilience and its antecedents based on a cycle of conceptual advances, empirical testing, and new conceptual advances (Colquitt & Zapata-Phelan, 2007).

In theory, although supply chain risk management is important for supply chain resilience, our main hypothesis here is based on the idea that the capabilities' package will have a greater positive impact. We believe that this logical and conceptual argument makes sense, and so besides proposing a theoretical model, we made an additional contribution by testing the model empirically.

From a practical point of view, if this hypothesis is true, supply chains must manage their resilient capabilities as a package, and not use each capability separately to increase their resilience. Considering the current and the

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future scenario, in which managers believe that disruptions will be more and more frequent, this would appear to be important for improving supply chain performance.

THEORETICAL CONSTRUCTION OF THE HYPOTHESES

Supply chain resilience

There is a lack of consensus about the definition of supply chain resilience, as evidenced by works by Ribeiro and Barbosa-Povoa (2018) and Wong, Lirn, Yang and Shang (2019). Views vary from those that consider supply chain resilience as being how to deal with an interruption and the subsequent moments, and those who also consider the moment before an interruption (Ali, Mahfouz, & Arisha, 2017). We define supply chain resilience as the chain's ability to recover or move to a more desirable state after a disruption occurs (Brandon-Jones et al., 2014; Christopher & Peck, 2004; Wong et al., 2019). So, in this paper, resilience is recovery. We argue that it is the resilience capabilities' package that enables the quickest return to operations (Brandon-Jones et al., 2014), or recovery from an unexpected risk event (Kwak et al., 2018). As a result, we adapted the indicators that Graeml and Peinado (2014) and Brandon-Jones et al. (2014) used to assess supply chain resilience.

According to Pettit, Fiksel, and Croxton (2010), supply chains must confront vulnerabilities by developing resilience capabilities, which are defined as the "attributes that enable the company to anticipate or recover from interruptions" (Pettit et al., 2010, p. 6). The capabilities that appear most often in supply chain resilience literature are collaboration (Jüttner & Maklan, 2011; Pettit et al., 2010; Scholten & Schilder, 2015), flexibility (Jüttner & Maklan, 2011; Ponomarov & Holcomb, 2009; Sheffi & Rice, 2005), and visibility (Brandon-Jones et al., 2014; Christopher & Peck, 2004; Scholten et al., 2014; Wieland & Wallenburg, 2013).

Package of resilience capabilities

This section details the capabilities of the package we studied, with analytical orientation being noted as a particular resilience capability. We selected various capabilities using the Knowledge Development Process Constructivist (Proknow-C) methodology (Lacerda, Ensslin, & Ensslin, 2012; Marafon, Ensslin, Lacerda, & Ensslin, 2015). Based on 72 articles indexed on the Web of Science platform, or that appeared in Ebsco, Science Direct, and Emerald over the last 30 years, with titles containing the terms "supply chain resilience" or "resilient supply chain", we identified the most often cited papers, with 21 articles representing 90% of the citations on the topic. These papers and the most current papers that were compatible with the theme were used to build a foundation for the initial model.

Collaboration

Collaboration is defined as the relationship that exists between the supply chain's focal members and that enables joint strategies, information exchange, and knowledge sharing with its primary buyers and suppliers (Barratt, 2004; Cao & Zhang, 2011).

Jüttner and Maklan's (2011) empirical study revealed that collaboration between chain members mitigates the negative impacts of disruptions. Furthermore, communication and cooperation between chain members has an impact on the resilience of the entire chain (Wieland & Wallenburg, 2013) both statistically and significantly.

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Quantitative research enabled Kumar and Anbanandam (2019) and Mandal et al. (2016) to establish that collaboration has an impact on supply chain resilience.

The advantages of elements, such as collaboration, for building a resilient supply chain become clear during situations such as the financial collapse of freight carrier, Hanjin Shipping, in 2017 when its vessels were denied entry to ports around the world, and US$14 billion in goods were abandoned. At the time, AGL Logistics, and its partner network, was able to find space for AGL customers' shipments with another carrier, which honored the original rate charged by Hanjin. Without that support, the business could have potentially waited months for clearance to dock in the United States (Roberson, 2019).

Flexibility

Supply chain flexibility relates to the chain members' ability to adjust their key processes — both internal and customer-oriented — by reacting or adapting to the environmental dynamics, and, consequently, delivering value to customers and guaranteeing the chain's profitability (Merschmann & Thonemann, 2011; Swafford, Ghosh, & Murthy, 2006, 2008). The construct in this research is operationalized as a reaction/adaptation capability in supply and delivery (Swafford et al., 2008).

A chain's flexibility enables a quick response when changes occur in supply and replenishment — such as a reduction in product development times — to then create a competitive advantage based on the chain's capacity to handle available resources, and its adaptive capacity (Sánchez & Pérez, 2005; Merschmann & Thonemann, 2011; Thomé, Scavarda, Pires, Ceryno, & Klingebiel, 2014). The plan by H&M's CEO, Karl-Johan Persson, to improve performance results by moving from fast fashion to smart retailing, has meant that the retailer will have to build in operational resilience by creating a faster, more flexible, and technology-driven supply chain (Lopez, 2018).

Flexibility promotes resilience (Ojha, Ghadge, Tiwari, & Bititci, 2018). To be considered resilient, the chain must develop the flexibility required to change either its inputs or outputs rapidly, or recognize how to bring about these changes. For example, such flexibility can be developed, among other things, by: cultivating multiple sources of supply and replenishment; developing contract flexibility; promoting risk-sharing; and improving inventory management (Pettit et al., 2010). A study of Brazil's automotive sector by Scavarda, Ceryno, Pires and Klingebiel (2015) also confirmed that flexibility results in resilience.

Visibility

Visibility is the capability that allows the focal company's visualization throughout the entire supply chain, and having a situational awareness of activity across the network and the environmental conditions in which the chain operates. More specifically, a firm can observe the inventory conditions of both its customers and suppliers (Christopher & Peck, 2004), and avoid, for example, high "whip" effects.

From the focal company's perspective, the chain's visibility can be determined by understanding visibility as a capability that can be measured and that is influenced by the quantity and quality of the information exchanged. This favors the focal company, because it allows it to visualize inventory levels and their primary customers' and suppliers' demands precisely (Barratt & Oke, 2007; Brandon-Jones et al., 2014; Caridi, Crippa, Perego, Sianesi, & Tumino, 2010; Caridi, Perego, & Tumino, 2013). The visibility measures adopted here are based on indicators developed by Brandon-Jones et al. (2014).

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Visibility also involves a positive association with agility, or how fast the chain can recover from disruptions (Brandon-Jones et al., 2014; Christopher & Peck, 2004; Namdar, Li, Sawhney, & Pradhan, 2018). Brandon-Jones et al. (2014) first quantitatively verified the positive impact of visibility on supply chain resilience. Later, Kumar and Anbanandam (2019) and Mandal et al. (2016) stressed that visibility impacts supply chain resilience.

Analytical orientation

As noted by Ladeira et al. (2016), the analytical approach involves "the extensive use of critical data and explanatory and predictive models, as well as fact-based management to guide management decisions and actions" (p. 487). The members of analytically oriented chains efficiently process data through quantitative analyses to make fact-based decisions regarding the chain's processes (Cao, Duan, & Li, 2015; Souza, 2014).

Trkman, Mccormack, Oliveira and Ladeira (2010) empirically verified that the analytical approach to a supply chain's critical processes results in a better performance. Chae, Olson, and Sheu (2014) also verified that analytical chains have an impact on chain members' performance. More specifically, data can be used to produce insights into the context of organizational decision-making (Cao et al., 2015), which favors resilience by prevention, adaptation, and efficient decision-making for dealing with disruptions. Healthcare Ready, an organization that focuses on helping the pharmaceutical industry respond to natural disasters, is using inventory-tracking technology to support predictive analytics for pharmaceutical manufacturers and distributors in their preparations for dealing with different types of disaster (Wollenhaupt, 2019).

The definitions of analytical orientation in supply chains are closely related to the capacity for collecting and analyzing information and events in both internal and external environments. Digital twins, for example, are virtual representations of real objects that are designed to optimize the operation of assets and have a strong potential for helping supply chains improve their organizational resilience (Gartner highlights 'digital twins' as an emerging organizational resilience tool, 2018; Ivanov et al., 2019).

It is understood, therefore, that the generation, processing, storage, retrieval, sharing, and application of knowledge for decision making with regard to resilience are enhanced by the use of an analytical approach (Barbosa & Vicente, 2018; Dubey et al., 2019; Ivanov et al., 2019). Consequently, the use of analytics can help with the recovery from disruptions (Dubey et al., 2019; Papadopoulos et al., 2017).

It is noteworthy that improving the set of capabilities enables improved resilience, even when considering each capability's impact on resilience, but, to the best of our knowledge, the joint impact of these capabilities has never been tested in the literature before. Based on these arguments, our first research hypothesis is:

> H1: The resilience capabilities' package has a positive impact on supply chain resilience.

Supply chain risk management

Supply chain risk management (SCRM) involves identifying, assessing, and controlling the internal and external risks that may affect a chain's performance in order to eliminate or reduce the likelihood or impact of events that may disrupt the chain members' operations (Jüttner, Peck, & Christopher, 2003; Sodhi, Son, & Tang, 2012). The present study assumes that risks have to be jointly managed with chain members, and that efficient SCRM identifies, evaluates, controls, and monitors risks (Hallikas, Karvonen, Pulkkinen, Virolainen, & Tuominen, 2004; Tummala & Schoenherr, 2011).

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Recent studies indicate that a relationship exists between SCRM and a chain's resilience (Pavlov, Ivanov, Dolgui, & Sokolov, 2018; Rajesh, 2017; Sáenz, Revilla, & Acero, 2018), because SCRM strategies run parallel to resilience objectives (Namdar et al., 2018; Zineb, Brahim, & Houdaifa, 2017). Still, Jüttner and Maklan (2011) argue that risk management provides environmental risk knowledge, thereby increasing the chain's resilience. Similarly, Colicchia, Dallari, and Melacini (2010) verified that adopting efficient risk management strategies for addressing lead-time variability also increases the chain's resilience.

If properly executed, SCRM not only reduces the vulnerabilities that may affect the organization's operations as a consequence of chain disruptions, but also prepares the organization in order to mitigate any possible risks (Norrman & Jansson, 2004). Although this article assumes that a supply chain may recover with no need for prevention as it focuses on recovery as a dimension of resilience, scientific literature has found that SCRM may have an impact on supply chain resilience. This primarily involves preventing events that may interrupt its operations, while allowing actions to develop that can restore them (Ceryno, Scavarda, Klingebiel, & Yüzgülec, 2013; Colicchia et al., 2010; Jüttner & Maklan, 2011).

H2: Supply chain risk management has a positive impact on supply chain resilience.

Relationship between the package of resilience capabilities and supply chain risk management

Risk management is also influenced by the capabilities that we addressed in previous sections. Efficient supply chain risk management involves collaborative management, flexibility, visibility, and being analytically oriented. Li, Fan, Lee and Cheng (2015) showed that the length of the relationship and trust strengthen the effectiveness of sharing risk information. Christopher and Peck (2004) pointed out that information exchange between supply chain members is a key priority for reducing risk. For more examples of the relationship between collaboration and SCRM, see Hernandez and Haddud (2018), Zineb et al. (2017), Prakash, Gautam and Soni (2018), and Durach and Machuca (2018). Studies showed that higher visibility promotes a better understanding of risks and how to mitigate them (Nooraie & Parast, 2015; Prakash et al., 2018; Urciuoli & Hintsa, 2018). Flexibility can be used to mitigate or avoid risk impacts by modifying inputs and outputs (Prakash et al., 2018; Sheffi & Rice, 2005).

The opposite effect can also be identified in Jüttner and Maklan (2011) who concluded by way of a longitudinal case study with three supply chains that risk effect-oriented actions – considering risk sharing and hedging risks by way of redundant resources – has a positive impact on resilience capabilities in terms of flexibility, visibility and collaboration. SCRM helps reduce opportunistic behavior, enables loss dispersion, develops trust, allows disruptions to be absorbed by the parties, and reduces operational supply pipelines, thus reducing lead times (Jüttner & Maklan, 2011).

Specifically with regard to SCRM and analytical capabilities, Tummala and Schoenherr (2011) argue that data management enables the gathering, storage, and retrieval of risk information, and consequently improves SCRM as a whole. Tang and Musa (2011) report that a quantitative approach to managing supply chain risks needs to be developed. On the one hand, the supply chain must develop a package of capabilities, as proposed in this study, for identifying, evaluating, and proposing mitigation strategies for managing risks properly (Alvarenga, Oliveira, Zanquetto-Filho, & Santos, 2018b), which includes the need for an analytical orientation to efficiently identify

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and measure risks, thus facilitating their proper management (Ittmann, 2015; Pettit et al., 2019). On the other, risk management can provide supply chain members with useful data, and improve their analytical orientation.

Only the individual relationships of these capabilities and supply chain risk management were tested in the literature. Here we are interested in the package of these capabilities, not in each impact, so the third research hypothesis is:

H3: A positive, mutual relationship exists between the resilience capabilities' package and supply chain risk management.

METHODOLOGY

Data were collected from August to December 2017, using an online three-block questionnaire, which was presented randomly, using a seven-point Likert-type scale from one (totally disagree) to seven (totally agree). After developing the questionnaire, we pre-tested it with ten manufacturing or supply chain management managers from manufacturing firms. Following the procedures, the questionnaire was then sent to all manufacturing organizations listed in the Federation of Industries of Minas Gerais, São Paulo, Rio de Janeiro, and Espírito Santo. Companies from Minas Gerais were contacted through the Industrial and Business Center of Minas Gerais (CIEMG), while the others through the Brazilian Publisher of Special Guides (EBGE).

The final sample had 143 complete answers from 151 in total. Using G*Power software, the necessary sample size was calculated based on two predictor constructs (the resilience capabilities' package and risk management), setting 0.15 as the effect size, a test power of 0.80, and 0.05 as the error probability. The minimum sample size found was 43 cases. The same software was used *post hoc* to calculate the ideal test power given the sample size that was obtained, and it reached an explanatory power of 99.84%.

The structural equation modeling analysis was processed using Smart-PLS software (Ringle, Wende, & Becker, 2014). According to Hair et al. (2009), structural equation modeling provides the possibility of efficiently estimating a series of separate multiple regression equations, which can all be simultaneously calculated by considering the relationships between the manifested variables and their constructs.

DATA ANALYSIS AND RESULTS

Sample description

We used number of employees to check the size of companies since, in Brazil, it is difficult to use a firm's gross revenue. Therefore, we used only this criterion. Organizations with up to 19 employees were considered to be micro-firms, those with 19 to 99 employees were considered to be small, with 100 to 499 employees were considered to be medium/average, while firms with more than 499 employees were considered to be large. See Table 1. According to the Brazilian Micro and Small Business Support Service (SEBRAE, 2016) yearbook, 98% of Brazilian manufacturing firms are micro or small. Our sample has 77% micro or small, and more medium-sized firms. Therefore, we carried out a heterogeneity test using company size for improving the reliability of our sample and improving the consistency of the results.

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Table 1. **Sample description**

Organizations' Employees			Respondent's positions			Main functions		
Category	Quantity	%	Category	Quantity	%	Category	Quantity	%
‹19	54	37.80	Chairmen	19	13.30	Manufacturing	62	43
19 - 99	56	39.20	Company officers	46	32.20	Purchasing	34	24
100 - 499	28	19.6	Managers	58	40.60	Marketing/Sales	17	12
›500	5	3.5	Assistants	8	5.60	Other	30	21
			Other	12	8.40			

Measurement model

An analysis of the constructs' internal reliability revealed that the composite reliability values were in accordance with the limits stipulated by Hair, Hult, Ringle and Sarstedt (2017), which is greater than 0.7 and less than 0.95. Regarding convergent validity — or how the indicators correlate with the other indicators in the same construct (Hair et al., 2017) — the outer loadings obtained values greater than 0.703, except for the R3 variable. Although this variable outer loading is below the cut-off point, it was considered acceptable (above 0.4) since it was both statistically significant, and exclusion would not guarantee a substantial improvement in the measurement model. Average variance extracted (AVE) also had acceptable values, greater than 0.5. The questionnaire and measurement results are shown in Table 2 below.

Table 2. **Questionnaire and measurement results**

Regarding your supply chain (your organization, main customers, and main suppliers):
Analytical orientation – Composite reliability = 0.87, Average variance extracted = 0.70.
A1 - The quantitative analysis of data directs managerial actions. (Load - 0.767)
A2 - Members use the knowledge generated from quantitative data analysis to improve chain processes. (Load - 0.879)
A3 - To support management decisions, members can process data efficiently. (Load – 0.866)
Collaboration – Composite reliability = 0.88, Average variance extracted = 0.71.
C1 - Members' opinions are generally used to improve supply processes. (Load – 0.735)
C2 - Members effectively communicate changes in their supply processes. (Load – 0.894)
C3 - Members execute plans to improve supply processes jointly. (Load - 0.891)
Flexibility – Composite reliability = 0.84, Average variance extracted = 0.64.
F1 - When necessary, members can modify the production volume capacity. (Load - 0.838)
F2 - When necessary, members can accommodate changes in the production mix. (variety of products). (Load - 0.835)
F3 - When necessary, members can reduce production time. (Load – 0.733)
Visibility – Composite reliability = 0.83, Average variance extracted = 0.63.

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Table 2. **Questionnaire and measurement results**

Concludes

Regarding your supply chain (your organization, main customers, and main suppliers):
V1 - Can accurately see information about customer demand levels. (Load – 0.807)
V2 - Can accurately view information about customer stock levels. (Load – 0.856)
V3 - Can accurately view information about vendor stock levels. (Load – 0.714)
Supply chain risk management – Composite reliability = 0.92, Average variance extracted = 0.74.
S1 - It has formal processes to identify risks. (Load - 0.799)
S2 - Can minimize the impact of risks. (Load - 0.838)
S3 - Risks are often assessed by members of the chain. (Load – 0.919)
S4 - Risks are often monitored by members of the chain. (Load – 0.891)
Supply chain resilience – Composite reliability = 0.81, Average variance extracted = 0.60.
R1 - Can quickly recover material flow in case of interruptions. (Load - 0.845)
R2 - Can easily return to its original state in case of interruptions. (Load - 0.856)
R3 - Can develop useful knowledge from interruptions. (Load - 0.603)

Discriminant validity was verified using the Fornell-Lacker analysis (Table 3). The purpose was to verify whether the respondents perceived the study's constructs differently (Hair et al., 2017). We subsequently observed that the square-root of the construct's AVE is greater than the construct's correlation with the model's other constructs. The results demonstrate that the constructs can be considered unique, and each construct is capturing a different phenomenon.

Table 3. **Fornell-Lacker analysis**

Construct	Collaboration	Flexibility	SCRM	Analytical orientation	SCRES	Visibility
Collaboration	**0.843**					
Flexibility	0.549	**0.803**				
SCRM	0.458	0.325	**0.863**			
Analytical orientation	0.570	0.358	0.556	**0.839**		
SCRES	0.350	0.379	0.294	0.133	**0.777**	
Visibility	0.304	0.192	0.263	0.341	0.231	0.794

Hierarchical model results

The model results after executing a bootstrapping procedure with 5,000 subsamples (Table 4) statistically confirm that collaboration, flexibility, visibility, and analytical orientation are components of the resilience capabilities' package, as all p-values were less than 0.05, thus corroborating previous theoretically developed arguments. We can observe that the collaboration capability has demonstrated the greatest relevance in package of resilience capabilities formation, followed by analytical orientation.

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Table 4. **Second-Order construct measurement model**

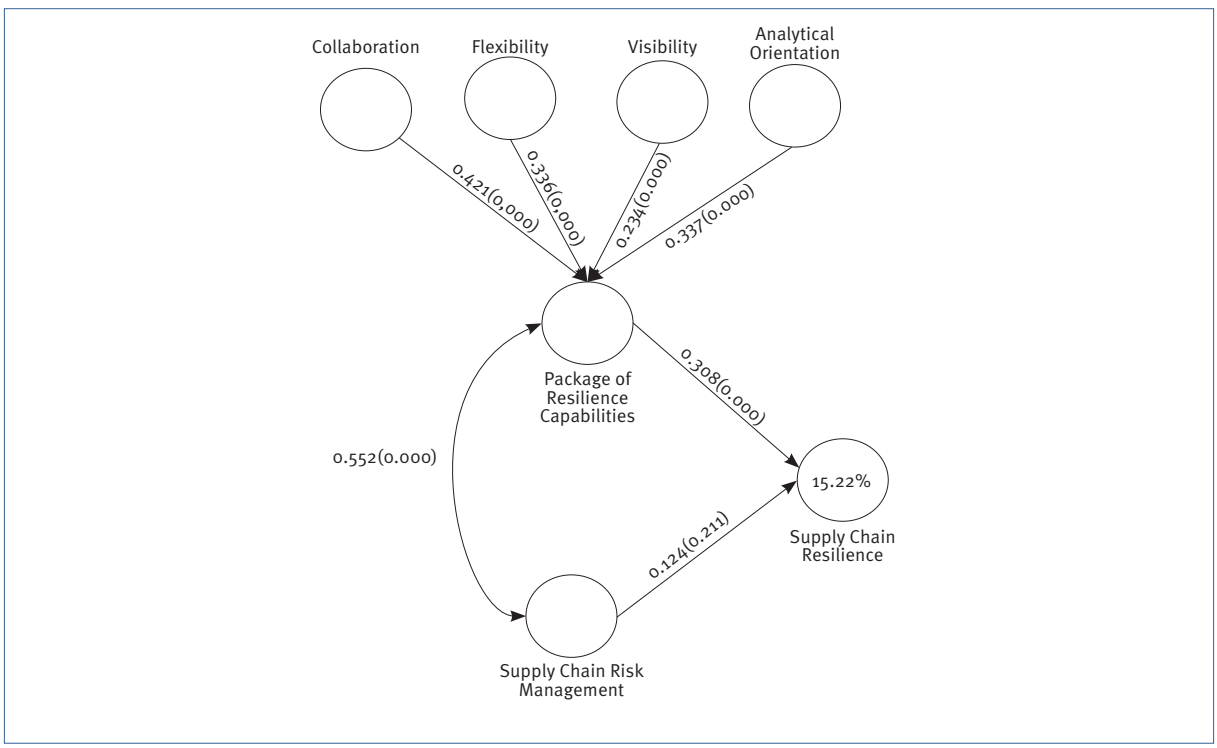
Latent Variable (Second-Order)	First-Order Construct	Collinearity	Indicators' Significance and Relevance	
		VIF	Weight	*p*-value
		< 5	-	< 0.05
Package of Resilience Capabilities	Collaboration	1.884	0.421	5.684E-14
	Flexibility	1.437	0.336	5.684E-14
	Visibility	1.155	0.234	5.684E-14
	Analytical Orientation	1.559	0.337	6.859E-08

Structural model

The structural model was assessed by inspecting each regression's results. As it is not possible to test a two-handed arrow in SmartPLS, the mutual relationships were determined by testing the Pearson correlation coefficient against the latent variable scores. After executing a bootstrapping procedure with 5,000 subsamples, and the Pearson correlation test, Figure 1 illustrates the model's results, with the numbers in parentheses delineating the relationship α. It should be noted that no collinearity exists between the predictive constructs, as the variance inflation factor was 1.455.

The path coefficient values and α confirm Hypotheses H1 and H3. Hypothesis H2, however, was rejected. The results also demonstrate that 15.22% of the variation in supply chain resilience comes from variations in the resilience capabilities' package and SCRM. Although this can be interpreted as weak, it is significant, and it is relevant that there are many other factors that the present study did not address that may also have an impact on supply chain resilience.

Figure 1. The proposed model results



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DISCUSSION

Managerial implications

In practice, the results indicate that supply chain members should seek greater collaboration, visibility, flexibility, and analytical orientation in their supply chain processes if they wish to avoid the collapse of their operations when their supply chains are disrupted. We found that SCRM has a synergistic effect with resilience capabilities, but does not directly affect resilience itself. In other words, our argument is that supply chain risk management helps with prevention, but when it comes to a disruptive event, the remedy is found in the resilience capabilities' package, so supply chain managers need to ensure the robustness of their resilience capabilities. As resilience capabilities work together, an analysis of the level of the capabilities may show managers where to invest to ensure better resilience results.

To improve their visibility, organizations must invest in obtaining information about events, resources, production, process status, and future partners' plans (Caridi et al., 2010). Promoting collaboration between chain members, therefore, plays a fundamental role in achieving better results in terms of visibility (Holcomb, Ponomarov, & Manrodt, 2011). The information obtained, however, must be useful, reliable, and received at the right time for decision-making (Barratt & Oke, 2007; Brandon-Jones et al., 2014; Caridi, Moretto, Perego, & Tumino, 2014; Oliveira & Handfield, 2019).

Chains require that any information generated and obtained through collaboration between members be processed to achieve greater visibility, transparency, and real-time information (Oliveira & Handfield, 2019; Zhu, Song, Hazen, Lee, & Cegielski, 2016). We suggest, therefore, investing in information systems and technologies that enable proper information sharing and processing (Barratt & Oke, 2007; Brandon-Jones et al., 2014; Caridi et al., 2014). As Kirchoff (2019) pointed out, "new technologies such as blockchain show a promise of better connect members of the supply chain and improve trust and transparency" (p.1) .

To improve collaboration, the focal company and its main customers and suppliers, must develop key factors, such as information exchange, trust, personal interactions, and joint planning (Kohli & Jensen, 2010). Investment in technologies like those mentioned above might promote a greater level of chain integration, resulting in new opportunities for process improvement (Bronzo et al., 2013; Vanpoucke, Vereecke, & Wetzels, 2014).

An analytical orientation facilitates the identification of changes in consumer behavior, opportunities for developing new products and new markets, and for absorbing external information (Teo, Nishant, & Koh, 2016); in other words, greater flexibility. Aiming to improve their analytical orientation, chains should have the right decision support systems available at the right time, so qualified people can take advantage of the data produced (Davenport, Harris, Long, & Jacobson, 2001; Laursen & Thorlund, 2010). As Srinivasan and Swink (2018) pointed out, visibility and flexibility are complementary to analytics. Visibility promotes data for analytics, and the insights generated through analytics can only be put into practice properly if supply chain members have some degree of flexibility (Srinivasan & Swink, 2018).

Since not all risks can be avoided, the research results do not imply that organizations should adopt a reactive stance to risk management, but they should point out solutions when events that have not been identified or adequately managed result in interruptions. Therefore, the risk management steps of (1) risk identification, (2) risk assessment, (3) risk control, 4) risk monitoring (Aqlan & Lam, 2015; Tummala & Schoenherr, 2011) are still vital to the survival and prosperity of supply chains.

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Theoretical implications

First, this study questioned the components of resilience, both theoretically and empirically. It empirically verified that supply chain members effectively prevent disruptions by managing risks, but they are not necessarily effective in independently recovering (resilience), as this study did not confirm the direct impact of SCRM on resilience. Therefore, the research contests the assertion that prevention, which theoretically relates to risk management, is not a dimension or a direct antecedent of supply chain resilience.

Furthermore, all of the most researched resilience capabilities were grouped into a package, since it is the combination of these capabilities that increases supply chain resilience. To the best of our knowledge, this has never been tested in literature until now. As we argued in the managerial implications, one capability is complementary to another, meaning that the full power of their development can only be achieved by developing them together.

This study's primary theoretical contribution involved developing and testing a theoretical model that includes analytical orientation as a resilience capability component of the resilient capabilities' package. This also has never been previously tested and , along with the other proposed capabilities, proved to be capable of explaining the supply chain resilience of manufacturing industries in southeastern Brazil. The individual impact of analytics on supply chain resilience has been previously shown in Dubey et al. (2019) and Singh and Singh (2019).

CONCLUSIONS

Based on the fact that supply chain risks and uncertainties can cause devastating disruptions to their members, this article aimed to present empirical evidence that can be used to drive efforts in a quest for improving supply chain resilience when facing disruptive events and global threats, such as the COVID-19 pandemic. We argue that to be resilient, supply chains must exert their efforts to develop a resilience capabilities' package, which includes collaboration, flexibility, visibility, and an analytical orientation.

By way of an empirical study of manufacturing firms in Brazil, this paper addresses a relevant supply chain management topic. It analyzes the impact of a package of resilience capabilities on supply chain resilience, instead of the isolated influences of these capabilities. Using a statistical method, including confirmatory factor analysis and structural equation modeling, we were able to test the research hypotheses. First, this paper presents a resilience capabilities' package that was validated by the hierarchical model results, including analytical orientation as a part of this package. Second, based on structural model results, we were able to confirm the first hypothesis "H1: The resilience capabilities package has a positive impact on supply chain resilience" and "H3: A positive, mutual relationship exists between the resilience capabilities' package and supply chain risk management", and reject "H2: Supply chain risk management has a positive impact on supply chain resilience". The hypothesis results enabled to validate the proposed theorical model by an empirical test.

More specifically, our research provides a better interpretation of the supply chain resilience construct, and verified whether collaboration, flexibility, visibility, and analytical orientation are components of a resilience capabilities' package; it confirmed not only if this package impacts SCRM, but also if SCRM has an impact on the resilience capabilities' package. The results indicated that this package results in an easier and quicker way for supply chains to return to their previous condition after disruptions occur, or to evolve to a better, more desirable condition; in other words, collaborative, flexible, visible, and analytical supply chains are more resilient. It is this

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set of capabilities that makes chains more resilient, because the absence of one of these capabilities leads to a sub-optimization of the resilience result.

Our findings suggest that SCRM does not directly affect supply chain resilience. One theoretical explanation for this finding is that prevention does not remedy disruptions in a company that needs help to recover. Alternatively, organizations could jointly develop capabilities such as collaboration, visibility, flexibility, and analytical orientation, but since other studies suggest prevention as a dimension of supply chain resilience (Pavlov et al., 2018; Rajesh, 2017; Sáenz et al., 2018), this is theoretically doubtful. Consequently, a question arises from this study: Can prevention make firms more resilient, or is prevention a necessary, but insufficient condition for resilience?

Since we are currently going through an unprecedented global interruption connected with the COVID-19, future studies can investigate what additional capabilities might have helped minimize the impact of the virus in supply chains; in other words, what are the differences between the supply chains that were more or less impacted? Future studies might also look for lessons in the memory of supply chains, which can be used to avoid a future global crisis, or to recover from one faster.

Testing the model outside Brazil in different cultures and settings would also be worth considering. It might also be interesting to investigate how the structure of the SC impacts capabilities, e.g., how might collaboration be developed under different structural supply chain arrangements and its impact on resilience results.

Finally, we suggest that future research should investigate other capabilities that might also explain supply chain recovery, like safety and security. While supply chain "digitization" can result in countless benefits, as was argued throughout the article, this "digitization" also poses other risks for supply chains, and in this respect cybersecurity concerns are emerging as an increasingly relevant research topic in the field of supply chain resilience.

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AUTHOR'S CONTRIBUTIONS

Murilo Zamboni Alvarenga, Marcos Paulo Valadares de Oliveira and, Hélio Zanquetto Filho worked on the conceptualization and theoretical-methodological approach. The theoretical review has contributions from all authors. Data collection was coordinated by Marcos Paulo Valadares de Oliveira and Hélio Zanquetto Filho, and conducted by Murilo Zamboni Alvarenga. Data analysis included Murilo Zamboni Alvarenga and was assisted by Marcos Paulo Valadares de Oliveira and Hélio Zanquetto Filho. Murilo Zamboni Alvarenga, Marcos Paulo Valadares de Oliveira, Hélio Zanquetto Filho, Kevin C. Desouza, Paula Santos Ceryno worked together in the writing and final revision of the manuscript.

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MARKET REACTION TO THE TONES OF EARNINGS CONFERENCE CALLS

Reação do mercado acionário aos tons transcritos das teleconferências de resultados

Reacción del mercado accionario a los tonos transcritos de las teleconferencias de resultados

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ABSTRACT

This study analyzes the different tones used by the participants in earnings conference calls and the influence on the generation of abnormal stock returns. This study fills the research gap of the segregation of tone analysis by type of analyst and corporate administratives during earnings conference calls. The sample covered the period from 2010 to 2017, totaling 1165 earnings conference calls transcripts from 44 Brazilian companies listed in B3 - Brasil, Bolsa, Balcão. The main finding is that the transcribed tone and words based on the Loughran & McDonald (2011) dictionary, have significant predictive power over stock market reactions after earnings conference calls.

KEYWORDS | Earnings conference calls, tone, abnormal return, buy-side and sell-side analysts, corporate representatives.

RESUMO

Este estudo tem como objetivo analisar os diferentes tons transcritos utilizados pelos participantes nas teleconferências de resultados e sua influência na geração de retornos anormais das ações. Este estudo preenche uma lacuna de pesquisa que é a segregação da análise do tom por tipo de analista e de representantes corporativos durante a teleconferência de resultados. A amostra abrangeu o período de 2010 a 2017, totalizando 1.165 transcrições de teleconferências de resultados de 44 empresas brasileiras listadas na B3 – Brasil, Bolsa, Balcão. O principal achado é que o tom transcrito e as palavras utilizadas com base no dicionário de Loughran e McDonald (2011) têm poder de previsão significativo sobre as reações do mercado de ações após as teleconferências de resultados.

PALAVRAS-CHAVE */ Teleconferências de resultados, tom, retorno anormal, analistas buy-side e sell-side, representantes corporativos.*

RESUMEN

Este estudio tiene como objetivo analizar los diferentes tonos transcritos utilizados por los participantes en las teleconferencias de resultados y su influencia en la generación de retornos anormales de acciones. Este estudio llena un vacío de investigación que es la segregación del análisis del tono por tipo de analista y representante corporativo durante la teleconferencia de resultados. La muestra abarcó el período comprendido entre 2010 y 2017, totalizando 1165 transcripciones de teleconferencias de resultados de 44 empresas brasileñas cotizadas en la B3 - Brasil, Bolsa, Balcão. El principal hallazgo es que el tono transcrito y las palabras usadas según el diccionario de Loughran y McDonald (2011) tienen un poder predictivo significativo sobre las reacciones del mercado de valores después de las teleconferencias de resultados.

PALABRAS CLAVE */ Teleconferencias de resultados, tono, retorno anormal, analistas buy-side y sell-side, representantes corporativos.*

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INTRODUCTION

Companies issue mandatory reports and a series of voluntary information to comply with market regulations, and investors use these data in decision-making processes. More voluntary disclosure reduces risk, informational asymmetry, and the cost of capital and increases organizational transparency and market liquidity (Beyer, Cohen, Lys, & Walther, 2010). Thus, the information of accounting reports extrapolates the numbers expressed in financial statements (Chin, Chen, & Liang, 2013; Frankel, Johnson, & Skinner, 1999; Kearney & Liu, 2014) and is expressed through written, spoken, or body language during earnings conference calls.

Among the main research findings in the literature, it is worth noting that, in US companies, corporate representatives use a more positive tone in their speech, compared to financial analysts (Brockman, Li, & Price, 2015). In turn, the stock market reacts more strongly to the discourse of financial analysts than to managers or representatives (Brockman et al., 2015). In other jurisdictions, such as Hong Kong, market participants react more to company tone than analyst tone, contrary to the results found in research on US companies (Brockman, Li, & Price, 2017).

Earnings conference calls are interactive (Chan, Lee, Petaibanlue, & Tan, 2017) and provide ease of transferring information from management to investors (Brockman et al., 2017). As the earnings calls are interactive, participants can ask questions related to their concerns (Tasker, 1998), express opinions, confirm inferences (Palmieri, Rocci, & Kudrautsava, 2015), or discuss issues that were not clarified in the financial reports (Bassemir, Novotny-Farkas, & Pachta, 2013).

During earnings calls, corporate representatives and analysts share their expectations about the company's financial performance. In this context, managers can influence analyst expectations and decision-making (Black, 2016), but the interpretation of the information the company provides may differ between buy-side and sell-side analysts (Yamamoto & Hirata, 2012).

The way information is transmitted can affect stock market performance; the tone observed in the transcription of earnings calls directly correlates with the reaction of investors in the stock market (Kang, Park, & Han, 2018). By evaluating the tone of each of the call's main participants, it is possible to capture their influence on fluctuations in stock returns. Thus, in addition to identifying the different tones of company managers and financial analysts, it is possible to identify which intervening parties have the most significant effect on stock returns.

This study analyzes the transcription of earnings conference calls, examining the tones used by different participants and their influence on the behavior of stock returns in terms of generating abnormal returns. The research intends to fill a gap in the literature by segregating the study of the tone adopted by the type of analysts (buy-side and sell-side) and corporate representatives (Chief Executive Officer [CEO]; Chief Financial Officer [CFO], or Investor Relations [IR]) during earnings conference calls.

Earnings calls have specific argumentative structures, in which a set of particular words can lead to an interpretation (positive or negative) of the quantitative information. The tone of the financial narrative can be assessed using a word dictionary (Henry & Leone, 2016). In this study, we intend to use the word lists elaborated by Loughran and McDonald (2011), creating an index that expresses the tone of Brazilian companies' managers and analysts. The buy-and-hold abnormal return (BHAR) is used to calculate abnormal returns to evaluate the influence of tone on the financial market

An important contribution of this study is the spatial cut of the analysis, which assesses the tone adopted in the earnings calls in Brazil, in contrast with the main studies, which have been conducted in North American companies (Blau, DeLisle, & Price, 2015; Brockman et al., 2015; Doran, Peterson, & Price, 2012; Henry & Leone, 2016; Palmieri et al., 2015). Brazil's stock exchange B3 (Brasil, Bolsa, Balcão) is one of the largest of the world in market capitalization, a position achieved due to institutional changes that allowed to improve governance and risk management mechanisms, and the merger of stock, commodities, and futures exchanges.

Thus, as noted by Chan et al. (2017), studies of other countries point to different degrees of incentive for voluntary disclosure, affecting the reports' quality and transparency. Voluntary disclosure allows managers to increase their transparency to the stock market, reducing both risk and cost of capital, positively affecting stock prices and liquidity (Beyer et al., 2010).

In turn, studies on voluntary disclosure are subdivided into quantitative and qualitative research (Pagliarussi, Aguiar, & Galdi, 2016). The quantitative approach has received more attention in the literature, mainly based on evaluating accounting numbers, macroeconomic indicators, industry productivity, and other aspects. Qualitative analysis, which is the focus of this study, contributes to understanding the influence of textual information on investment decisions.

Studies that treat the qualitative aspect of voluntary disclosure typically test whether the tone (feeling) of the narrative has incremental information and examine the factors that give rise to cross-cutting differences in disclosure (Henry & Leone, 2016). The tone is characterized as a form of articulation of human speech, whether in spoken, written, or visual form. Language, written and oral, is how companies communicate much information about their past and project their future performance (Hales, Kuang, & Venkataraman, 2011).

The information generated and disseminated during earnings calls can cause variations in the earnings and number of shares traded. Under the efficient-market hypothesis, market participants must react promptly to company-specific information (Blau et al., 2015). However, the tone used in the disclosure reports can lead to incorrect interpretation by agents, as they contain opinions veiled by positive or negative tones about market predictions. In addition, analysts and investors make capital market investment decisions based on what managers choose to discuss and disclose in earnings calls (Black, Christensen, Kiosse, & Steffen, 2013).

In short, to contribute to the literature on accounting disclosure, we brought the following objects of study: a) the tone in spoken words, not in written reports; b) voluntary disclosure documents, such as earnings conference calls, rather than regular company documents; c) the interaction between the corporate representatives' tones (CEO, CFO, and IR, also referred to as "managers"), and financial analysts' tones (buy-side and sell-side); and d) the effect of the tone observed from different interveners in a less developed market, as is the case of Brazilian companies.

From a sample of 1,165 transcripts of earnings calls from the results of 44 companies listed on B3 in the period 2010 to 2017, we found that the tone and the words used based on the dictionary by Loughran and McDonald (2011) have significant predictive power on stock market reactions. The research contributes to the literature by analyzing the differences in tone between corporate representatives/managers (CEO, CFO, and IR) and analysts (sell-side and buy-side) and separating positive and negative words to help better understand the behavior of stock returns after earnings conference calls.

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THEORETICAL FRAMEWORK

Earnings conference calls have become a common mechanism for voluntary disclosure in the capital market (Baik & Nam, 2009). Managers and analysts use this type of corporate communication to exchange information or share it with other participants in the stock market (Borochin, Cicon, DeLisle, & Price, 2018). Voluntary communication during earnings calls, especially when company executives make presentations to investors, conveys important information to the market (Bushee, Jung, & Miller, 2011). Therefore, the form in which the market's reaction to such calls is an important issue for the economy, with substantial consequences (Borochin et al., 2018).

The earnings calls are conducted by corporate leaders with financial analysts immediately following the announcement of quarterly results. Participants fall into three distinct categories: a) corporate representatives (CEO, CFO, or IR); b) financial analysts and investors, in particular, those who regularly monitor the company and actively participate by asking questions. They are divided into buy-side analysts (analysts and investment fund managers) and sell-side analysts (professionals from banks and stockbrokers); and c) the operator who conducts the calls (Palmieri et al., 2015).

These conference calls are divided into two parts, a presentation for corporate representatives and a questions and answers (Q&A) session. The interaction between different agents occurs mainly during the Q&A when financial analysts ask questions, which corporate representatives answer immediately (Camiciottoli, 2011). Thus, it is possible to assess the positioning, the performance, and the influence of managers and analysts, isolating the impact of each of these agents in the tone expressed during the call (Brockman et al., 2015).

Studies on the tone of earnings calls have focused on the overall tones of corporate representatives and financial analysts (Brockman et al., 2015, 2017; Henry & Leone, 2016; Loughran & McDonald, 2016). However, there is much to learn about general interaction patterns and how the company stocks will behave afterward. The interactive process of earnings calls is dynamic, different from the static process of the annual reports disclosure, press releases, and news articles, among others (Blau et al., 2015).

In a textual analysis of earnings conference calls, Lee (2016) developed measures to capture the differences in tone expressed between managers' introductory statements and their Q&A responses. Understanding how word choices during corporate disclosures promote trust and credibility can help managers adapt their disclosure to be more informative or exploit investor credulity (Teoh, 2018).

In the context of financial markets, in which managers communicate information to investors about past performance and projections for future performance, managers likely exhibit different affective states depending on their interpretation of company events and situations. Such affective states are more likely to be triggered when managers respond to questions from analysts. Given the affective state demonstrated in the earnings call, the behavior pattern of managers can affect investors' assessment of the company's performance (Mayew & Venkatachalam, 2012).

Senior company members have different styles: some managers are direct and informative speakers, while others are vague (Dzieliiski, Wagner, & Zeckhauser, 2017). In addition to the individual differences in how they transmit information, communication differences depend on a manager's role in the company. The knowledge CFOs and CEOs have about the company differs (Mayew & Venkatachalam, 2012). Furthermore, a company's quarterly income statements need to be interpreted by market analysts. Therefore, word choices by managers affect information processing. The communication style of corporate representatives affects the Q&A moment of earnings calls for financial analysts.

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Three strands in the literature explain the difference in the formation of expectations of buy-side and sell-side analysts, with the dispersion of expectations arising when: a) agents have access to information about the current state of the economy; b) agents interpret the same information about the current state of the economy differently; or c) the heterogeneous nature of predictions, in which divergent expectations emerge from a diverse set of information and strategies (Yamamoto & Hirata, 2012).

The literature identified differences between the tones of managers and analysts in North American companies. By studying the transcripts of 16 quarterly earnings calls during the years 2004 – 2007, Brockman et al. (2015) identified that, on average, managers have more optimistic tones than financial analysts. These results give rise to the debate on two important aspects. First, they highlight the role of intermediaries in disseminating the informational content present in this type of public disclosure. Second, they intensify the debate about who (institutional investors or individual investors) has the most significant capacity to analyze and interpret the tones in the earnings calls.

In this context, Brockman et al. (2017) investigated market reactions to tones of managers and analysts during earnings calls using 409 transcripts from the Hong Kong Stock Exchange from 2005 to 2015. In addition to the frequency of disclosure of calls – in Hong Kong, it is biannual; in the United States, it is quarterly – the authors found a difference in the credibility conferred by participants. While investors in the United States place more credibility on the tone of analysts than managers, Hong Kong investors are convinced by the tone of company managers rather than analysts.

In the Brazilian market, Moreira, Ramos, Kozak-Rogo, and Rogo (2016) analyzed the earnings calls of companies listed on B3 from 2008 to 2015. As a research strategy, the authors developed a proxy for the call duration, following Matsumoto, Pronk, and Roelofsen (2011). The duration of the interaction among participants helps measure the influence of the amount of information disclosed on the results and testing the obfuscation and ontology hypotheses. Among the research findings, it is worth noting that, during the calls, companies with "bad news" disclose more information than companies with "good news." Furthermore, the study found evidence that companies with positive and transitory results disclose more information than companies with positive and permanent results.

Additionally, it is worth highlighting the study by Souza (2017), which evaluated the tone used during earnings calls and its relationship with the company's performance in terms of Earning Before Interest, Taxes, Depreciation and Amortization (EBITDA). By evaluating the companies listed on B3, from 2010 to 2014, based on the models developed by Huang, Teoh, and Zhang (2014) and Davis, Ge, and Matsumoto (2015), the author showed that companies with better performance have a more optimistic tone, with effects on the current quarter and the quarter after the earnings conference call.

For Souza (2017), the basic premise that would justify the importance of studying narratives is the perception that the commonly evidenced quantitative information does not allow the presentation of the companies' real situation, specifically in performance and other economic aspects. In addition, the author emphasizes that the study on earnings conference calls is essentially a study on the behavior of voluntary disclosure of information contained in financial statements.

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METHODOLOGY

Sample and data collection

The initial database comprised 1,408 transcripts of earnings conference calls from 2010 to 2017 (32 consecutive quarters). They come from 44 Brazilian publicly traded companies with traded common shares, part of the Ibovespa index portfolio from January to April 2018, using only common shares to calculate abnormal returns. Earnings calls without a pdf file were excluded (241 transcripts), along with those where it was impossible to calculate the return (2 transcripts). After these exclusions, the final sample totaled 1,165 transcripts of earnings conference calls from 44 listed companies.

The transcripts of the earnings conference calls were written in English. The other variables in the study came from Bloomblerg®. Statistical treatment was performed using panel data regression. In methodological terms, the models (Fixed, Random, or Pooled Effects) were identified in balanced data, based on ordinary least squares (OLS) regression, which indicates the approach and other statistical tests to use (F Test, Breusch-Pagan, Hausman).

Econometric model and variables

Preliminarily, we conducted an event study to analyze how the different tones used by participants (managers and analysts) in the earnings conference calls influence stock returns. The event study is justified because it measures the impact of a specific event on the company's value (MacKinlay, 1997), and it is ideal for examining accounting and financial disclosures (Campbell, Lo, & MacKinlay, 1997). To achieve the objectives of this study, we use Equation 1:

$$BHAR_{it} = \alpha_0 + \sum_{j=1}^{n} \beta_j TONE^{J}_{it} + \gamma_k CONTROLS^{K}_{it} + \varepsilon_{it} \quad (1)$$

where, $BHAR_{it}$ is the buy-and-hold abnormal return of company *i* in period *t*; α_0, β_j *e* γ_k are the regression model coefficients; $TONE^{J}_{it}$ is the tone expressed in the earnings calls of company *i* in period *t* for the participants *j*; $CONTROLS^{k}_{it}$ represents the control variables *k* of company *i* in period *t*; and ε_{it} represents the regression's error term.

Content analysis was adopted with a dictionary-based approach to calculate the tone in earnings conference calls ($TONE^{J}_{it}$) using the Provalis Research® software. It is noteworthy that the dictionary-based approach employs a glossary prepared by experts in the field. According to Kearney and Liu (2014), the dictionary developed by Loughran and McDonald (2011) is the most appropriate for financial textual analysis. This dictionary was used in its original version in English, so it was not necessary to translate the transcripts.

Since the variable $TONE^{J}_{it}$ is a segregated representation of the tone for each participant, considering that $j = 1$, the tone is calculated as $TONE_{it} = (POS_{it} - NEG_{it} / POS_{it} + NEG_{it})$, according to the methodology of Henry (2008), also adopted by Price, Doran, Peterson, and Bliss (2012), Henry and Leone (2016), and Brockman et al. (2017). When $j > 1$, we have the calculation of the tone for each type of participant. The analysis sequence (Figure 1) used includes the main participant groups and assess the tone of each part of the earnings calls.

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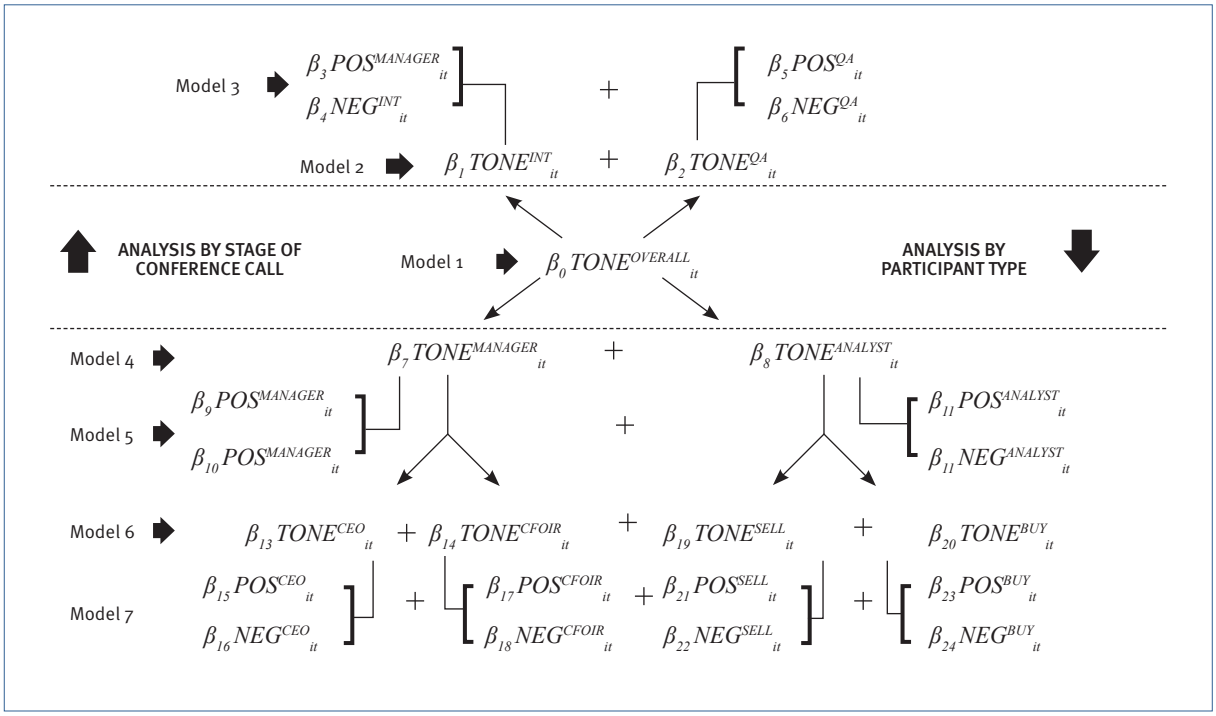
Figure 1. **Steps of tone analysis by participant type and part of earnings conference calls**



Thus, the general tone analysis model for the participants *j* follows two distinct approaches, the first is:

$$BHAR_{it} = \alpha_0 + \beta_{13} TONE^{CEO}_{it} + \beta_{14} TONE^{CFOIR}_{it} + \beta_{19} TONE^{SELL}_{it} + \beta_{20} TONE^{BUY}_{it} + y_k CONTROLS^{K}_{it} + \varepsilon_{it} \quad (2)$$

where the variable $TONE^{CEO}_{it}$ is the calculated tone for the CEOs, and the variable $TONE^{CFOIR}_{it}$ is the calculated tone for the CFO or IR. Regarding the variables, $TONE^{SELL}_{it}$ and $TONE^{BUY}_{it}$ are the tones of the sell-side and buy-side analysts, respectively.

In an alternative approach, the direct effect of positive or negative words is evaluated using the LM dictionary:

$$BHAR_{it} = \alpha_0 + \beta_{15} POS^{CEO}_{it} + \beta_{16} NEG^{CEO}_{it} + \beta_{17} POS^{CFOIR}_{it} + \beta_{18} NEG^{CFOIR}_{it} + \beta_{21} POS^{SELL}_{it} + \beta_{22} NEG^{SELL}_{it} + \beta_{23} POS^{BUY}_{it} + \beta_{24} NEG^{BUY}_{it} + \gamma_k CONTROLS^{k}_{it} + \varepsilon_{it} \quad (3)$$

where participants *j* POS^{j}_{it} and NEG^{j}_{it} represent the number of positive and negative words identified in each call. $POS^{MANAGER}_{it} = POS^{CEO}_{it} + POS^{CFOIR}_{it}$ is equivalent to the number of positive words of the corporate representatives, and $POS^{ANALYST}_{it} = POS^{SELL}_{it} + POS^{BUY}_{it}$ represents the number of positive words used by the

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analysts. The same interpretation is applied to the number of negative words. The wide segregation of participants *j* (managers: CEO, CFO/IR, and analysts: sell-side and buy-side) is a differential since previous studies only segregated between managers and analysts.

Similarly, the approach to identify each participant's tone is also applied to identify the general tone of each part of the earnings calls:

$$BHAR_{it} = \alpha_0 + \beta_1 TONE^{INT}{}_{it} + \beta_2 TONE^{QA}{}_{it} + \gamma_k CONTROLS^{k}{}_{it} + \varepsilon_{it} \quad (4)$$

where the variable $TONE^{INT}{}_{it}$ represents the tone during the introductory part, while $TONE^{QA}{}_{it}$ is the tone during the Q&A. It also analyzes the effects of positive and negative words in the context of the different parts of the calls.

The proxy for the accumulated abnormal return used in this study is the Buy-and-Hold Abnormal Return (BHAR), accumulated as proposed by Barber and Lyon (1997) and the abnormal return calculation by MacKinlay (1997):

$$BHAR_{i(\tau_1,\tau_2)} = \prod_{t=0}^{\tau_2}(1 + AR_{i,t}) \qquad comAR_{i,t} = R_{i.t} - (\widehat{\alpha}_i + \widehat{\beta}_i R_{mt}) \quad (5)$$

where, $BHAR_{it}$ represents the buy-and-hold abnormal return of company *i* in period *t*, accumulated in an event window that encompasses the event day (t_0) and the following day ($t+1$) and a 30-day estimated window; AR_{it} is the abnormal return for company *i* in period *t*, with $R_{it} = \ln(P_t / P_{t-1})$ being the daily stock return, with P_t and P_{t-1} representing the daily share price of the selected companies *i* in the sample and $R_{mt} = \ln(C_t / C_{t-1})$ as the daily market return with C_t and C_{t-1} representing the daily price of the market portfolio (Ibovespa) in periods *t* and *t-1*, respectively.

Table 1 presents the control variables:

Table 1. **Control variables used in the statistical models**

Variables	Description	Formula	Literature
BM_{it}	Variable that represents the Book-to-market indicator of company *i* in period *t*	$BM_{it} = \text{BOOK_VAL_PER_SH}$	Price et al. (2012), Bannier, Pauls and Walter (2017), and Brockman et al. (2017).
LEV_{it}	Variable that represents the leverage of company *i* in period *t*	$LEV_{it} = \frac{BS_TOT_LIAB2}{BS_TOT_ASSET}$	Price et al. (2012), Bannier et al. (2017), Brockman et al. (2015, 2017).
$SIZE_{it}$	Variable that represents the capitalization and market of company *i* in period *t*	$SIZE_{it} = \ln(TO_MKT_VAL)$	Price et al. (2012), Bannier et al. (2017), Henry e Leone (2016), and Brockman et al. (2017).
$SUPR_{it}$	Variable that represents the surprise in the results of company *i* in period *t*	$SUPR_{it} = \frac{(EPS_{it} - EPS_{i,t-1})}{P_{i,t-1}}$	Price et al. (2012), Bannier et al. (2017), and Brockman et al. (2017).
$LnAT_{it}$	Variable that represents the total assets of company *i* in period *t*	$\ln(BS_TOT_ASSET)$	

Note: The variables were calculated from data extracted from Bloomberg®, with *BS_TOT_ASSET* being the total assets; *BS_TOT_LIAB2* the total liability; *BOOK_VAL_PER_SH* the book value per share; *TOT_MKT_VAL* the total market value; *EPSit=IS_EPS* represents earnings per share, with $P_{i,t-1}$ being the share price in the previous quarter.

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RESULTS AND DISCUSSION

We divided the tones obtained from the sample according to the part of the call and the type of participants. During earnings conference calls, $TONE^{OVERALL}$ tends to be more positive than negative, with an average of 0.042. The standard deviation is 0.235, and the range is from a minimum of -0.714 to a maximum of 0.818, indicating considerable variation compared to the variable of interest (Table 2).

Table 2. **Descriptive statistics**

Panel A: descriptive statistics for variable BHAR (0.1) and variables TONE (2010-17)

Statistics	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient	Asymmetry	Kurtosis
BHAR (0,1)	-0.239	0.242	0.000	0.043	247.438	0.421	8.217
$TONE^{OVERAL}$	-0.714	0.818	0.042	0.235	5.623	-0.130	2.824
$TONE^{INT}$	-0.800	1.000	0.224	0.306	1.369	-0.363	2.867
$TONE^{QA}$	-1.000	0.700	-0.133	0.309	-2.322	-0.707	4.017
$TONE^{MANAGER}$	-0.733	0.846	0.168	0.265	1.579	0.124	2.978
$TONE^{ANALYST}$	-1.000	1.000	-0.099	0.281	-2.852	-0.301	4.354
$TONE^{CEO}$	-0.714	0.911	0.181	0.274	1.514	0.471	2.749
$TONE^{CFOIR}$	-0.867	0.938	0.117	0.294	2.509	-0.112	2.947
$TONE^{SELL}$	-0.833	0.750	-0.084	0.261	-3.116	0.082	3.097
$TONE^{BUY}$	-0.857	0.846	-0.031	0.210	-6.839	-0.678	6.706

Panel B: Descriptive statistics of words classified as positive and negative by the LM dictionary

Statistics	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient	Asymmetry	Kurtosis
POS^{INT}	2	189	33.209	24.608	0.741	1.734	7.919
NEG^{INT}	0	126	19.068	13.181	0.691	2.041	11.589
POS^{QA}	0	286	36.227	28.268	0.780	1.452	8.734
NEG^{QA}	0	164	41.548	28.844	0.694	0.920	3.854
$POS^{MANAGER}$	1	339	58.409	38.390	0.657	1.479	7.048
$NEG^{MANAGER}$	2	203	38.657	22.932	0.593	1.472	7.554
$POS^{ANALYST}$	0	49	11.894	8.790	0.739	0.782	3.377
$NEG^{ANALYST}$	0	73	15.397	12.391	0.805	1.154	4.477

Panel C: Descriptive statistics of words classified as positive and negative, segregated by participant type

Statistics	Minimum	Maximum	Average	Standard Deviation	Variation Coefficient	Asymmetry	Kurtosis
POS^{CEO}	0	180	25.112	31.311	1.247	1.594	5.554
NEG^{CEO}	0	117	13.464	17.334	1.287	1.816	7.245
POS^{CFOIR}	0	121	24.026	20.921	0.871	1.504	5.778
NEG^{CFOIR}	0	126	18.097	15.732	0.869	1.539	6.959
POS^{SELL}	0	46	9.930	7.804	0.786	0.859	3.588
NEG^{SELL}	0	61	12.711	10.855	0.854	1.155	4.421
POS^{BUY}	0	15	1.249	2.310	1.849	2.356	9.227
NEG^{BUY}	0	39	1.670	3.205	1.920	3.593	26.643

Note: The number of observations is 1,165. BHAR (0.1) is the Buy-and-Hold Abnormal Return, calculated in an event window comprising periods $_{t0}$ and $t + 1$; TONE is the calculated tone; POS and NEG are the positive and negative word count, respectively, for each participant and each part of the conference call.

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After separating the $TONE^{MANAGER}$ and the $TONE^{ANALYST}$, the managers' tone tends to be positive (averaging 0.168), and the analyst's tone is more likely to be negative (with an average of -0.099). This corroborates Brockman et al. (2015) for the United States and Brockman et al. (2017) for Hong Kong. These studies showed that the managers' tones are significantly more positive than the analysts' tones, demonstrating that analysts and investors decide based on what managers choose to discuss and disclose in earnings conference calls (Black et al., 2013).

Regarding the differences between the two parts of the earnings call (introductory and Q&A), the $TONE^{INT}$ of management is the most positive of all tone measures. Its average value is 0.224, and $TONE^{Q\&A}$ is negative, with an average of -0.133. It is possible to notice that the linguistic tone during the Q&A changes immediately after the introductory statements. The distribution of tone in the introductory part resembles a normal distribution with a moderate degree of asymmetry (x^2 of 105.42 and p-value of 0.000 for Jarque-Bera normality test), while in the Q&A, it is leptokurtic, with negative asymmetry due to a heavy tail on the negative side (χ^2 of 25.14 and p-value of 0.000 for Jarque-Bera normality test), due the sample showed transcribed calls that only registered negative words.

For the main groups of participants, the frequency distribution of the tone of company managers ($TONE^{MANAGER}$) is slightly shifted to the right (average of 0.168, χ^2 of 17.10 and p-value of 0.002 for Jarque-Bera normality test). In contrast, the tone of the analysts ($TONE^{ANALYST}$) has negative asymmetry (average of -0.099, χ^2 of 39.10 and p-value of 0.000 for Jarque-Bera normality test), with a concentration of values close to the average (leptokurtosis). Similar results were found by Brockman et al. (2015).

With the application of the LM dictionary, it was observed an average greater volume of both positive and negative words in the Q&A part compared to the introductory part of the earnings calls. This result is explained by greater interaction between participants in the Q&A. However, how the debate and the Q&A are driven depends on the information presented in the introductory part.

The number of positive and negative words is also useful to identify the acting pattern of each type of participant. On average, CEOs and CFOs/IRs use more positive words than negative in their speeches. CFOs/IRs tend to use more negative words than CEOs, as can be seen in Table 2. The comparison between the number of words used by sell-side and buy-side analysts revealed that sell-side analysts (POS^{SELL}, average of 9,930 with a maximum of positive words of 46 and NEG^{SELL}, average of 12,711 with the maximum number of negative words of 61) use a greater number of both positive and negative words compared to buy-side analysts (POS^{BUY}, average of 1,249 with maximum positive words of 15 and NEG^{BUY}, average of 1,670 with maximum of negative words of 39). This finding can be attributed to the heterogeneous nature of predictions, in which divergent expectations are formed from a diverse set of information and strategies (Yamamoto & Hirata, 2012).

Table 3 shows the matrix of correlations between the study variables.

Table 3. Correlation matrix

Panel A: Pearson correlation between BHAR (0.1) and the TONE variables (2010-17)

VARIABLES	BHAR (0,1)	$TONE^{OVERALL}$	$TONE^{INT}$	$TONE^{QA}$	$TONE^{MANAGER}$	$TONE^{ANALYST}$
BHAR (0,1)	1					
$TONE^{OVERALL}$	0.1147**	1				
$TONE^{INT}$	0.1087**	0.7622**	1			
$TONE^{QA}$	0.0723**	0.5867**	0.3055**	1		
$TONE^{MANAGER}$	0.0926**	0.9475**	0.8270**	0.5453**	1	
$TONE^{ANALYST}$	0.1137**	0.4759**	0.1751**	0.4779**	0.3265**	1

Panel B: Pearson correlation between BHAR (0.1) and control variables (2010-17)

VARIABLES	BHAR (0.1)	SIZE	BM	LnAT	SUPR	LEV
BHAR (0.1)	1					
SIZE	-0.0604**	1				
BM	0.0364	-0.0244	1			
LnAT	-0.0814**	0.8578**	-0.3240**	1		
SUPR	-0.0236	-0.0034	-0.0021	0.0061	1	
LEV	0.0197	0.2501**	0.1610**	0.3376**	0.0086	1

Note: ** corresponds to statistically significant variables at the 5% level.

Panel A of Table 3 shows that the correlation between the managers' tone ($TONE^{MANAGER}$) and the overall tone of the earnings calls is greater than the correlation between the general tone and the analysts' tone ($TONE^{ANALYST}$). Similar results were observed in the studies by Brockman et al. (2015, 2017).

The lowest correlation between the analysts' tone ($TONE^{ANALYST}$) and the introductory tone ($TONE^{INT}$) was expected because the analysts only speak during the Q&A part of the calls. In turn, the correlation between the introductory part ($TONE^{INT}$) and the Q&A part ($TONE^{QA}$) was 0.3055. In the analysis among participants, the correlation between the managers' tone ($TONE^{MANAGER}$) and the analysts' tone ($TONE^{ANALYST}$) was 0.3265. These lower levels of correlation demonstrate changes in positioning between the parts of the calls and among participants. Panel B contains the correlations for the control variables. There is a low correlation between the dependent variable and the explanatory variables, around 0.10 in relation to the tone, and at levels below 0.05, in most cases, with the control variables.

Then, the effect of the tone on abnormal return was analyzed, in general terms, by the part of the earnings call and by type of participant. Also, the analysis of the direct effect of positive and negative words was conducted. Table 4 shows the results.

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Table 4. **Results of panel data regressions with pooled model, with estimation of the tone segregated by conference call part and by type of participant**

Panel A: Estimation of models

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
$TONE^{OVERALL}$	0.0188***	-	-	-	-
$TONE^{INT}$	-	0.0120***	-	-	-
$POS^{INT\ (1)}$	-	-	0.0148*	-	-
$NEG^{INT\ (1)}$	-	-	-0.0203	-	-
$TONE^{QA}$	-	0.0058	-	-	-
$POS^{QA\ (1)}$	-	-	0.0124	-	-
$NEG^{QA\ (1)}$	-	-	-0.0048	-	-
$TONE^{MANAGER}$	-	-	-	0.0089*	-
$POS^{MANAGER\ (1)}$	-	-	-	-	0.0054
$NEG^{MANAGER\ (1)}$	-	-	-	-	-0.0065
$TONE^{ANALYST}$	-	-	-	0.0132***	-
$POS^{ANALYST\ (1)}$	-	-	-	-	0.0847***
$NEG^{ANALYST\ (1)}$	-	-	-	-	-0.0363*
$SIZE^{(1)}$	0.4870	0.5140	0.4480	0.5090	0.4570
$BM^{(1)}$	-0.0357	-0.0452	-0.0445	-0.0388	-0.0503
$LnAT^{(1)}$	-0.409*	-0.4520*	-0.4770**	-0.4140*	-0.4610*
$SUPR^{(1)}$	-0.4740	-0.4560	-0.4810	-0.4960	-0.4870
$LEV^{(1)}$	0.0171*	0.0168*	0.0171*	0.0164*	0.0139
constant	0.0099	0.0123	0.0159*	0.0104	0.0161

Panel B: Model specification tests and econometric tests

F Test					
t-stat	1.59	1.56	1.58	1.71	1.72
p-value	0.0097	0.0131	0.0111	0.0034	0.0030
LM Test					
t-stat	2.12	1.44	1.53	3.24	3.34
p-value	0.0728	0.1155	0.1077	0.0359	0.0338
Hausman Test					
t-stat	5.15	-	-	7.56	12.15
p-value	0.5253	-	-	0.373	0.2049
Specification	POLS	POLS	POLS	POLS	POLS

Note: POLS represents the Pooled OLS specification. For comparison purposes, we chose to present the results of the Pooled model. Given the proximity of these results with the fixed effects and random effects specifications, and to keep this article concise, these specifications were not presented but can be requested from the authors. *, ** and *** correspond to the significance levels of 10%, 5% and 1% respectively. (1) Given the magnitude of the coefficients and to facilitate data visualization, the estimated values should be divided by 100.

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From the analysis of Model 1, we observe that the general tone ($TONE^{OVERALL}$) exerts a statistically significant influence at the level of 1% on the abnormal return calculated by the BHAR methodology (1.0). This finding is similar to Price et al. (2012), Henry and Leone (2016), and others. Among the control variables, there is evidence that investors react to numerical representations of company size (LnAT) and financial leverage (LEV). The signals observed in these variables are consistent with the findings of Brockman et al. (2017).

Analyzing Model 2, when segregating the results from the introductory ($TONE^{INT}$) and the Q&A ($TONE^{QA}$) parts of the calls, the tone was statistically significant at 1% with the abnormal return calculated by the BHAR methodology (1.0). The positive effect between the introductory tone and the abnormal return is similar to that found by Brockman et al. (2017) for the Hong Kong market, which adopted the CAR (0.1) specification for abnormal returns, and in the study by Price et al. (2012), for the North American market, in which the specification for the accumulated abnormal return was CAR (-1.1). In this context, a possible interpretation is that participants tend to give more relevance to the content provided in the introductory part of the calls. The dialogue in the Q&A tending to be structured based on the information presented in the introductory part.

Model 3 captured the direct effects of positive (or negative) words on the abnormal return in the introductory and Q&A parts. It was observed that only the positive words in the introductory section (POS^{INT}) exert some influence on the abnormal return. Verrecchia (2001) explained that when evaluating voluntary disclosure in their categorization of association-based disclosure, managers tend to ensure the transmission of information that impacts positively and retain information that negatively impacts the company value. In this context, as shown in Table 2, the average number of positive words in the introductory part (33.209) exceeds the average of negative words (19.068) by 74.16%. Thus, negative information is usually obtained during the Q&A, in which the average number of negative words (41,548) exceeds positive words (36,227).

Model 4, evaluating the main groups of participants in the earnings calls, found that only the analysts' tone ($TONE^{ANALYST}$) was statistically significant at 1% on the abnormal return. Similar results were obtained by Brockman et al. (2015), with the specification of CAR (0.1) for abnormal return, and by Borochin et al. (2018), who related the analysts' tone to stock price volatility. In this context, given the more frequent occurrence of positive tones by managers, the market tends to capture additional information transmitted throughout the calls. Among this information, analysts (sell-side or buy-side), which, according to Blau et al. (2015), are considered "sophisticated investors," can induce the investors' behavior.

In this analysis line, Model 5 demonstrates that analysts' positive and negative words affect the abnormal return corroborating the results presented in Model 4. A 1% variation in the number of positive words has a 0.095% effect on the abnormal return, while the same variation in the number of negative words has a 0.045% negative effect. As analysts use, on average, more negative words. When they use positive words, there is a market reaction resulting in abnormal positive returns.

The results presented in Table 5 were used to develop the analysis by type of participant. Also, pooled OLS was applied since both null hypotheses of the Breusch-Pagan F and LM tests at the significance level of 5% were confirmed.

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Table 5. **Panel data results of tone by participants with Pooled OLS model, with tone estimation segregated by type of participant**

Panel A: Estimation of models

Variables	Model 6			Model 7		
	POLS	FE	RE	POLS	FE	RE
$TONE^{CEO}$	0.0070	0.0065	0.0071	-	-	-
$POS^{CEO\ (1)}$	-	-	-	-0.0006	-0.0008	-0.0011
$NEG^{CEO\ (1)}$	-	-	-	-0.0041	-0.0022	-0.0044
$TONE^{CFOIR}$	0.0089*	0.0025	0.0073	-	-	-
$POS^{CFOIR\ (1)}$	-	-	-	0.0195**	0.0108	0.0179*
$NEG^{CFOIR\ (1)}$	-	-	-	-0.0199	-0.0824	-0.0168
$TONE^{SELL}$	0.0112**	0.0106*	0.0111**	-	-	-
$POS^{SELL\ (1)}$	-	-	-	0.0761***	0.0885***	0.0820***
$NEG^{SELL\ (1)}$	-	-	-	-0.0382*	-0.0560**	-0.0426**
$TONE^{BUY}$	0.0053	0.0108	0.0068	-	-	-
$POS^{BUY\ (1)}$	-	-	-	0.1720**	0.1900**	0.1800**
$NEG^{BUY\ (1)}$	-	-	-	-0.0384	-0.1250**	-0.621
$SIZE^{(1)}$	0.5020	0.1400	0.4600	0.3910	0.1400	0.3670
$BM^{(1)}$	-0.0393	-0.0176**	-0.0551	-0.0486	-0.1710**	-0.0617
$LnAT^{(1)}$	-0.3910*	-0.6130	-0.4060*	-0.4200*	-0.6320	-0.4300*
$SUPR^{(1)}$	-0.5150	-0.4830	-0.5000	-0.5480	-0.5300	-0.5410
$LEV^{(1)}$	0.0167*	0.3150	0.0185*	0.0143	0.0365	0.0166*
constant	0.0073	0.0422	0.0103	0.0134	0.0404	0.0149

Panel B: Model specification tests and econometric tests

F Test		
t-stat	1.61	1.66
p-value	0.0082	0.0054
LM Test		
t-stat	1.82	2.22
p-value	0.0884	0.0680
Hausman Test		
t-stat	16.33	21.27
p-value	0.0603	0.0677

Note: POLS represents the Pooled OLS specification, FE fixed effects, and RE random effects. *, ** and *** correspond to the significance levels of 10%, 5% and 1%, respectively. (1) Given the magnitude of the coefficients and to facilitate data visualization, the estimated values should be divided by 100.

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In Model 6, the group of company managers was divided into CEO and CFO or IR, and the group of analysts was divided into sell-side and buy-side. Among the results, it is worth noting that the CFO/IR tone has a positive and statistically significant effect on the abnormal return, and the CEO tone was also significant but less so. Despite the differences identified in the literature of emotional state (Mayew & Venkatachalam, 2012), or the presence of deceptive practices (Larcker & Zakolyukina, 2012) in the CEO or CFO behavior, the fact that the CEO uses practically twice the amount of positive words (25,112 on average, as noted in Table 2) than negative words (13,464) means that the CEOs' behavior is more predictable, with no noticeable effects on abnormal returns.

In turn, the sell-side analyst tone has a positive and statistically significant effect on the abnormal return. It is worth noting that, in earnings conference calls, there is more frequent participation of sell-side analysts and, as this type of analyst has a direct relationship with the company managers, this helps to improve their dialogue during the calls, thus influencing other investors. Furthermore, when analyzing the effect of the positive and negative words classified by the LM dictionary of each participant (Model 7), the positive words of the CFO/IR, the sell-side analyst, and the buy-side analyst have a positive effect on the abnormal return. There was also a positive and statistically significant effect on the abnormal return (Model 6) for the buy-side analyst tone but smaller than that of the sell-side analyst. However, when comparing the use of words (Model 7), we see a greater effect on the use of positive words by buy-side analysts than the effect related to sell-side analysts.

In short, the amount of positive words by CEOs, who normally have a positive tone, does not influence the abnormal return. In contrast, the number of positive words by CFO/IRs, considered to have a more neutral tone (on average, approximately 57 % of words are positive and 43% negative), has a small effect (0.019) on abnormal returns. On the other hand, the sell-side analyst, who has more information and uses more positive words, generates a higher positive abnormal return (0.076). However, the abnormal return is greater when the buy-side analyst, who is expected to have less information, uses positive words (0.172). These findings align with Groysberg, Healy, Serafeim, and Shanthikumar (2013), who concluded that buy-side analysts' recommendations are less optimistic than sell-side analysts due to fewer conflicts of interest. Hobbs and Singh (2015) suggest that sell-side analysts outperform buy-side analysts in negotiations and recommendations, despite the conflicts of interest documented in the literature.

CONCLUSION

This study focused on voluntary disclosures through quarterly earnings conference calls, which do not follow the mandatory standards regulated by law and are dynamic and interactive means of communication between managers and stakeholders.

This study analyzed the different tones used by the participants of earnings conference calls and their influence on generating abnormal stock returns. The main contribution of this study is filling the gap in the literature of segregation of tone analysis by type (buy-side analyst and sell-side analyst) and by corporate representatives (CEO, CFO, or IR) during the earnings conference calls.

It is noteworthy that the research findings reinforce other studies and research on the subject mostly focused on the North American market. Thus, this work improves the understanding of the influence of tone in the stock market, arguing that an event of disclosure should be considered beyond the numbers presented in financial statements.

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This article analyzed the relationship of tone in transcribed earnings conference calls on stock market reaction using Brazilian companies listed on B3, with five main findings. First, the tone of earnings conference calls has significant predictive power over stock market reactions. Second, predictability is predominant during the introductory part of the calls, specifically in the managers' opening speech.

The third finding is that participants tend to give more relevance to the analysts' tone than to the managers' tone in earnings conference calls in Brazil. This result is similar to recent discoveries in the North American scenario and contrary to findings obtained in Hong Kong. The fourth finding concerns the segregation by corporate representatives (CEO and CFO/IR) during earnings conference calls and that both corporate representatives drive a market reaction. Finally, the fifth finding refers to the segregation of the tone analysis by the type of analyst (buy-side and sell-side), indicating a greater reaction to tone presented by sell-side analysts.

It is noteworthy that, in the analysis of the dynamic interaction between managers and the external investment community, it was possible to identify four main results. The first empirical finding shows that the tone in the introductory part of the transcribed calls is more positive than during the Q&A. The second finding concerns the positive effects of the analysts' tone on market returns. Aggregated analysis on the group of analysts who spoke during the Q&A revealed that the words classified as positive or negative were monitored and evaluated by other investors in the market. Separately, of the group of managers, the CFO/IR showed greater influence than the CEO.

Finally, this study contributed to understanding the tones presented by managers and analysts in earnings conference calls. First, it measured the overall tone. Then compared the two parts of the call – the introductory part and the Q&A – showing the different tones presented according to each participant segregated into managers (CEO and CFOIR) and analysts (sell-side and buy-side). The findings suggest that investors should pay close attention to all participants as they can generate a reaction in the stock market.

In addition, there is evidence on the sources and channels of information transfer during earnings conference calls. The findings confirm the proposal of this research that participants' tone affects the intensity and direction of the stock market over time.

In short, this study contributed to the literature by focusing on the tone expressed by managers and analysts. The contribution of this research is the tone difference between managers (CEO, and CFO or IR) and analysts (sell-side and buy-side), and the separation between positive and negative words, to understand better the behavior of stock returns after earnings conference calls. It is also worth noting that the two main parts of earnings conference calls were differentiated, separating the speech in the introductory part from the more spontaneous Q&A part. Overall, the findings on earnings conference calls and stock returns point to several areas of interest for further research.

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AUTHOR'S CONTRIBUTIONS

Joyce Menezes da Fonseca Tonin and Luciano Marcio Scherer worked on the conceptualization and theoretical-methodological approach as well as on data analysis, writing and final revision of the manuscript. The theoretical review and data collection was conducted by Joyce Menezes da Fonseca Tonin.

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GREENHOUSE GAS EMISSION ALLOWANCES: FINANCIAL REPORTING TRANSPARENCY

Licenças de emissão de gases com efeito de estufa: Transparência da informação financeira

Derechos de emisión de gases de efecto invernadero: Transparencia de la información financiera

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ABSTRACT

This research analyzes the influence that the performance of GHG emissions has on the level of transparency in financial reporting. Content analysis of the financial statement notes allowed the level of transparency to be measured. The results suggest that the level of transparency in financial reporting is negatively related to the performance of GHG emissions when financial reports are prepared on the basis of the International Financial Reporting Standards. It was also concluded that more 'good news' is disclosed by companies when their GHG emissions' performance reduces. This study complements previous literature about transparency in financial reporting, and the necessity to relate it to eco-efficiency measures to empower the decision-making process of stakeholders. The study also provides a reference for European accounting regulators on the behavior of companies with regard to this issue.

KEYWORDS | Greenhouse gas emissions, International Financial Reporting Standards, financial reporting, panel data.

RESUMO

Este estudo analisa a influência do comportamento das emissões de gases de efeito estufa no nível de transparência da informação financeira. Uma análise de conteúdo dos anexos às contas anuais das empresas permitiu medir seu nível de transparência. Os resultados sugerem que o nível de transparência da informação financeira está negativamente relacionado com o desempenho das emissões de gases de efeito estufa quando elaborado com base nas normas internacionais de relatório financeiro. Além disso, concluiu-se que essas empresas revelam mais "boas notícias" quando há baixo desempenho nas emissões de gases. Este estudo complementa a literatura anterior sobre a transparência da informação financeira e a necessidade de relacioná-la com medidas de ecoeficiência para melhorar a tomada de decisões dos usuários da informação. O estudo constitui igualmente uma referência para os órgãos reguladores contábeis europeus sobre o comportamento das empresas nesse domínio.

PALAVRAS-CHAVE */ Emissões de gases de efeito estufa, norma internacional de relatório financeiro, relatório financeiro, dados em painel.*

RESUMEN

Esta investigación analiza la influencia que tiene el comportamiento de las emisiones de gases de efecto invernadero (GEI) en el nivel de transparencia de la información financiera. El análisis del contenido de las notas de los estados financieros de las compañías permitió medir el nivel de transparencia. Los resultados sugieren que el nivel de transparencia de la información financiera está negativamente relacionado con el desempeño de las emisiones de GEI cuando los informes financieros se preparan sobre la base de las Normas Internacionales de Información Financiera. Además, se llegó a la conclusión de que esas empresas revelan más "buenas noticias" cuando se reduce el rendimiento de las emisiones de gases. Este estudio complementa la literatura anterior sobre la transparencia de la información financiera y la necesidad de relacionarla con las medidas de ecoeficiencia para potenciar el proceso de toma de decisiones de los grupos de interés. Asimismo, el estudio proporciona una referencia para los reguladores contables europeos sobre el comportamiento de las empresas en esta materia.

PALABRAS CLAVE */ Emisiones de gases de efecto invernadero, norma internacional de información financiera, información financiera, datos en panel.*

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INTRODUCTION

Accounting environmental matters incorporates a two-fold type of information for stakeholders (Burritt, Schaltegger, & Zvezdov, 2011): on the one hand, the financial impacts induced by environmental issues, and on the other, the physical impacts on the environment that sometimes result in a relationship of conflict and/or dependency.

Interest in the financial impacts of environmental matters has increased in the European Union (EU) following two milestones (Llena, Moneva, & Hernandez, 2007): Recommendation 2001/453 of May 30 on the recognition, measurement and disclosure of environmental information in annual accounts and annual reports; and implementation of the European Union Emission Trading Scheme (EU ETS). Both of these indicate that environmental behavior should be published in company accounts and/or management reports, insofar as they may have an influence on the financial situation.

In the context of a cap-and-trade emissions trading scheme, the literature agrees that transactions should be included in financial reports (Giner-Inchausti, 2014; Lovell, Bebbington, Larrinaga, & Aguiar, 2013 PricewaterhouseCoopers & International Emissions Trading Association, 2007; Ragan & Stagliano, 2007). The accounting treatment of emission allowances (EAs) and GHG emissions increased in importance with the development of regulated markets, such as the EU ETS, as they can have a significant economic and financial influence on financial statements, whether with regard to the nature of transactions, or in terms of value (Mateos & Bilbao, 2007; Warwick & Ng, 2012).

Despite the much-discussed materiality of EU ETS transactions, by incorporating an accounting treatment for their nature, companies are enabling fair and transparent comparisons to be made between financial statements (Giner-Inchausti, 2014), as non-disclosure may result in a distortion of the information that is disclosed (Ragan & Staliano, 2007). This study argues that an eloquent aspect to consider in adopting accounting policies to include those transactions that reflect the companies' participation in the EU ETS should be transparency when disclosing these polices (Haupt & Ismer, 2011), in the same way that financial reporting has achieved with other environmental matters (Larrinaga, Carrasco, Correa, Llena, & Moneva, 2002; Ortas, Gallego-Álvarez, & Álvarez-Etxeberria, 2015).

Some regulators acknowledge that financial reports should incorporate information about transactions involving EAs and GHG emissions, which, from our point of view, would contribute towards increasing the levels of transparency of these reports.

Frequently discussed in the literature, but mainly with regard to voluntary reports, is the influence that environmental performance has on environmental disclosure (Cho & Patten, 2007; Clarkson, Li, Richardson, & Vasvari, 2008; Liu, Zhou, Yang, & Hoepner, 2017; Milanés-Montero & Pérez-Calderón, 2011; Patten, 2002). With the growing concern to include environmental matters in financial reporting, Larrinaga et al. (2002) and Llena et al. (2007) suggested that this is not just a response to mandatory regulation, but also to the motivation to project a less negative image to stakeholders. In relation with the EU ETS, this less negative image may be provided by measuring the performance of GHG emissions, which is suggested in this study as being an influence on the levels of transparency in the financial reporting of environmental matters. This research analyzes the influence that the GHG emissions' performance has on the level of transparency in financial reports when they are prepared on an International Financial Reporting Standards basis. The analysis is developed taking into consideration the level of information about good and bad news that is disclosed by companies depending on their GHG emissions' performance. Transparency in financial reporting is related to eco-efficiency measures given the importance of

this information in the decision-making processes of stakeholders. The study distinguishes itself from previous studies because: (1) it addresses the importance of the level of transparency for EAs and GHG emissions in financial reporting; (2) it relates a measure of environmental financial reporting to a measure of environmental performance, which is a new approach to the relationship of items that are frequently associated in the literature.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

The financial reporting of EAs, GHG emissions and transparency issues

In 2005 the IASB released IFRIC 3 'Emission Rights' for application after the beginning of Phase I of the EU ETS, but just six months later it decided to withdraw the interpretation, arguing that there had been a misinterpretation of the urgency of the standard. The justification for doing so, which was in line with negative advice coming from the European Financial Reporting Advisory Group (EFRAG), was that the prescribed accounting treatment created mismatches in financial statements. EFRAG and extensive previous literature (Bebbington & Larrinaga-González, 2008; Black, 2013; Ertimur, Francis, Gonzales & Schipper, 2017; Giner-Inchausti, 2014; Lovell et al., 2013; MacKenzie, 2009; Steenkamp, Rahman, & Kashyap, 2011; Veith, Zimmermann, & Werner, 2009; Warwick & Ng, 2012) had pointed out that the mismatches introduced by IFRIC 3 were mainly due to a discordant measurement of the assets (the EAs) and the liabilities (GHG emissions), because the EAs were measured at cost, or a revaluation amount, while the liability was at fair value, which would result in an artificial volatility in the reported earnings and would not reflect the economic reality of the companies.

The withdrawal of IFRIC 3 was the start of an absence of international accounting regulations, with consequences as to the use of multiple accounting practices, as pointed out in various descriptive empirical studies (Ayaz, 2017; Black, 2013; Lovell, Aguiar, Bebbington, & Larrinaga-Gonzales, 2010; PWC & IETA, 2007; Warwick & Ng, 2012). Notwithstanding the IASB's position, national regulatory authorities felt impelled to overcome the lack of guidance (Cuesta, Moneva, & Larrinaga, 2006).

Previous literature has also concluded that there was highly frequent non-disclosure (Black, 2013; Lovell et al., 2010; PWC & IETA, 2007; Warwick & Ng, 2012). This may have been due to professional judgement interpreting transactions in a market that is based on the cap-and-trade system as being materially relevant (Busch & Hoffman, 2001). This is due to the grandfathering system that is considered in Phases I, II and even Phase III of the EU ETS for allocating EAs. This system also frequently justifies the adoption of off-balance sheet policies (Criado-Jiménez, Fernández-Chulián, Husillos-Carqués, & Larrinaga-González, 2008), although Lovell et al. (2013), providing evidence of the significant materiality of EAs, undermine the grounds of this justification.

Although there is a certain skepticism with regard to the usefulness of imposing recognition of these transactions (Giner-Inchausti, 2007), the multitude of approaches, including the use of off-balance sheet policies and non-disclosure, underlines the importance of having a common accounting treatment for obtaining transparency when comparing the financial reporting of EAs and GHG emissions (Giner-Inchausti, 2014; Lovell et al., 2010). In this respect we stress that the qualitative characteristic of relevance is not limited to materiality. It includes nature relevance, which is useful when revealing key disclosures, mainly in relation to environmental matters. Moreover, although transparency is not a principle established in the Conceptual Frameworks, Barth and Schipper (2008) include this perspective in their concept of financial reporting transparency.

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With regard to company behavior in the financial disclosure of environmental matters, Llena et al. (2007) concluded that companies disclose less 'bad news', like provisions and contingencies, than 'good news', such as investments and expenses. In a context of a multitude of approaches, therefore, achieving a higher level of transparency for EAs that are received for free, or for the liability with regard to GHG emissions, may not require mandatory reporting, as it may be connected with a company's motivation to disclose its attitude to the EU ETS (Adams, Coutts, & Harte, 1995). We therefore question whether the level of transparency in financial reporting that is imposed by national accounting standards, with a specific mandatory treatment, is significantly different from the level that is based on the IFRS, although the latter is recognized as a higher-quality set of financial standards.

Based on the Wiseman index, which focuses on the financial consequences of environmental activities, Clarkson et al. (2008) concluded that when exposure to GHG emission controls increases, mandatory disclosures in annual reports and 10K forms also increase. In fact, under voluntary disclosure schemes, the relationship between a company's environmental disclosure and its environmental performance has been frequently tested, but to our knowledge there are fewer studies into financial reporting. The next section develops the arguments on the influence of the GHG emissions' performance on the level of transparency in financial reporting, which will serve as the basis for formulating our hypothesis.

The influence of the performance of GHG emissions on the level of transparency in financial reporting

The EU ETS is a market-based mechanism aimed at controlling GHG emissions and making the costs of these emissions visible, and this has been a controversial issue, particularly in financial reporting, as discussed in the previous section. Financial reporting is a way of revealing to stakeholders the regulatory and market risks that influence accounting-based measures of performance (Schiemann & Sakhel, 2019).

In current literature, the level of transparency in financial reporting is frequently related to external factors that are imposed on companies, such as reporting regulations (Gallego-Álvarez, Martínez-Ferrero, & Cuadrado-Ballesteros, 2016; Giner-Inchausti, 1997; Veith et al., 2009), or to company characteristics, such as their environmental performance under the EU ETS. Jaggi, Allini, Macchioni and Zagaria (2018) state that it is important for investors to evaluate company risks that are associated with their carbon performance, which underlines the importance of greater transparency in carbon disclosures, even in code law countries. Conceptual frameworks for financial reporting, which define the fundamental concepts of the IFRS, state that financial disclosure has to be useful for stakeholders. This is the basis for arguing that there should be some correspondence between useful information and the performance measures of GHG emissions, with the advantage of obtaining (observable) fair value, which the market mechanism attributes to both EAs and GHG emissions (Ascui & Lovell, 2012). Lovell et al. (2013) also provided evidence that the materiality of EAs ranges from 14% to 85% of the profit/loss before tax, although they recognized that there is no obvious calculation for carbon accounting.

The disclosed accounting policies identified in the literature (Black, 2013; Lovell et al., 2010; Warwick & Ng, 2012) can be aggregated into two perspectives (Larrinaga et al., 2002): on one hand, companies may neglect aspects of the regulation that are not in their interests to report, and adopt a strategy of concealment (Criado-Jiménez et al., 2008) by using non-disclosure or off-balance sheet policies; and on the other, companies with better performance measures have a motivation to disclose more information, basing on approaches that provide related information, thereby improving their transparency.

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Previous literature has concluded that, in general, there is no significant association between environmental disclosure and environmental performance (Al-Tuwaijri, Christensen, & Hughes, 2004), although authors such as Qian & Schaltegger (2017) have found that a change in the level of carbon disclosure motivates an improvement in carbon performance. Although it was not a causal study, and we cannot relate it 'the other way around', we question if there is new evidence of improved levels of transparency motivated by behaviors with regard to GHG emissions. Based on the review of previous studies, we expect a lack of visibility in the performance of GHG emissions with respect to its level of transparency. Thus, we formulate the following non-directional hypothesis:

> H1: The level of transparency of the financial reporting of EAs and GHG emissions is not influenced by the performance of GHG emissions.

The following section presents our empirical research design and the methodology used for testing the hypothesis we formulated.

METHODOLOGY

Sample and data

As primary sources, we used national allocation plans (NAPs), annual financial statements and the European Commission's website in connection with the documentation of the Union Registry. Portugal, Spain and France were chosen because our focus is on distinguishing the effect of GHG emissions' performance on the level of transparency of financial reporting that is based on national accounting standards, which have an explicit accounting treatment for EAs and GHG emissions, from the full IFRS guidelines, which have no specific guidance in this respect. In all three countries listed companies must use IFRS when preparing and reporting their consolidated accounts.

The study period runs from 2008 to 2014, i.e., all five years of Phase II and the first two years of Phase III. It was not possible to compile the annual financial statements for the seven years for 88 companies, but initially we obtained 559 observations, an unbalanced panel.

In this study content analysis of the year-end financial statements was used to evaluate the accounting policies adopted in relation to the treatment of EAs and GHG emissions (Ayaz, 2017; Black, 2013; Steenkamp et al., 2011; Warwick & Ng, 2012) as annual accounts are the primary source of information employed by accounting practices.

Content analysis has become one of the commonest forms of data analysis used for providing descriptive knowledge and understanding a particular phenomenon being studied. It is often criticized, however, for its lack of rigor, the limited utility of its findings (Doris, Leung, Betty, & Chung, 2019), and for being an overly simple method. This may be the reason why this analysis process has been little discussed in literature. Unexpected difficulties may arise during the analysis process, however because: authors often see the beginning of the categorization phase as chaotic, since at that point they possess several, seemingly unconnected pieces of information; narrative material is generally not linear; and paragraphs from transcribed interviews may contain elements relating to several categories. To resolve this situation, it is necessary to be prepared to go back to the data to check the reliability of the categories (Elo & Kyngas, 2008).

In this research, using this analysis technique we were able to assess individual accounting policies for recognizing and measuring EAs and GHG emissions as disaggregated, since it was believed that this would answer

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some fundamental questions. These accounting policies are summarized by Elfrink and Ellison (2009) and EFRAG (2012, 2013) as those that, until now, have been discussed by academics, European national regulators and companies that are active participants in the EU ETS. Without this extensive analysis of the content of the Notes presented in the complete set of financial statements, an appropriate level of transparency could not have been achieved.

Information on GHG emissions was obtained from the website of the Union Registry, the most reliable source of data on allocated and verified GHG emissions (Yu, 2013). The report, Verified Emissions for 2014, was used to identify the historical data for each operator/year since 2008, which we added to the respective company/year in accordance with the practices in literature (Ertimur et al., 2017). The final composition of the sample is an unbalanced panel of 85 companies: 540 observations, 352 for IFRS-based financial reporting, and 188 for reporting based on national standards.

Variables

The disclosure indices (*IDs*) are self-constructed, based on the content analysis of annual financial statements; GHG emissions were retrieved from the Verified Emissions Report for 2014, and financial and economic data were taken from annual financial statements and/or the Amadeus database. Exhibit 1 describes the variables, their respective measurements and the sources.

Dependent variables

To measure the level of transparency of the financial reporting of EAs and GHG emissions, the indices constructed are frequently used to reflect on aspects related to environmental activities (Liu et al., 2017; Matsumura, Prakash, & Vera-Muñoz, 2014; Patten, 2002; Steenkamp et al., 2011).

Disclosure indices are the sum of the answers to the questions posed in the literature review, supported by the accounting policies prescribed by national regulators in Portugal, Spain and France (Black, 2013; Lovell et al., 2010; Warwick & Ng, 2012). For this work, content analysis of the Notes was fundamental, as it allowed us to identify individual accounting policies for EAs and GHG emissions, which we compiled in eight items of recognition and measurement: I1 Initial recognition of assigned EAs; I2 Counterpart of initial recognition of assigned EAs; I3 Initial measurement of EAs; I4 Subsequent measurement of EAs; I5 Recognition of GHG emissions; I6 Measurement of GHG emissions; I7 Recognition of over-allocated GHG emissions; and I8 Acknowledgement of EAs acquired to cover GHG emissions over the cap. Each of these eight items was transformed into a dummy variable that takes the value 1 if any categorical information was disclosed, and 0 in cases of non-disclosure, or the disclosure of off-balance sheet policies. These last categories are assumed to be a way of reducing the levels of transparency in the financial reporting of EAs and GHG emissions. The *ID* is the sum of the eight dummy variables (I1 to I8), and a variable that takes the value 0 if no accounting policy was disclosed, and the value 8 if all were identified in the Notes.

In order to distinguish the level of transparency between IFRS and national GAAPs (general accounting plans), two further indices were formulated: ID.IFRS that takes the value 0 if none of the eight items were disclosed on the IFRS basis, and 8 if all of them were; and ID.NGAAP that takes the value 0 if none of the eight items were disclosed using national GAAPs, and 8 if all of them were.

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Exhibit 1. Variable definitions

Variable	Type	Description	Measurement	Source
ID	Dependent variable (Level of Transparency)	Disclosure index	Takes values from 0 to 8 (is the sum of dummy variables I1 to I8)	Notes (Annual Financial Statements)
ID.IFRS		Disclosure index on an IFRS basis		
ID.NGAAP		Disclosure index on a national GAAP basis		
ID.EA	Dependent variable (Level of Transparency – Good news vs Bad news)	Disclosure index of *good* news	Takes the values from 0 to 4 (is the sum of I1 to I4 for EAs, or I5 to I8 for GHG emissions)	
ID.eGHG		Disclosure index of *bad* news		
ID.IFRS.EA		Disclosure index of *good* news in the IFRS		
ID.IFRS.eGHG		Disclosure index of *bad* news in the IFRS		
ID.NGAAP.EA		Disclosure index of *good* news in national GAAP		
ID.NGAAP.eGHG		Disclosure index of *bad* news in national GAAP		
GHGeP	Explanatory variable	GHG emissions' performance	Ratio Net Sales to GHG emissions (in € by metric ton)	Annual Financial Statements / Amadeus database + *Verified Emissions Report for 2014*
Size	Control variables	Size of the company	Logarithm of total assets (in €)	Annual Financial Statements / Amadeus database
ROA		Return on Assets	Ratio EBIT to Total Assets (in €)	
ROE		Return on Equity	Ratio Net Income to Owners' Equity (in €)	
ROS		Return on Sales	Ratio net Sales to Total Assets (in €)	
DebtE		Debt to Equity ratio	Ratio Total Debt to Owners' Equity (in €)	
DebtTA		Debt to Assets ratio	Ratio Total Debt to Total Assets (in €)	
Audit		Presence of auditor's report in annual financial statements	Dummy variable: takes the value 1 if the annual accounts contain an auditor's report, and 0 otherwise	Annual Financial Statements

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The level of transparency of EAs and GHG emissions is also assessed by way of 'good news' and 'bad news': ID.EA related to EAs (I1 to I4) is seen as 'good news'; and ID.eGHG related to GHG emissions (I5 to I8) is seen as 'bad news'. Another four new dependent variables were generated in order to differentiate the levels of transparency of 'good news' and 'bad news' with regard to each financial reporting basis – IFRS and national GAAP: ID.IFRS.EA, ID.IFRS.eGHG, ID.NGAAP.EA, ID.NGAAP.eGHG, take the value 0 if none of the four items were disclosed, and 4 if all of them were.

Independent variables: Treatment and control variables

The ratio between net sales and GHG emissions (value of sales for each unit of GHG emissions) was used as a measure of the performance of GHG emissions. Ehrenfeld (2005) calls it a measure of eco-efficiency because it is the ratio of an economic value added to an environmental impact measure. Previous literature (Busch & Hoffman, 2011; Clarkson, Li, Pinnuck, & Richardson, 2015; Qian & Schaltegger, 2017) uses carbon intensity, the inverted ratio of GHG emissions' performance (GHG emissions to economic value added), which is recognized as an eco-intensity measure (Ehrenfeld, 2005). The GHG emissions' performance ratio was transformed into a logarithm to avoid skewed parameters in accordance with previous literature (Busch & Hoffman, 2011)

With regard to control variables, we expect that size, profitability, financial risk and external supervision are good for controlling the level of transparency, since they represent the characteristics of the company that are often used as an explanatory factor of disclosure (Gallego-Álvarez et al., 2016; Giner-Inchausti, 1997; Veith et al., 2009).

Company size is considered to be a positive influence on the disclosure of information, since it emphasizes that large firms are politically more sensitive and face pressures that smaller entities do not. Clarkson et al. (2008), Prado-Lorenzo, Rodríguez-Domínguez, Gallego-Álvarez and García-Sánchez (2009), Matsumura et al. (2014), Luo, Lang and Tang (2012) conclude that large companies disclose more information related to their GHG emissions. There are several measures to proxy size and we chose the logarithm of total assets, as did Giner-Inchausti (1997) and Gallego-Álvarez et al. (2016).

Profitability measures were often used by previous literature, because companies that perform better can be more transparent about their internal activities, and so profitable entities are expected to present more disclosures to justify their good performance (Roberts, 1992). Several studies simultaneously use return on assets (ROA) and return on equity (ROE) to control for profitability, as ROA reflects operating performance and ROE financial performance (Giner-Inchausti, 1997; Prado-Lorenzo et al., 2009; Qiu, Shaukat, & Tharyan, 2016). Return on sales (ROS) was used because it represents a short-term return (Liu et al., 2017).

Leverage ratios are used to inform about default risks that may lead to investment and financing being avoided. They are often used as a covenant, which encourages managers to adopt accounting policies that avoid an inconvenient outcome (Connors & Gao, 2011; Prado-Lorenzo et al., 2009). Several other measures are also used in the literature, two of which were included in this study: the ratio of debt to equity (Gallego-Álvarez et al., 2016; Ortas et al., 2015; Prado-Lorenzo et al., 2009), and the ratio of debt to assets (Busch & Hoffman, 2011; Luo et al., 2012).

A report by an independent auditor certifies the reliability and relevance of accounting practices related to EAs and GHG emissions, thus lending greater credibility to the financial statements (Dechow, Ge, & Schrand, 2010). The presentation of an external auditor's report is expected to have a positive impact on levels of transparency.

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The Audit variable is a dichotomous variable that takes the value 1 if the annual report incorporates the auditor's report, and 0 if it does not.

Model and econometric analysis

Our econometric model is different from previous literature in that it tries to assess what drives a company to disclose more financial information on exposure to EU ETS transactions. While we cannot directly represent the company's unobservable strategy, we can estimate the following relationship:

$$LevelTransparency_{it} = \int(\text{GHG emissions performance, control variables})_{it}$$

Equation 1 was designed to verify the influence of GHG emissions' performance on the level of transparency of financial reporting.

$$LT_{it} = \beta_o + \beta_1 NT_{it-1} + \beta_2 GEEeD_{it} + \emptyset X_{it} + \varepsilon_{it} \quad (1)$$

Where:

- i and t are respectively company and year;
- LT represents the measures for the level of transparency: ID, ID.IFRS, ID.NGAAP, ID.EA, ID.eGHG, ID.IFRS.EA, ID.IFRS.eGHG, ID.NGAAP.EA, ID.NGAAP.eGHG;
- GHGeP is the logarithm of the ratio of net sales to GHG emissions;
- X corresponds to the control variables: Size is the logarithm of total assets; Profitability: ROA, ROE and ROS; Leverage: debt-to-equity ratio and debt-to-total assets ratio; Audit is a dummy variable for the presence of an independent auditor's report;
- ε is the error term.

To test Equation 1, we employed a regression technique using panel data, which enables us to assess the transparency of the financial reporting over the periods, by analyzing observations from several consecutive years for the same sample companies. Dynamic models have two main advantages (Pindado & Requejo, 2015): they control for unobserved heterogeneity, i.e., individual effects, such as the management's professional judgement about financial reporting, the levels of transparency in the reports, or awareness of GHG emissions; and they help mitigate the endogeneity problem that occurs when the error term is correlated with any of the instrumental variables. The estimator chosen was the Generalized Method of Moments (GMM) system, according to the model developed by Arellano and Bover (1995) that has been applied in previous literature (Abrell , Ndoye, Zachmann, 2011; Yu, 2013). Despite the scarce literature on the relationship in question, we are conscious of the causal relationships in the proposed model. In this sense, endogeneity was addressed by using instrumental variables, which are more commonly expressed as delays of the endogenous variables (Labra & Torrecillas, 2014). As usual in GMM literature, we introduced the first lag of the dependent variable as a regressor, and the lags of the explanatory and control variables as instruments. These lagged values are natural candidates for valid instruments because we can prove them to be uncorrelated with the error term when deriving the estimator. They also contain information on the current value of the variable as there is frequently a delay between the decision made by individuals and its actual realization (Labra & Torrecillas, 2014). Arellano and Bond (1991) argue that using more instruments is

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a way of increasing efficiency, which Pindado and Requejo (2014) conclude to be an adequate strategy for short periods of time. Explanatory and control variables are considered to be endogenous variables. In order to control the heteroscedasticity of the panels we included the robustness option to determine the standard deviation in the model, as suggested by Windjmeier (2005).

RESULTS

Summary statistics are evidence that the level of transparency increased in the case of national GAAPs and decreased for the IFRS basis (see Table 1).

Table 1. **Summary statistics and correlation matrix**

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
ID	540	5,0037	2,8875	0	8
ID.IFRS	352	4,7585	3,0450	0	8
ID.NGAAP	188	5,4628	2,5107	0	8
ID.EA	540	2,8000	1,6268	0	4
ID.eGHG	540	2,2037	1,4682	0	4
ID.IFRS.EA	352	2,6392	1,7040	0	4
ID.IFRS.eGHG	352	2,1193	1,5238	0	4
ID.NGAAP.EA	188	3,1011	1,4275	0	4
ID.NGAAP.eGHG	188	2,3617	1,3472	0	4
GHGeP	540	7,4819	2,1174	3,1761	14,4616
Size	540	19,5453	1,9484	14,4998	24,5375
ROA	540	0,0517	0,1197	-1,2022	0,5791
ROE	540	0,1021	0,3392	-2,8407	4,0087
ROS	540	0,8227	0,5136	0,0082	3,0855
DebtE	540	1,7876	3,2518	-28,0376	33,1463
DebtA	540	0,5549	0,2765	-1,1387	1,5476
Audit	540	0,8407	0,3663	0	1

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The correlation matrix shows that a higher measure of GHG emissions' performance is negatively associated with levels of transparency, although the coefficient indicates that the reduction is not significant, as we expected because of the materiality issues mentioned above (See Table 2).

Table 2. **Spearman's correlation matrix**

	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	***17)***
1) IE	1																
2) ID.IFRS	*0.8417**	*1*															
3) ID.NGAAP	*0.9526**	0.6839*	*1*														
4) ID.EA	*10.000*	0.9056*	0.9608*	*1*													
5) ID.eGHG	0.9056*	1.0000*	0.7923*	0.9056*	*1*												
6) ID.IFRS.EA	*0.9608**	0.7923*	1.0000*	0.9608*	0.7923*	*1*											
7) ID.IFRS. eGHG	*10.000*	0.6121*	0.9440*	--	--	--	1										
8) ID.NGAAP. EA	*0.6121**	1.0000*	0.3698*	--	--	--	0.6121*	1									
9) ID.NGAAP. eGHG	*0.9440**	0.3698*	1.0000*	--	--	--	0.9440*	0.3698*	1								
10) GHGeP	*-0.1940**	-0.1135*	-0.2089*	-0.1998*	-0.1202**	*-0.2179**	-0.2524*	-0.1058	-0.2200*	1							
11) Size	*-0.0367*	-0.0589	-0.0221	0.0213	0.0717	*-0.0002*	-0.2123*	-0.2931*	-0.1130	-0.1744*	*1*						
12) ROA	*0.1671**	0.1040**	0.1728*	0.2560*	0.2004*	*0.2701**	0.0049	-0.1222***	-0.0054	0.3658*	*-0.0704*	1					
13) ROE	*0.1098***	0.0228	0.1300*	0.1663*	0.1186**	*0.1730**	0.0060	-0.2067*	0.0536	0.2240*	*-0.0444*	0.6963*	1				
14) ROS	*0.1427**	0.1482*	0.1390*	0.1918*	0.1901*	*0.1787**	0.0069	-0.0222	0.0466	-0.0602	*-0.2407**	0.1111*	-0.0074	1			
15) DebtE	*-0.0268*	-0.1252*	0.0218	-0.0049	-0.0898*	*0.0127*	-0.1104	-0.1970*	0.0180	-0.0815***	*0.0963***	-0.1296*	0.0185	-0.1259*	1		
16) DebtA	*-0.1036***	-0.2050*	-0.0502	-0.1323**	-0.2189*	*-0.1105***	-0.0762	-0.1722**	0.0541	-0.1319*	*0.1111**	-0.1963*	0.0519	-0.1111*	0.8889*	1	
17) Audit	*0.1102***	0.0613	0.1489*	-0.0383	0.0174	*-0.0262*	0.4243*	0.1715**	0.4783*	0.1389*	*0.0859***	-0.0859**	-0.0573	-0.1718*	-0.1074**	-0.0644	1

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The correlation is higher for levels of disclosure based on national standards, although the index of 'good' news is not statistically significant. Size is negatively correlated with levels of transparency, excluding those based on IFRS, but only significant when national GAAPs are applied. The profitability variables are positively correlated with the levels of transparency in IFRS, and negatively correlated with the level of transparency for 'good' news in national GAAPs. Leverage ratios present negative statistically significant correlations with the level of transparency of EAs, in both IFRS and national GAAPs. Having an auditor's report is positively correlated with the levels of transparency in national GAAPs, and is stronger for the transparency of 'bad' news. The performance of GHG emissions is positively correlated with ROA, ROE and an auditor's report, and negatively correlated with size and leverage (see Table 2).

Tables 2 to 4 show the results for Equation 1. We would point out that adopting off-balance sheet policies was considered equivalent to nondisclosure, as they reduce the level of transparency in the financial report. The total number of observations reduces because of the introduction into the model of the dependent variable with the delay of a period as an explanatory variable.

There is no evidence in the model specification tests of first and second order autocorrelation in the errors of the first difference (ɱ1 and ɱ2), but model 3 in Table 4 is cause for concern as the p-value is at the 10% level. Hansen tests suggest that the instruments are valid, but in Table 6 models 1 and 2 show signs of over-identification, as the p-values of Hansen are 0,734 and 0,803, respectively. The number of instruments used is high for the number of observations, but as it does not exceed the number of groups the models remain valid, although it is weaker. Wald tests provide acceptable results for the joint significance of the explanatory variables, but not efficient results for the control variables. Time dummies are not jointly significant, as we expected considering the consistency necessary in accounting policies in order to achieve comparability.

Table 3 suggests that the effect of the GHG emissions' performance on the transparency level of financial reporting is negative and statistically significant, i.e., companies disclose fewer accounting policies with regard to GHG emissions when the performance of their emissions improves.

Table 3. **Results for the level of transparency – IFRS and national GAAP**

	(1) ID		(2) ID.EA		(3) ID.eGHG	
	Coef.	**Std. Er.**	**Coef.**	**Std. Er.**	**Coef.**	**Std. Er.**
DepVar t-1	0.2655**	0.1043	0.3003*	0.0883	0.3123***	0.1708
GHGeP	-0.3643***	0.2059	-0.0858	0.0982	-0.2263***	0.1334
Size	0.6457	0.5301	0.4704**	0.2029	0.1942	0.3439
ROA	0.0791	0.1762	0.0404	0.0962	0.0423	0.0839
ROE	-0.2126	0.1484	-0.1297	0.0832	-0.0311	0.0893
ROS	0.5016***	0.2589	0.2062	0.1474	0.1292	0.1574
DebtE	0.3523	0.3266	0.2648	0.2040	0.1902	0.1670
DebtA	-0.2685	0.3834	-0.1793	0.2540	-0.1487	0.2081
Audit	2.7846**	1.3441	1.6633**	0.6688	0.8996	0.7069
_cons	2.0628	1.4832	--	--	1.7351***	0.9506
i.Year	Yes(1)		Yes(1)		Yes(1)	

Continue

Table 3. **Results for the level of transparency – IFRS and national GAAP** Concludes

	(1) ID		(2) ID.EA		(3) ID.eGHG	
	Coef.	**Std. Er.**	**Coef.**	**Std. Er.**	**Coef.**	**Std. Er.**
N.obs / N.groups	453/85		453/85		453/85	
N instruments	56		56		54	
F statistic	4.19*		90.05*		2.14*	
mj1	0.034		0.018		0.036	
mj2	0.882		0.507		0.236	
Hansen J statistic	chi2(39)=43.48 Prob>chi2= 0.286		chi2(39)=42.56 Prob>chi2= 0.320		chi2(37)=42.56 Prob>chi2= 0.164	
z1	F(2.84) = 7.91*		F(2.84) = 6.13*		F(2.84) = 5.81*	
z2	F(7.84) =2.50**		F(7.84) =5.05*		F(7.84) =0.87	
z3	F(5.84) = 0.20		F(6.84) = 0.67		F(6.84) = 1.16	

Table 4 confirms that the level of disclosure reduces when the GHG emissions' performance increases, whether with regard to EAs or GHG emissions. Model 2 also suggests that it is larger entities that, all things being equal, reduce the level of transparency in the financial reporting of their EAs under IFRS.

Table 4. **Results for the level of disclosure in IFRS**

	(1) ID.IFRS		(2) ID.IFRS.EA		(3) ID.IFRS.eGHG	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
DepVar t-1	0.1936	0.1665	0.5889*	0.1786	0.3339	0.2158
GHGeP	-0.4338***	0.2465	-0.2074*	0.0761	-0.1346***	0.0756
Size	-0.0929	0.5329	0.3217***	0.1836	-0.3111	0.2026
ROA	0.1217	0.3077	0.0489	0.0644	0.0414	0.0638
ROE	0.0761	0.2393	0.0342	0.0860	0.0646	0.0772
ROS	-0.0952	0.4520	-0.0200	0.0769	-0.0637	0.0867
DebtE	0.5209	0.4289	0.0519	0.1625	0.1216	0.1510
DebtA	-0.5422***	0.3069	-0.0220	0.1785	-0.0799	0.1611
Audit	-0.8406	1.1412	0.2052	0.2230	-0.4594	0.6386
_cons	--		1.5732***	0.8551	--	
i.Year	Yes(1)		Yes(1)		Yes	
N obs / N groups	296/55		296/55		296/55	
N instr.	52		36		36	
F statistic	34.16*		3.26*		21.36*	

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Table 4. **Results for the level of disclosure in IFRS**

Concludes

	(1) ID.IFRS		(2) ID.IFRS.EA		(3) ID.IFRS.eGHG	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
mj1	0.076		0.022		0.082	
mj2	0.476		0.270		0.100	
Hansen J statistic	chi2(35)=29.42 Prob>chi2= 0.734		chi2(19)=13.67 Prob>chi2= 0.803		chi2(19)=17.62 Prob>chi2= 0.548	
z1	F(2.54) = 3.25**		F(2.54) = 10.50*		F(2.54) = 4.50**	
z2	F(7.54) =0.71		F(7.54) =0.90		F(7.54) = 0.73	
z3	F(6.54) =1.322		F(6.54) = 0.99		F(6.54) = 2.96**	

Table 5 suggests that there is no statistically significant influence of the GHG emissions' performance on the levels of transparency in financial reporting when these are based on mandatory accounting standards. A relationship was found between ROA and ROE and the national accounting-based levels of transparency of GHG emissions. The levels of transparency in national GAAPs are also positively influenced by the presence of an external auditor's report.

Table 5. **Results for the level of disclosure in national GAAPs**

	(1) ID.NGAAP		(2) ID.NatGAAP.EA		(3)ID.NGAAP.eGHG	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
DepVar t-1	0.5888*	0.1989	0.7207*	0.1826	0.7700*	0.1844
GHGeP	-0.0725	0.2865	0.0168	0.1221	-0.0688	0.1158
Size	0.3506	0.5868	0.1278	0.2745	0.1454	0.1531
ROA	0.3478***	0.1779	0.0919	0.2243	0.3647**	0.1338
ROE	-0.4269***	0.2170	-0.0382	0.2037	-0.4509*	0.1356
ROS	0.1300	0.4087	0.1332	0.2627	-0.0772	0.1424
DebtE	0.5801	0.7682	0.2963	0.5342	0.3178	0.2405
DebtA	-0.3738	0.8781	-0.3692	0.5503	-0.1754	0.2916
Audit	3.2818*	1.0177	1.3729***	0.7905	1.1530*	0.4060
_cons	-0.8177	1.3353	--		-0.0321	0.9500
i.Year	Yes(1)		Yes(1)		Yes(1)	
N obs/ N groups	157/30		157/30		157/30	
N instruments	27		27		27	
F statistic	63.54*		132.39*		63.01*	

Continue

Table 5. **Results for the level of disclosure in national GAAPs**

Concludes

	(1) ID.NGAAP		(2) ID.NatGAAP.EA		(3)ID.NGAAP.eGHG	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
m1	0.043		0.106		0.029	
m2	0.187		0.425		0.859	
Hansen J statistic	chi2(11)=14.68 Prob>chi2= 0.197		chi2(10)=15.39 Prob>chi2= 0.118		chi2(11)=11.74 Prob>chi2= 0.384	
z1	F(2.29) = 4.60**		F(2.29) = 7.79*		F(2.29) = 14.83*	
z2	F(7.29) = 7.49*		F(7.29) = 0.89		F(7.29) = 6.82*	
z3	F(5.29) = 0.80		F(6.29) = 0.52		F(5.29) = 1.32	

By using a model that controls for endogeneity and considers a weight matrix that is heteroscedastic, the relational level between transparency and the GHG emissions' performance is verified mainly for the transparency of GHG emission policies. We also concluded that an increased eco-efficiency measure of GHG emissions reduces the levels of transparency in IFRS, i.e., an accounting regulation that does not have a specific accounting treatment, but is recognized as being of high quality (Barth & Schipper, 2008).

Evidence also showed that the level of transparency related to EAs increases in the presence of a lower eco-efficiency. This is evidence that in cases in which GHG emissions are more intense, the completeness of financial reporting is improved by providing 'good news'. Hence, as Luo et al. (2012) and Gallego-Álvarez et al. (2016) argued, by using accounting companies can present a more positive light with regard to their GHG emission practices, especially in countries where companies are subjected to market trading. The relationship between the GHG emissions' performance and the levels of transparency in financial reporting, however, should be more visible, since the purpose of a market instrument is precisely to force companies to include the 'cost of polluting' in their financial reports, and to allocate a value to it (Ascui & Lovell, 2012). The lack of regulations from the IASB seems to be allowing company financial reporting to manage the impression of the performance of their GHG emissions, by reporting more EA policies when GHG emissions are more intense.

On the other hand, accounting regulation has been a factor that is often mentioned as leading to an increase in disclosure and is a guarantee of the information needed by stakeholders (Giner-Inchausti, 1997, 2014). We were unable to provide empirical evidence for this because national GAAPs do not distinguish the role of GHG e missions' performance in transparency levels. Veith et al. (2009) also argued about the decision-usefulness of gross approaches, which are the nature of prescribed national financial reporting.

The transparency of the GHG emissions' performance questions the financial disclosure that reflects the economic substance of the transactions and provides some comparability, as better performances reduce IFRS-based disclosure. However, because of the reduced coefficient we agree with Freedman and Jaggi (2011) that the results do not realistically reflect the amount of GHG emissions, which should affect the levels of transparency in financial reporting. Greater GHG emissions should lead to an increase in general financial transparency, which we also did not asses s. As such, clearer guidance is needed to empower stakeholders with more visible information on exposure to EU ETS.

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CONCLUSIONS

This study aims to provide evidence of the influence of the performance of GHG emissions on the level of transparency in financial reporting. There are few such studies, because data on the subject are difficult to obtain and relate. This is true for both financial data, since the accounting treatment of EAs and GHG emissions requires an analysis of qualitative financial information, and the quantitative data in the GHG emissions figures that are self-reported. This is a critical question as it is fundamental for analyzing the financial reporting response of all polluters, and not just high pollution emitters, because market mechanisms are specifically for the purpose of making pollution effects observable; transparency in financial reporting may be the solution to this. This research highlighted the focus on transparency in financial reporting that should include the underlying economics of EU ETS transactions and, therefore, reflect the eco-efficient measurement of the performance of GHG emissions. The findings support the fact that the performance of GHG emissions is negatively related to the levels of transparency in IFRS-based financial reporting. We were also able to verify that IFRS companies, with no specific principles to apply to these matters, choose to disclose 'good news' related to EAs when their GHG emissions' performance reduces. We also suggest that the levels of transparency in financial reporting are differently influenced by the GHG emissions' performance when the presentation basis of financial statements incorporates a specific accounting treatment. It was not possible, however, to provide empirical evidence for this, which raises doubts as to whether the gross approach adopted by national regulators is internalizing GHG emission costs as the EU ETS intended. As a result,, this line of study will need to be continued in the future.

A note of caution is needed because of the inherent limitations of the study. The use of content analysis may result in bias, since it is sometimes necessary to make subjective judgements, which was true when assessing the levels of transparency and for cross-referencing the verified emissions' file with the reporting entity. We also acknowledge that the use of all the companies listed in the NPA with available annual financial statements may potentially include information that is lacking in materiality, which increases the adoption of non-disclosure and non-recognition policies.

Despite the above limitations, the GHG emissions' performance and regulatory requirements seem to be the only way of achieving more transparent financial reporting and improving pollution disclosure. This highlights the discrepancies between applying a standard with specific principles for EU ETS transactions, which is of interest to those responsible for preparing financial reports, such as regulators, managers and accountants. It is also of interest to those that have an interest in the completeness of financial reporting, which underlies the importance of the economics of the transactions.

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AUTHORS' CONTRIBUTIONS

Patricia Milanés-Montero, Esteban Pérez-Calderón and Ana Isabel Dias worked on the conceptualization and theoretical-methodological approach. The theoretical review was conducted by Esteban Pérez-Calderón, and Patricia Milanés-Montero. Data collection was coordinated by Ana Isabel Dias. Data analysis included Ana Isabel Dias, Esteban Pérez-Calderón, and Patricia Milanés-Montero. Patricia Milanés-Montero, Esteban Pérez-Calderón, and Ana Isabel Dias worked together in the writing and final revision of the manuscript.

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TRANSFORMATION OF FREE AND OPEN SOURCE SOFTWARE DEVELOPMENT PROJECTS: GOVERNANCE BETWEEN THE CATHEDRAL AND BAZAAR

Transformação de projetos de desenvolvimento de software livre: Uma governança entre a catedral e o bazar

Transformación de proyectos de desarrollo de software libre: Una gobernanza entre a catedral y o bazar

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ABSTRACT

It is common for community-based free software projects to be associated with an organizational scenario that resembles "a bazaar more than a cathedral," and to differ from the traditional, or 'bureaucratic' way of organizing work. This paper analyzes the governance of these organizations from the perspective of their structure and control, considering the development trajectory of three community-based free software projects in Brazil. Results show that the constant need to produce modern technologies gives rise to external pressures that promote change - albeit temporary - in the governance of these projects, making them resemble a cathedral more than a bazaar. Governance does not follow a cycle of sequential improvement; it changes depending on the external organizational actors present, such as sponsors. This suggests the need for strategic and flexible governance to deal with the acquisition and allocation of organizational resources. Governance of the projects described here varies along a spectrum of (in)formality that allows both production models - cathedral or bazaar - to exist in the same organization at different periods.

KEYWORDS | Community, free software projects, governance, structure, control.

RESUMO

Comumente, projetos de software livre comunitários são associados a um cenário organizacional que se assemelha mais "a um bazar do que a uma catedral", diferenciando-se da maneira tradicional ou "burocrática" de organizar o trabalho. Este artigo analisa a governança dessas organizações, pela perspectiva da estrutura e do controle, considerando a trajetória de desenvolvimento de três projetos de software livre comunitários brasileiros. Os resultados mostram que a constante necessidade de produzir tecnologias modernas gera pressões externas que promovem mudanças, especialmente temporárias, na governança desses projetos, fazendo-os parecer mais uma catedral do que um bazar. Além disso, a governança não segue um ciclo sequencial de aprimoramento, modificando-se na presença de atores organizacionais externos como patrocinadores. Isso sugere a necessidade de uma governança estratégica e flexível para lidar com a aquisição e alocação de recursos organizacionais. Teoricamente falando, a governança dos projetos aqui descritos varia ao longo de um espectro de (in)formalidade que permite que ambos os modelos de produção – catedral ou bazar – existam na mesma organização, em momentos distintos.

PALAVRAS-CHAVE */ Comunidade, projetos de software livre, governança, estrutura, controle.*

RESUMEN

Es común que los proyectos de software libre comunitario se asocien con un escenario organizacional que se asemeja "a un bazar más que a una catedral" y se diferencien de la forma tradicional o "burocrática" de organizar el trabajo. Este artículo analiza la gobernanza de estas organizaciones, desde la perspectiva de la estructura y el control, considerando la trayectoria de desarrollo de tres proyectos de software libre comunitario brasileños. Los resultados muestran que la necesidad constante de producir tecnología moderna genera presiones externas que promueven modificaciones, aunque temporales, en la gobernanza de estos proyectos, haciéndolos parecer más una catedral que un bazar. Además, la gobernanza no sigue un ciclo de mejora secuencial, cambia dependiendo de los actores organizacionales externos presentes, como los patrocinadores. Esto sugiere la necesidad de una gobernanza estratégica y flexible para hacer frente a la adquisición y asignación de recursos organizacionales. La gobernanza de los proyectos descritos aquí varía en un espectro de (in)formalidad que permite que ambos modelos de producción - bazar o catedral - existan en el mismo proyecto, en diferentes momentos.

PALABRAS CLAVE */ Comunidad, proyectos de software libre, gobernanza, estructura, control.*

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INTRODUCTION

Advances in information and communication technology (ICT) and its diffusion, combined with increasing environmental complexity (Seidel & Stewart, 2011; Zebari, Zeebaree, Jacksi, & Shukur, 2019), have facilitated the emergence of modern and flexible organizations, which present themselves in a multitude of 'configurations' known as virtual communities (Arazy, Daxenberger, Lifshitz-Assaf, Nov, & Gurevych, 2016; Faraj, Jarvenpaa, & Majchrzak, 2011). A widespread example of a venture that is based on a virtual community format is free software projects (Li-Ying & Salomo, 2013; Seidel & Stewart, 2011). These communities are represented by projects that are created on the Internet, in which the program's source code is made publicly available to receive the external contributions of users and developers through the significant participation of volunteers (Eseryel, Wei, & Crowston, 2020; Santos, 2010; Seidel & Stewart, 2011; Shah, 2006).

It is common knowledge that virtual communities, such as free software projects, are organized in a manner that is different from traditional organizations (Arazy et al., 2016; Lee & Cole, 2003; Miscione, Ziolkowsk, Zavolokina, & Schwabe, 2018; Seidel & Stewart, 2011). In the metaphor used by Raymond (1999, 2005) with regard to the community model of production, free software projects are seen as bazaars, with their informal way of working, while traditional organizations are perceived as cathedrals, which function by way of a formalized structure and control processes.

Studies of free software need to detail the specificity of the operations (Bauer, Franke, & Tuertscher, 2016) in order to understand how, in the absence of formal means, or the minimal presence of the same, communities conduct their operations and achieve results (Arazy et al., 2016; Eseryel et al., 2020; Miscione et al., 2018; Panchal, 2010). A pivotal concept for verifying how work is performed in organizations is governance, which is multidimensional and involves formal and informal means for directing the actions of individuals (Li-Ying & Salomo, 2013; Markus, 2007).

It is clear from the literature on free software that although it is usual to differentiate between the characteristics of communities and traditional organizations (Arazy et al., 2016; Lee & Cole, 2003; Seidel & Stewart, 2011), authors do not always consider the changes in projects and their development in this differentiation. As a result, mature, free software projects may be regarded as businesses that pursue an informal management logic instead of adopting a traditional organizational model (Demil & Lecocq, 2006; Markus, 2007; Raymond, 2005). This can be noted in studies such as those by Lee and Cole (2003), Shah (2006), Seidel and Stewart (2011), and Lindberg, Berente, Gaskin, and Lyytinen (2016). They cite successful projects, but without analyzing the changes that occurred in them over time. While works by Lattemann and Stieglitz (2005), Xu, Xu, and Lin (2005), and Panchal (2010) acknowledge the existence of different stages of development in free software initiatives, these authors do not conduct any empirical examinations, or reach any practical conclusions.

Given these considerations, a greater understanding of how free software projects conduct actions during their development is necessary (Forte & Lampe, 2013; Guimarães, Korn, Shin, & Eisner, 2013). This research aims to answer the following question: *In terms of structure and control, how does governance appear and transform itself in developing community-based free software projects?* It also analyzes these projects from the perspective of organizational theory and approaches that involve dependence on resources, stakeholders and temporary organizations. This qualitative study uses the case study strategy to focus on three community-based free software projects. The idea is to bring a dynamic view that enables researchers and professionals to understand the main drivers of change in governance during the development of free software businesses. This will enable verification of whether communities (bazaars) differ from traditional organizations (cathedrals) or are similar to them.

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LITERATURE REVIEW

Governance in community-based free software projects

Free software communities retain all the essential features of a virtual community, where geographically dispersed members, who are mainly volunteers, work and collaborate in flexible ICT-mediated virtual spaces (Eseryel et al., 2020; Faraj et al., 2011; Seidel & Stewart, 2011; Shah, 2006). These communities differ from those that produce software commercially, because they are structures that promote the free use of software and make its source code freely available on the Internet (Miscione et al., 2018; Santos, Kuk, Kon, & Pearson, 2013; Seidel & Stewart, 2011). Such free software communities have been active in producing competitive and innovative products (Bauer et al., 2016; Viseur & Charleux, 2019).

According to Markus (2007), governance in the context of free software communities is represented by the formal and informal means that enable individuals, who are wholly or partially autonomous, to contribute jointly to a software development project. Despite the importance of governance in free software enterprises, studying it is still a controversial topic (Li-Ying & Salomo, 2013), mainly because a significant portion of research considers such communities to be arrangements that are marked by informal management, which differentiates them from the hierarchical and formal logic of traditional organizations (Eseryel et al., 2020; Seidel & Stewart, 2011). While recognizing such characteristics, however, other studies have argued that the governance mechanisms used by free software communities are quite flexible, so they can be modified over time (Lattemann & Stieglitz, 2005; Li-Ying & Salomo, 2013; Mäenpää, Munezero, Fagerholm, & Mikkonen, 2017; Viseur & Charleux, 2019; Xu et al., 2005).

This particular research began by assuming an understanding of governance to mean something that is carried out dynamically considering the development trajectory of community-based free software projects. Among the multiple prisms by which governance can be studied, two are analyzed in this study: structure (Lindberg et al., 2016; O'Mahony & Ferraro, 2007; Seidel & Stewart, 2011) and control processes (Lattemann & Stieglitz, 2005; Xu et al., 2005).

Structure and the control of community-based free software projects

From a structure perspective, free software communities differ from traditional organizations because of the absence of a central hierarchy and authority (Lee & Cole, 2003; Miscione et al., 2018; Panchal, 2010). These communities adopt a perspective in which power is established horizontally because individuals do not move vertically, but from the periphery towards the center of the project. Participants at the center, therefore, are regarded by others to be project connoisseurs and the most trusted decision makers (Dahlander & O'Mahony, 2011).

Roles in free software communities are not specialized, since exercising them is not previously designated, and occurs during the collaborative work process itself (Arazy et al., 2016; Lee & Cole, 2003). Overlaps in performing tasks are expected, and explain the contributors' participation in several functions within the project (Lee & Cole, 2003; Seidel & Stewart, 2011). Even though there are no deliberately specified roles in projects, the exercise of leadership is often well defined (Lee & Cole, 2003). Leadership is seen as a condition for a project's success as the leader assumes responsibility for the various subsystems and makes critical decisions regarding source codes and business directions (Forte & Lampe, 2013; Guimarães et al., 2013; Mäenpää et al., 2017).

With regard to the decision-making process, the literature on free software communities lists different approaches. Paradoxically, while assuming that the most impactful decisions focus on the collective's authority

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(Lee & Cole, 2003; Seidel & Stewart, 2011; West & O'Mahony, 2005), it is suggested that community members have greater independence when carrying out their activities. This is not only because of their physical distance from each other, but also because communities are non-hierarchical groups mainly comprising volunteers (Panchal, 2010; Seidel & Stewart, 2011).

From the control perspective, although formal result- and behavior-oriented means can are found in free software communities (O'Mahony & Ferraro, 2007), the most common understanding is that it is the informal means, such as self-control, and social and peer control, that stand out (Jensen & Scacchi, 2010; Kolbjørnsrud, 2016; Lattemann & Stieglitz, 2005; Xu et al., 2005). Social control in free software projects seeks to strengthen the sense of belonging to the community that is based on intensive socialization and cultural assumptions. This control involves sharing the objectives and values that aim to achieve the behavioral orientation of individuals (Lattemann & Stieglitz, 2005; Xu et al., 2005).

With regard to self-control, those technology platforms that support community practices and allow individual contributions with high levels of collaboration emphasize autonomy and independence in doing the work, thus reducing coordination efforts (Crowston, Wei, Howison, & Wiggins, 2012; Lindberg et al., 2016). Project leadership plays an essential role in establishing self-control, especially when selecting members and the work to be done (Xu et al., 2005). Peer control is an alternative for guaranteeing the quality of the applications that are produced by free software communities (Kolbjørnsrud, 2016; Lattemann & Stieglitz, 2005). Its purpose is to enable other people to review the work done by an individual, which give rise to criticism of the work of others that is used for correcting mistakes, solving problems, and promoting improvements and an exchange of knowledge (Lee & Cole, 2003).

Structure and control transformations

Even though it is possible to describe the attributes of community enterprises in their organic form (Arazy et al., 2016; Seidel & Stewart, 2011), the fact that free software initiatives undergo successive transformations justifies contextualizing them in relation to the development they achieve (Faraj et al., 2011; Mäenpää et al., 2017). Authors such as Wynn (2003), Lattemann and Stieglitz (2005) and Xu et al. (2005) pointed out that such initiatives undergo successive phases of development (introduction, growth, maturity, and decline, or revival) that affect governance.

Although some authors, such as Raymond (1999, 2005), have claimed that the work of free software projects is similar to the logic of a "bazaar", in which participants are volunteers who are organized in a non-hierarchical and informal way (as opposed to the cathedral view of the organization, i.e., hierarchical and formal), such ventures are dynamic and may change over time. It is believed that the structure and control processes may arise from a more informal context and incorporate formal elements as these projects develop (Forte & Lampe, 2013; O'Mahony & Ferraro, 2007; Panchal, 2010).

A factor that may contribute to this formalization and affect governance has to do with the presence of other organizational actors in community activities, such as sponsors and foundations (Mäenpää et al., 2017; Viseur & Charleux, 2019; West & O'Mahony, 2005). This rather formal functioning of community-based free software initiatives, however, needs to be better understood, and it has led researchers to question some of the accepted ideas about how these communities work and organize their activities (Shaikh & Vaast, 2016).

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Theoretical and conceptual organizational contribution

The stakeholder approach

According to Freeman (2010), stakeholders are individuals or groups of individuals who can influence the specific performance of organizations, including their management procedures and objectives. Since the concept of stakeholders was first presented in 1984 in Strategic Management: The Stakeholder Approach by the above author, it has been widely used in organizational studies. This approach has different definitions and forms of evaluative measurement.

Although the stakeholder approach has been widely used in studies involving private corporations, it is being increasingly used in analyses of public and nonprofit organizations, mainly because of concerns with regard to allocating resources and serving groups more effectively (Bryson, 2018). It is also common for the stakeholder approach to be used in conjunction with other organizational theories (Frooman, 1999).

Regardless of the context or the theory allocated to the stakeholder approach, the organization must be understood as a cluster of actors who focus on common problems that involve managing interests and points of view that are not always convergent (Friedman & Miles, 2006). This should be perceived as a two-way street, as stakeholders and organizations suffer reciprocal influences. This approach also deals with managing contradictions and conflicts that arise between individuals and/or groups, and seeks to solve them (Friedman & Miles, 2006; Frooman, 1999).

Resource dependence theory

Pfeffer and Salancik's 1978 seminal work, *The external control of organizational: a resource dependence*, consolidated the resource dependence theory (RDT). The RDT considers that external factors influence the behavior of organizations (Pfeffer & Salancik, 2003). But while it recognizes the interrelation between the organization and the context, the RDT produces a more proactive conception of the venture, as managers, employing various tactics, can reduce uncertainties, risks and dependencies (Hillman, Withers, & Collins, 2009).

Given the interdependence between organizations and the environments in which they operate, businesses can reconfigure their internal structure to meet current demands and use various strategies to secure the resources they need to survive and be competitive (Sharif & Yeoh, 2014). This role of providing and ensuring relevant resources usually rests with the person in charge of managing the organization (Sharif & Yeoh, 2014).

The wide range of formal or informal actions carried out by managers has the primary purpose of securing essential means, increasing the power in exchange relations, and reducing subordination and the uncertainties that enterprises face (Pfeffer & Salancik, 2003). According to Pfeffer (1988), one of the primary arguments of the RDT is that organizations are not autonomous. There is interdependency with other organizations, which means that the uncertain and survival-oriented actions of companies need to be managed. In short, the three ideas central to the RDT are that: social context is relevant; organizations need strategies in order to seek greater autonomy and to serve their own interests; and power is essential for understanding the internal and external actions of organizations (Davis & Cobb, 2010).

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Temporary organizations

Temporary organizations (TOs) are represented by groups of interdependent actors formed to accomplish a complex task (Burke & Morley, 2016). Definitions of the concept converge when they state that TOs have a termination point that is fixed at a specific date, or they achieve a predefined state or condition (Bakker, 2011; Bakker, Cambré, & Provan, 2009).

TOs are vital-task-oriented (Bakker, 2011), especially those characterized by the complexity arising from their interdependencies, the ambiguity of their interests and the uncertainty of the outcomes (Bakker, 2011; Burke & Morley, 2016). Because of these characteristics, TO teamwork needs to be coordinated, and the leader's role is regarded as crucial (Bakker, 2011). TOs are intrinsically related to the external environment, which is represented by the organizational context and the broader social environment, encompassing relationships with other organizations. The primary resources necessary for the survival of TOs are found in the external environment (Grabher, 2004). Such intertwining with context may become a dilemma for TOs, because while such structures seek autonomy, they also need to acquire the resources necessary for operating (Burke & Morley, 2016).

Traditionally, TOs were understood as complementary arrangements to permanent organizational structures. In a later framework, alternative configurations, such as interorganizational projects and project-based organizations, were included as representative of TOs (Bakker, 2011; Burke & Morley, 2016). This type of organization may take many forms that surpassing intra- and interorganizational collectives, also involving groups that cooperate and integrate resources and expertise to achieve results (Sydow, Lindkvist, & DeFillippi, 2004).

METHOD

This qualitative paper used a case study strategy to examine the free software sector in three main phases. The first phase involved choosing the projects to be studied. The researchers mapped out competitive Brazilian projects that were indicated by researchers and professionals working with free software, and investigated projects that had participated in events in Brazil. Selection criteria were subsequently applied. Based on the works of Xu et al. (2005), Latterman and Stieglitz (2005), Panchal (2010), and Viseur and Charleux (2019), the intention was to identify Brazilian projects with possible variations in their governance and development profiles. These projects varied in terms of the following characteristics: the year they first appeared; the number of software versions; the number of committers (developers with the ability to modify the source code repository); the license used; and the presence of foundations or sponsors. This process led to three projects being selected: CoGrOO, Noosfero and Kytos.

The second phase covered data collection. Interviews were scheduled by e-mail and conducted in person, using Skype or Google Hangouts, when a previously tested semi-structured script was applied. This script was tested on five Brazilian participants who manage free software projects.

The selection of respondents was intentional and included leaders, developers, and stakeholders involved in the core group of projects. The first respondents were key informants with knowledge of the project's history, and the others were selected using the snowball technique. The research did not use theoretical saturation to establish the number of interviews. The concern was to have the history of the projects recounted by individuals who knew their reality and occupied different roles, as defined by structural sampling (Shah & Gorbatai, 2015). Fourteen interviews were carried out. In the case of CoGrOO, the history of the project at a given moment in time

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had an interface with the global Apache OpenNLP project. This situation required complementary data to be collected. Any information that was not obtained from interviewing the key informants, or from documents was supplemented by questions in e-mail form that were sent to participants of the Apache OpenNLP project. Five forms were sent out, and two were answered.

The document search was used to map possible free software projects for inclusion in the study and to obtain complementary data to those collected in the interviews. The contents of e-mail lists, websites, and various documents (slides, reports, manuals, and news articles) were, accessed and organized in a spreadsheet.

Table 1. **Selection criteria of projects**

Project	Year of appearance	No. of versions	No. of committers	License	Foundation / Sponsorship	No. of interviews
Kytos	2014	3	6	MIT	Sponsorship	5
CoGrOO / Apache OpenNLP	2003 / 2000	17 / 34	3 / 23	Apache License 2.0	Foundation	3 + 2 forms
Noosfero	2007	191	12	GNU AGPLv3	Sponsorship	6

In the third phase, the data collected during the interviews and from the document search were transcribed and treated using the content analysis technique (Bardin, 2010), supported by Atlas.ti software. The text was coded in accordance with indicators that refer to each of the categories of analysis previously established, based on a review of the literature. Although the analysis categories were derived from the literature, this did not prevent us from making discoveries during the field research.

Exhibit 1. **Categories of analysis defined from the literature**

Concepts		Dimensions		Indicators
Governance	**Structure**	Hierarchy		Line of authority, subordinate relationships.
		Role specialization		Distribution of roles and responsibilities, division of labor.
		Centralization		Decision focused on a particular individual or organizational level.
	Control	Formal (behavior and results)		Standardization, rules, regulations, rewards based on individual results.
		Informal	Social	Shared culture and practices, socialization of individuals.
			Peer Control	Mutual adjustment, critical of peer work.
			Self-control	Independence in carrying out the work.
Organizational theories / approaches		Resource dependency		Search for resources in the environment.
		Stakeholders		Relationships with internal and external actors.
		Temporary organization		Task orientation, specific completion point.

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ANALYSIS OF RESULTS

It is important to note that the CoGrOO project differs from other projects because its source code is coupled with the OpenNLP project, which is currently part of the Apache Foundation. This second project, therefore, was also considered in the analysis.

Case history

CoGrOO

The CoGrOO project is a grammar checker that can be coupled to OpenOffice.org. It assists in text writing by verifying whether the grammar is correct using natural language processing (NLP). The CoGrOO project started in 2003, when a university professor, who at the time worked at the National Business Learning Service (*Senac-SP*), noted the need to create a grammar checker for OpenOffice.org. Together with other faculty colleagues at the University of São Paulo (USP), this professor designed a project to develop software for this purpose, called CoGrOO.

Between 2004 and 2006, CoGrOO received funding from the Free Software grant facility of *Finep* (Studies and Project Funding Agency). The financial support provided by *Finep* made it possible to offer internship and undergraduate scholarships for developing the software, which was fundamental to the preparation of the initial versions of the grammar checker. When funding came to an end, there was a period in which CoGrOO kept working by way of volunteers and institutional support from the University of São Paulo (USP), which involved an interface with the university's research work and its academic courses. Some of the facts that occurred during this period are worth mentioning: grants were obtained from the Google *Summer of Code* program; the language code was supplied by Google; the CoGrOO community portal was developed on a graduate course at USP; and the software was incorporated by the FLOSS Competence Center at USP (CCSL/USP).

Even though CoGrOO has become a national benchmark, the software community is facing a challenge to stay active because of the loss of resources needed for sustaining the project, and the constant withdrawal of volunteers. One of the members who joined the community as an intern, however, and later volunteered was interested in continuing the project. Around 2011 this developer noted that another project in which he participated, the OpenNLP, had important interfaces with CoGrOO, even though it was not intended for end-users. As a result and on his initiative, about 90% of the CoGrOO code has been incorporated into OpenNLP by way of a patching process. By transferring the code, and because since 2011 OpenNLP has been an Apache project, the management of this code now has that foundation's infrastructure also, which continues today.

Noosfero

The Noosfero project is a web platform for social and solidarity economy networks. In addition to social networking's standard features, the project offers a content management system (CMS). The software originated in 2017 and was developed by the Cooperative of Free Technologies (*Colivre*), which aimed to meet the similar demands of the cooperative's two customers.

Although it arose in the context of commercial demand and was free software, it attracted the attention of external actors, which led to other organizations carrying out projects that used the software to develop their own websites. The existence of parallel projects has brought a specific dynamic for improving the Noosfero community.

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In this sense, while the projects were carried out to meet a given organization's interests, free software supporters who voluntarily participated in these projects were concerned with returning the code that was developed to the Noosfero community. Among the institutions that acted in these initiatives, the following stood out: the Association of Free Software Brazil (*ASL*), the FLOSS Competence Center (CCSL/USP), the Federal Data Processing Service (*Serpro*), the Ministry of Planning, Development and Management (*MP*), and the University of Brasilia (UnB). In some of these projects there were partnerships between the abovementioned institutions and members of *Colivre*.

Even with these parallel initiatives, since the beginning of Noosfero, software development has always been linked to *Colivre* sponsorship. To date, the cooperative's contracts have enabled funds to be invested in the project, which means that *Colivre* continues to play a leading role in managing the project, launching new versions of the software, and reconciling the actors' multiple interests.

Kytos

Kytos is a free platform developed by the Scientific Computing Nucleus (*NCC*) team from the Universidade Estadual Paulista (*Unesp*) in partnership with the São Paulo Research and Analysis Center (SPRACE). This project aims to facilitate the development and implementation of software-defined networks (SDN). The *NCC* plays a significant role in instrumentation projects, hardware and computer networks. It has both Brazilian and international partnerships in the area, particularly with the following actors, to name but a few: National Education and Research Network (*RNP*), Academic Network at São Paulo (ANSP), California Institute of Technology (Caltech), Conseil Européen pour la Recherche Nucléaire (CERN), and Americas Lightpaths (AmLight). These relationships enable *NCC* members to undertake joint projects and participate in various events in Brazil and abroad.

Kytos came about when one of the *NCC* members participating in an overseas event had a chance to assist a demonstration, transfer data using free SDN controllers, and identify a number of limitations in these controllers. In 2014, by way of joint work between the *NCC* team and developers from Caltech, this member began developing a free library called python-openflow. The creation of this library was the first step towards the beginning of the Kytos project.

One of the key events that drove Kytos's development happened at the end of 2015 when the company received sponsorship from Huawei. This Chinese company has invested financial and material resources in Kytos through the Informatics Law, which has even enabled interns to be hired to assist with the development of the software. The initially created library has become a separate repository and is currently a subproject covered by the SDN Kytos platform macro-project. To date, Kytos has continued to be supported by *NCC* and Huawei, as well as by volunteer work being done by partner organizations.

Structure

With regard to physical and technological infrastructure, all projects began at some point to function within an institutional context. The existence of these organizations around projects shows that institutional support is a fundamental factor for making the basic physical and technological infrastructure available. According to the interviewees, the projects use ICT resources intensely due to the opening up of the software by the community and the geographic dispersion of individuals (Bauer et al., 2016; Shah, 2006; Seidel & Stewart, 2011). ICT includes source code hosting and version control platforms for software, such as GitHub, GitLab and Sourceforge; chat and video platforms, in particular Google Hangouts; team collaboration tools such as Slack; mailing lists; and home

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pages used to disseminate project information. It is important to underline that mailing lists have proved to be the most relevant means of communication in all projects.

Concerning the hierarchy and the members' roles, the overall information indicated that throughout their development, projects had to deal with both formal and informal aspects. With regard to hierarchy, the projects formalized those individuals who were designated to exercise collective management, and adopted, in parallel, the figure of a lateral authority that transcends the established formal setting. With regard to this last aspect, there is convergence with what authors such as Dahlander and O'Mahony (2011) reported about free software projects, when they pointed out that these collectives admit a lateral authority based on the experience and contributions to the project of individuals.

In line with this model of formal and informal hierarchy are the roles played in the projects. In the list of formal roles associated with collective management, the following deserve special mention: in CoGrOO, formal management responsibility was concentrated in professors at several moments in time; in Kytos, follow-up was performed by the *NCC* director and the project coordinator or leader (*Unesp* employee); in Noosfero and OpenNLP, a role that was common to both projects was the release manager (RM). But while the RM in Noosfero released versions of the software and managed the project, in OpenNLP this function focused specifically on the version release process. The formal roles in OpenNLP were those of chair, vice president, and Project Management Committee (PMC) members.

Teams performed formal or informal functions in developing software. Among those in charge of formal roles were project professionals and interns who were hired by the projects (notably by CoGrOO and Kytos). In CoGrOO, hiring took place when the project received funds from *Finep*. In Kytos, hiring has been a reality since the project was first sponsored by Huawei, whose sponsorship remains to this day. Informal roles focused on volunteer developers who engaged in collaborative project activities. Also with respect to the development team, a common role in all collectives is the committer, who is a volunteer or employed developer, who has code writing power in the main project repository. In Noosfero and OpenNLP, committers appear in formally constituted groups. In Kytos, although the roles are pre-defined, becoming a committer has to do with the perception of the coordinator, who invites someone to perform the role when they consider that the individual deserves it. In CoGrOO, this role is informal.

In general, formal and informal roles coexisted throughout the development of the software in the analyzed projects. While research into free software communities shows that volunteers collaborate significantly in community projects (Seidel & Stewart, 2011; Shah, 2006), the projects that were identified here showed that this is not always the case. Particularly in specific projects, like Kytos and CoGrOO, hiring professionals was the solution for keeping the project running at certain times. Hiring and formalizing certain roles has shown that, while the literature states that roles are poorly defined in free software communities (Arazy et al., 2016; Eseryel et al., 2020; Lee & Cole, 2003), this is not always the reality in the projects studied.

Similarities with research into free software were also verified. For example, regardless of whether roles are formal or not, in all projects respondents reported that, as required, individuals could perform functions other than those formally assigned to them. This coincides with what Lee and Cole (2003) and Arazy et al. (2016) advocated, when they reported that individuals can perform multiple overlapping roles in community spaces. Another common issue in all projects relates to the role of leadership, which has been paramount in governance for promoting unity and the alignment of behaviors and objectives (Guimarães et al., 2013; Mäenpää et al., 2017; Seidel & Stewart, 2011). In Kytos, the coordinator is primarily responsible for leadership, while in CoGrOO the professors and the

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main software developer exercised this role after removing the other members. In Noosfero, the RM assumed the project management and leadership roles. Although the chair was a type of leader in OpenNLP, in fact this person stood out because they were more heavily involved in bureaucratic activities, which led to other members of the group who had a leadership profile assuming this role.

In relation to decision-making, although all projects were open to participants expressing their opinions, centralization was visible in the absence of consensus, or when the decisions involved strategic questions about the direction of the project. This perception converges with the paradox of free software studies, according to which, although such projects are decentralized, relevant decisions are often centralized (Lee & Cole, 2003; Seidel & Stewart, 2011; West & O'Mahony, 2005). In CoGrOO, centralization happened because of the professors who oversaw the project at specific times, and the responsibility of the main project developer, who in several phases of the project was responsible for this function. In OpenNLP, a formalized consensus process, known as a consensus meeting, was notorious. Project members vote on a particular issue by way of email lists, and the solution resulting from the final vote count is the one that prevails. Despite this search for consensus, the representatives with voting power on the most relevant issues are those in the PMC. If there is a decision impasse in Noosfero, the individual formally assigned to take the final decision is the RM. In its decision-making structure Kytos stated that the most strategic choices are made by the director of the *NCC* and the project coordinator, although members are free to express their opinions.

Noosfero and OpenNLP have proved to be the projects with the most formal regulations on how decisions should be made. In the other projects, decisions are made according to the occasion, and without any previously defined protocol. Centralization of the most impactful decisions on the project, however, has been mostly entrusted to one or more individuals in the collective, either because of a formally delineated role, or because of the influence of more experienced collaborators in the project.

Control

Formal processes for controlling members' behavior and collective results were observed in some activity flows in the projects investigated. In this regard, the following processes stand out: choosing representatives and defining responsibilities for exercising a certain role; decision-making, in particular strategic decisions that set the objectives of the project; regulations of the contributions received, especially those regarding changes in the source code of the software; the routines required for releasing versions of the software; and reporting for accountability or project monitoring.

The analyzed projects that stood out because they had well-defined and formally delimited processes were OpenNLP, Kytos, and Noosfero. OpenNLP, as with other Apache projects, was characterized by following a number of procedures that were detailed on the foundation's website. Apache also has a code of conduct to guide participants and requires individuals who become committers to sign a document confirming that they follow the project license terms. Kytos is similar to the OpenNLP project, with individuals willing to collaborate needing to be aware that they will be governed by the software license terms set out on the project's webpage. Kytos also stood out with regard to formalizing certain roles in addition to those of the *NCC* director and the coordinator, such as hiring professionals with funds provided by the Huawei sponsorship agreement. Both Kytos and OpenNLP adhere to the rule whereby project tracking reports have to be delivered to the sponsoring company and the Apache foundation, respectively.

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Having experienced a phase of conflict, in which the volunteers at one point demanded greater openness for the project and independence from *Colivre*, Noosfero drafted a document that contained a series of formalizations. The idea behind this document was that the requested openness should maintain the quality of the software. The document, which was made available virtually, provided guidance on the exercise of roles and the ways in which contributions involving the software should occur.

While CoGrOO had no well-defined processes, which only occurred when there was an interface with OpenNLP, it experienced times when formalized actions were needed. These periods occurred especially when the development of the grammar checker software received funding from *Finep*, and when the software was used in courses and research that was being conducted within the scope of USP. At such stages, the various existing task forces had limited commitments and delivery schedules that were supervised by professors.

When projects are considered during their development phase, the formalization of behaviors and results is evident in various situations. Thus, while research into free software indicates that these initiatives stand out because of their informality and poor process structures (Eseryel et al., 2020; Kolbjørnsrud, 2016; Lattemann & Stieglitz, 2005; Lindberg et al., 2016; Xu et al., 2005), these projects showed that, depending on the moment, formal processes were also adopted by the collectives. This happened mainly at times when projects established relationships with other formal organizations (Mäenpää et al., 2017; Viseur & Charleux, 2019; West & O'Mahony, 2005). Thus, projects such as CoGrOO, in its interface with OpenNLP, Noosfero, and Kytos, had more formalized processes in place. These are collectives that are part of foundations or receive sponsorship, which requires the expected conduct and deliveries of members to be clearly defined.

Social aspects were reported by the interviewees as informal control procedures. In promoting the socialization of project members, the use of ICT resources enabled a common virtual space to be created for collaborative work (Eseryel et al., 2020; Seidel & Stewart, 2011). This communication allows heterogeneous members to direct their efforts towards the results. Although most communication takes place virtually, face-to-face meetings to discuss project issues were also reported. Noosfero held face-to-face meetings, with most members living in the same city, especially in the beginning when the project was centered on *Colivre*. CoGrOO's developers studying at USP indicated that they had several moments of face-to-face interaction when the software was being developed in the university. Since Kytos uses *Unesp's* infrastructure, this enables some of its members to meet in person, which often involves those who were formally hired for the project. Opportunities for face-to-face meetings in OpenNLP are rare, and take place mainly at the ApacheCon event, which is an annual conference sponsored by the foundation.

Participants also stressed situations in which they had the opportunity to interact with actors outside the projects. Among these situations, members' participation in technical or academic events in the free software area, or in some project activity were mentioned. Noosfero participants had the opportunity to give talks at meetings on free software. Kytos, CoGrOO and OpenNLP all emphasized events to present technical or academic papers on the projects, and Kytos, in particular, even promoted editions of its Kytos Summit, with talks for participants or individuals interested in the project.

Another perceived form of social control is associated with recognition of the work performed on projects, a practice that is associated with meritocracy. In this respect, experienced members who made relevant contributions and were recognized by their peers distinguished themselves by exerting significant influence on decisions, as highlighted by Lattemann and Stieglitz (2005) and O'Mahony and Ferraro (2007). Respondents also reported external opportunities for recognition. Situations such as reports, interviews, awards, and even moments when

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significant resources could be captured were mentioned as being crucial, especially with regard to the project and its main representatives being recognized. This view of recognition as a form of social control converges with what is expected in community settings, as it is a form of motivation that differs by not using formal rewards or private benefits (Shaikh & Vaast, 2016).

These experiences, by way of internal or external interactions, were essential when it came to individuals creating a sense of belonging with the projects (Lattemann & Stieglitz, 2005; Xu et al., 2005), and even involved those who were remote or less active at the time. Having this reference and identity influences self-control, especially among participants who have made, or who still make contributions as volunteers. By allowing autonomy and independence in the execution of work, technological resources also provide support for self-control, thereby reducing coordination efforts in the collective (Crowston et al., 2012).

With regard to reviewing contributions made to the software, although the projects have rules requiring external collaboration to be reviewed by committers, when these contributions come from committers themselves, the analysis takes place informally by way of a peer control process. In these cases, while committers have writing power in the repository, a common practice has been to have the code reviewed by another committer in the community, especially a more experienced developer. Noosfero is the only project that has tried to create explicit rules in this regard, yet with some flexibility. If after one week the code has not been reviewed by any peer in the collective, the committer that proposed the code has the autonomy to add it to the repository. The projects investigated converged with free software research in the sense that criticism of others' work and the exchange of experiences that is made possible by reviews help ensure the quality of the software that is produced (Kolbjørnsrud, 2016; Lee & Cole, 2003).

Analysis based on the conceptual and theoretical organizational contribution

Besides the projects studied having in common the fact that they work in the context of a provider of physical and technological infrastructure, throughout their history they also had relationships with different organizations. Understanding that stakeholders are groups or people that affect or may be affected by an organization (Freeman, 2010; Frooman, 1999), those actors with whom projects have established relationships are stakeholders. The CoGrOO's main stakeholders are USP, *Finep*, Google and the Apache Foundation's OpenNLP project. In addition to *Colivre*, Noosfero had several stakeholders, such as USP, *Serpro*, UnB, the Federal Government, among others. Kytos's stakeholder were *Unesp*, Huawei, partner institutions and other communities.

This understanding, that the agents with whom projects interact constitute stakeholders, shows that that there is a mutual influence between these projects and their interest groups (Frooman, 1999). This logic of reciprocal influence was seen in Noosfero, when parallel organizations emerged that started executing projects using the software to develop websites in line with their interests. The individuals who participated in these projects and were sympathetic to the free software movement voluntarily returned the code they developed to the Noosfero community. Another example is the fact that *Colivre*, the main sponsor and executor of commercial contracts using Noosfero, invests in maintaining the project community. Stakeholders were also influential when *Colivre* had to manage conflicts with external actors, who demanded greater openness from the project community.

Since the interaction between the projects and the stakeholders is a reality in the analyzed collectives, context plays a crucial role in altering project behaviors (Pfeffer & Salancik, 2003). In this scenario, the resource dependency theory (RDT) can be applied to community-based free software projects. The dynamics perceived

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during the development of the investigated projects revealed that the main driving force of the relationships with stakeholders is the need to obtain resources for business survival. Resources had to be sought to ensure that projects continued to function over the years, either via the infrastructure provided by an institution, or by support from a foundation, sponsor, and/or funding agency. An example of this is Kytos, which in addition to the support offered by *Unesp's NCC* via contacts made by the director of the *NCC*, obtained sponsorship from Huawei, which also made it possible for it to obtain the financial and technological resources needed for developing the software.

Considering the RDT, it is clear that projects are not only influenced by the environment, but also have a proactive stance towards it (Hillman et al., 2009). Project leaders have the autonomy to use various management tactics to provide the means they need to survive in the environment (Sharif & Yeoh, 2014). CoGrOO's constant search for resources took place at various times. In addition to USP's support and the funding provided by *Finep*, the organization had to look for ways to secure more funds during its trajectory, which included receiving funds from the Google *Summer of Code* program. Later, when one of its developers eventually became solely responsible for the project's operations, he found OpenNLP to be a way for the CoGrOO code to continue receiving the necessary maintenance. Since OpenNLP became part of Apache, the project has also had the indirect support of this foundation.

Another admissible association with community-based free software initiatives refers to their similarity to the concept of temporary organizations (TOs). As the definition of TOs expresses it (Burke & Morley, 2016), the projects were characterized as interdependent actors who directed their actions towards accomplishing complex tasks. The release of software versions is the termination point, which occurs as a result of the enterprise setting a specific date, or reaching a previously defined state or condition (Bakker, 2011; Bakker et al., 2009). Another way of perceiving free software initiatives like TOs is through the association of projects with different stakeholders. In these associations, structural adjustments and control processes took place in the projects, marking the outlines of a temporary organizational arrangement that changed as new relationships with stakeholders emerged. Another characteristic that makes the investigated projects more like TOs is the fact that leadership has proved to be a function of fundamental relevance in directing collaborative work (Bakker, 2011).

CONCLUSIONS

The difficulty of separating communities from the formal initiatives developed within the scope of the projects investigated was evident in this study. Governance research must consider the entire context in which community projects take place and the relationships established by these projects. Governance (the structure and control processes) proved to be a flexible and changing concept, which adapted to the development paths taken by these projects. Throughout these changes, formal and informal governance procedures took place.

Although community traits persisted during the development of these projects, management was formalized, mainly due to relationships established between organizational actors. An analysis of these projects indicates that free software ventures need to establish contacts with stakeholders in order to obtain the financial, material, and human resources necessary for their survival. Leadership has proved to be crucial in finding these resources in the environment and for guiding these businesses.

Even though the literature specifies the developmental phases that free software projects pass through and valid features that differentiate them from traditional organizations, in practice these situations did not occur in a

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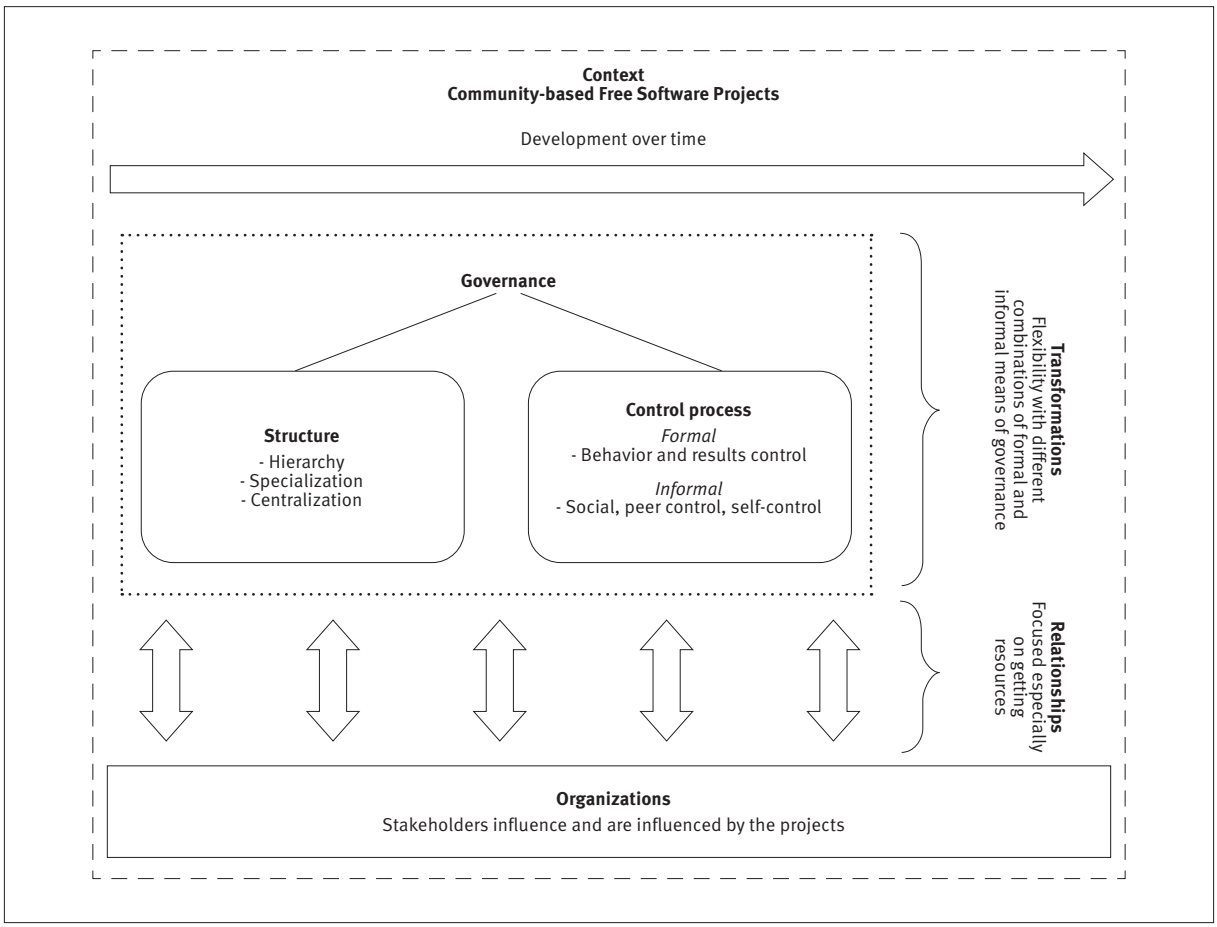
well-defined manner. Although the informal characteristics of the community were retained, the transformations that led to the development of these projects were associated with relationships for obtaining resources that were developed with other organizations. Formal governance in these relationships was necessary at times, and coexisted with the informality of community spaces. Instead of the development phases occurring in a continuous growth perspective, the projects experienced moments of greater and lesser activity that were governed by the resources they were able to obtain from formal organizations. These projects did not fit entirely within either of the concepts in the bazaar vs. cathedral discussion. They shared similarities with traditional organizations, while maintaining community characteristics. Thus, they proved to be intricate mixtures of both types of organization.

Figure 1. Core research idea



This paper's limitations include the choice of units of analysis based on the availability of projects and the fact that the results reflect the investigated context of free software communities. In future research, it is recommended that quantitative or mixed methodological approaches be used, as well as investigations of other types of community organization. In terms of its contributions, this study provides researchers and professionals with a more realistic understanding of the governance of community businesses and the tactics that leaders use to obtain the resources they need to ensure their projects survive.

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AUTHORS' CONTRIBUTIONS

The authors declare that they participated in all stages of the paper's development. Isabela Neves Ferraz helped prepare the research and in data analysis. Carlos Denner dos Santos participated in guiding the entire process involved in searching and revising the text, and making the necessary adjustments.

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BOOK REVIEW

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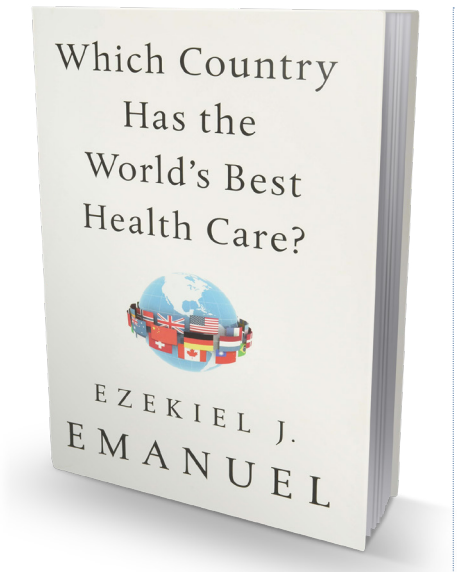
THE WORLD'S BEST IN HEALTH CARE: LEARNING FROM GOOD PRACTICES

WHICH COUNTRY HAS THE WORLD'S BEST HEALTH CARE?

Ezekiel J. Emanuel. New York, USA: Public Affairs, 2020. 466 p.



By

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Ranking can be a good start for any comparative analysis. We live in a society in which measurement, quantification and ranking have become commonplace, from pure curiosity (the 10 best roller coasters) to the creation of instruments that facilitate decision-making (the best MBAs). When a self-described compulsive ranker is an expert in public health policy, the result can be encouraging, not because of the ranking, but because of the proposed comparative analysis model of health care systems in different countries. Health care management researchers are aware of the importance of this analysis for the development of the area, but they understand the challenges in carrying it out due to the complexity of these systems and the non-standard data that are being used for comparison purposes. Professor Emmanuel´s work presents parameters for comparing 11 countries, and highlights the challenges and good practices in health care management around the world.

Ezekiel J. Emanuel is a professor and co-director of the Healthcare Transformation Institute at the University of Pennsylvania. In addition to his academic work, he was an advisor to the Director-General of the WHO and the Director of the Department of Bioethics at the US National Institute of Health. He has written and edited 14 books and over 300 scholarly articles, and he has also been the author of numerous newspaper articles.

Despite his passion for ranking, he finds it inappropriate to rank health care systems as their structure depends on the emphasis that each country places on the dimensions comprise them. If ranking is not appropriate, comparative analysis provides four valuable lessons: (1) no health care system is perfect, since the challenges that health care engenders for all countries result in difficulties that have to be solved; (2) lessons can be learned from the common problems that are faced, even by countries whose systems are considered excellent; (3) it is not possible to define which health care system is the best, but it may be possible to distinguish the good ones from those that are not minimally acceptable; (4) the dimensions of health care systems' analysis become clearer, as do the experiences of other countries in each dimension, which can throw light on future paths for the public policies that are required for improving them.

The comparative analysis involves 11 countries: Australia, Canada, China, France, Germany, Netherlands, Norway, Switzerland, Taiwan, the United Kingdom and the USA,

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which were intentionally chosen because of their differences, some of them having public funding, while others are privately funded, with insurance either being compulsory, or not. These are also the countries that appear most frequently in international debates about the topic, and all of them, for one reason or another, could be acknowledged as a model to follow.

Eight topics were evaluated for each country: (1) history; (2) coverage; (3) financing; (4) payment; (5) the delivery of health care; (6) prescription drug regulations; (7) human resources and (8) future challenges. History is key to understanding health care systems, because one of the arguments is that path-dependence makes it difficult to implement solutions that may have worked well in other countries. Two points are worth noticing: (1) the existence of universal health care systems is recent; (2) after universalization was implemented, there has been no case of reversion. Brazil is a similar case, with recent universalization and no reversal of the process so far. As Machado, Baptista and Lima (2012) highlighted, health care became universal in the country with the 1988 Constitution, in which health was recognized as a right, whose universalization was guaranteed by the creation of the Unified Health Care System (*Sistema Único de Saúde* - SUS). Subsequent decades have been characterized by battles for its effective implementation.

Seven of the challenges shared by these countries are also discussed: cost pressure; the high price of prescription drugs; reducing inefficiency and unnecessary treatment; the coordination of patient care; incompatible care institution characteristics that focus on treating traumas and infections, and the need for continuous care for patients suffering from chronic illnesses; mental health care; and, finally, long-term care for the elderly and how to pay for it. These challenges follow a worsening tendency due to the increase in the average age of populations and the development of more expensive treatment technologies. All these challenges affect Brazil (Saldiva, 2018), and the country is a benchmark in some of them, such as its Family Health Strategy (*Estratégia Saúde da Família*) program, which is internationally recognized for its coordination of patient treatment and long-term care (Machado, Melo, & Paula, 2019).

Finally, the author relates the pandemic to health care systems, arguing that they cannot be merged, as the response to the pandemic requires more than a functioning health care system: "The adequacy of the response depends upon political judgment and leadership to rapidly institute public health measures and the competence of the public health infrastructure to implement them effectively and swiftly". Without the political will to implement the necessary measures, there is no possibility of a positive response from the system, a lesson that the Brazilian government seemingly has not learned during this pandemic.

A point that requires reflection is the lack of emphasis on political dispute in the construction of these systems. Despite his PhD in Political Philosophy and historical contextualization that shows the disputes between interest groups, the author stresses path dependence in its economic sense, mitigating political challenges. In the case of Brazil political disputes involve health care actions aimed at the community and public health, and others of a private nature (Machado *et al.*, 2012), culminating in a shared system between universalization of the public system and the supplementary private health care sector. Of those countries with universal health care, Brazil is the only one in which more is spent on health care in the private system than in the public one, even though the latter serves a greater proportion of the population (Silveira, Noronha, Funcia, Ramos, Moraes, Castro & Noronha, 2020).

Another criticism is that, in spite of defending the universalization of health care, the author accepts that all the dimensions he analyzed are of equal value, and the one that should receive most attention is a matter of choice. The universalization of health care in Brazil resulted from the political struggle of the Health Movement for the democratization of health (Cruz, 2017), which did not end with the universalization that is embedded in the Constitution. The disputes continue with the deregulation of complementary health care (Machado *et al.*, 2012) and proposals for the creation of "affordable" health insurance for those on a low income (Saldiva, 2018).

The book presents an excellent comparative analysis model and is written in accessible language. Contributions to the area of Public Health Care Administration range from the systematization of the diagnostic model to the description of the good practices adopted to improve the efficiency of the systems. Good public and private management practices are also presented, especially innovations in cost management and the creation of incentives for the more efficient management of resources. It is written for academics, professors, and researchers working in the health, economics and management areas, who are looking for a synthetic comparative analysis for use when discussing the problems faced in Brazil. For Ezekiel, the appropriate way of facing up to the challenges that access to quality health care presents is in the ability to optimize the management of the resources invested, without losing sight of the ultimate goal, which is people's well-being.

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BOOK REVIEW

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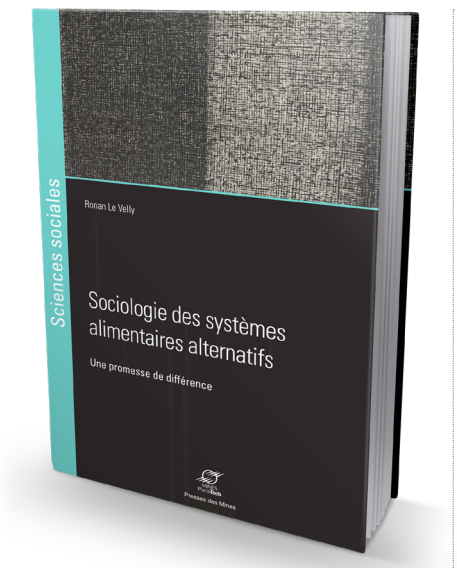
ALTERNATIVE AGRI-FOOD ORGANIZATIONS

Sociologie des systèmes alimentaires alternatifs. Une promesse de différence

Ronan Le Velly. Paris, France: Presses des Mines, Collection Sciences Sociales, 2017. 200 p.



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This book formed part of the postdoctoral studies I carried out in 2019 to 2020 under the supervision of Prof. Dr. John Wilkinson, in the Graduate Program in Social Sciences in Development, Agriculture, and Society at the Universidade Federal Rural do Rio de Janeiro, with the aim of discussing the practices of organizations that operate in the agri-food system, specifically in so-called alternative markets. The main issue of the book is addressed throughout this review, through an interdisciplinary dialogue with the field of Organizational Studies. Production and new ways of feeding have been subject to sharp criticism because of the disastrous results of contemporary food diets that are based on carbohydrates, animal protein, and sugars. The effects are mainly the result of the mass production of goods symbolized by the *4F* Crops model (Food, Feed, Fiber, and Fuel) (Niederle & Wesz, 2018), whose main players are multinational conglomerates that dominate commodity contract negotiations and futures exchange on the Chicago Board of Trade. In this complex and dynamic contemporary scenario, which affects organizations, societies, and individuals, what potential contributions can the Organization Studies field make to this debate in dialogue with other fields of knowledge?

Controversies surrounding food in modern societies, and its different modes of production and consumption have advanced beyond the established debate on agricultural production techniques, the Green Revolution, the effects of the intensive use of new technologies, and chemical inputs in food production.

In a book that was recently published in France on alternative food systems, Ronan Le Velly states that despite the diversity that exists between organizations in agri-food systems, it is possible to distinguish the agri-food system *mainstream* from organizations that share what the author calls a "promise of difference". These organizations adopt their own particular ways of production that are spread by commercial and consumption practices known as alternatives. In other words, they are linked to an alternative "design" notion, with characteristics that are unique to them, resulting in the promise of other organizational forms of agri-food systems, which generate benefits for individuals, societies, and the planet.

Empirical research into food, consumption, agri-food systems, and their markets has been receiving outstanding interdisciplinary contributions, in which the field of Organization Studies has participated in an incipient but promising way. Highlighting, in Brazil, Vol. 58, no. 3, May-June 2018, of the *RAE*, a special issue dedicated to addressing the subject. Specifically in relation to this field's dialogue with economic sociology, the sociology of organizations, and pragmatism. Brazilian and international

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researchers in Organization Studies are investigating various phenomena, with an emphasis on research into innovation processes (organizational and marketing innovation), organizational change processes, or even the structuring of collective action, which occurs within organizations or emerges from markets.

How to explain, for example, that consumers agree to pay more for organic products or engage in voluntary work, when driven by the values and principles that these organizations encourage? Take, for example, the emblematic cases of the international *Slow Food* movement or the global fair-trade organization, *Fair Trade International*. What makes their members mobilize and engage in collective actions in defense of food, for example, that is "good, clean, and fair" (Slow Food, 2007)? How are the forms of regulating actions between actors who are so heterogeneous, who mobilize for a common goal, constituted? What is the point of talking about alternative agri-food systems or organizations when the boundaries of conventional, alternative systems are so vague? Is the alternative in these cases an attribute of social distinction for generating economic value for business organizations, or should it be understood from other points of view and with other characteristics?

The author identifies two main axes that structure these organizations' actions: Control regulation activities and autonomous regulation activities. These regulatory activities are those that ultimately characterize and differentiate them, as does the design notion that encourages the actions of their actors.

Beginning with the sociology of organized action (Reynaud, 1988, 1997, 2003) in a dialogue with the classical tradition of Organizational Theory, control regulation activities, which are typical of bureaucratic organizations (Crozier, 1963), are carried out by hierarchically superior groups in the organizational structure, which are responsible for activities that regulate and control work, or that establish standards and processes that regulate the organization's activities, such as purchasing goods processes, work delegation activities, and the detailed written rules that go to make up commercially recognized quality standards, etc. Autonomous regulatory activities, on the other hand, refer to the activities carried out by actors that are controlled and prescribed, and that seek to replace dominant practices with new organizational arrangements.

The plurality of regulatory sources makes the determination of the *locus* of control or the autonomy of collective actions diffuse, since they are not restricted to the organization's domains, its organizational structure, or even to a single dominant group or actor; they spread by way of social and economic relationship networks inside or outside the organization. In this sense, regulatory activities focus on issues of cooperation and coordination between actors.

Regulatory activities help structure collective action, which is made up of hybrid collectives: actors, relationships, actions, rules, artifacts, routines, discourses, etc. These activities are provisionally stabilized by the organizations' social relations, their agreements and decisions, and by current and accepted organizational practices. The link between actors and collective action that comes from regulatory activities results in the formation of organizational collectives, such as a company, cooperative, or social movement.

These notions are present in the actor-network theory of Akrich, Callon, and Latour (1988), in the sociology of market agencements by Michel Callon (1998, 2013), and in market mediation concepts (Latour, 2006). All these approaches have been increasingly used in Organization Studies in different topics that are not restricted to the agri-food system.

From this point on, Le Velly highlights the fact that that indeterminant spaces of collective action result in zones of uncertainty, enabling new spaces to open up for negotiating established rules. These spaces represent the actors' margins of maneuver (Crozier, 1963; Crozier & Friedberg, 1977), as "norms are always incomplete and ambiguous, being subject to interpretation" (Velly, 2017, p. 29). The strategic capacity of actors for "discovering and experimenting new resources and ways of playing the game" (Friedberg, 1993, p. 178) signals, from a market point of view, the opportunity for innovation in the search for greater control and increased power over market regulations, whether by introducing new products, new practices, and organizational processes, or by creating new market niches. These strategic innovations, and the implementation of mechanisms such as "brand, packaging, or consumer credit" (Velly, 2017, p. 29) are concrete examples that result from the conflict process between groups, underlying the market's regulatory activities.

The book provides us with pathways for answering some of the questions raised in this review by proposing a very original theoretical framework that directly dialogues with Organizational Theory to empirically guide the French case studies that the author has been investigating since the early 2000s.

Three case studies are presented on local food supply chains, which highlight the alternative generation processes with a focus on the hybridization processes of these systems. The regulatory activities required for supplying organic food are identified. These comprise the restrictions and conditions imposed by the legal framework of purchases, or by the dominant practices of

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companies that mainly operate in long-distance trade. In both situations, spaces and opportunities open up for commercial innovation and reconfiguring the studied phenomenon.

The last two chapters discuss the effects produced by growth on the commercial scale of two outstanding initiatives. The case presented reconstructs the *Fairtrade* conventionalization process initiative, a phenomenon the author calls "fair-trade *mainstreaming*", by way of *Max Havelaar* organizations in France and Holland, and *Fairtrade International*. Le Velly does not restrict himself to understanding them only through the theoretical framework of the economics of convention (Boltanski & Thévenot, 1991), or global value chains (Gereffi & Sturgeon, 2005), but above all by mobilizing recent contributions from the new economic sociology in dialogue with Organizational Theory.

In summary, the book provides Brazilian graduate students and researchers who are interested in the subject of organizational and agri-food systems with important and unprecedented contributions. It also promotes a fruitful dialogue with Organization Studies by bringing this field of knowledge closer to economic sociology.

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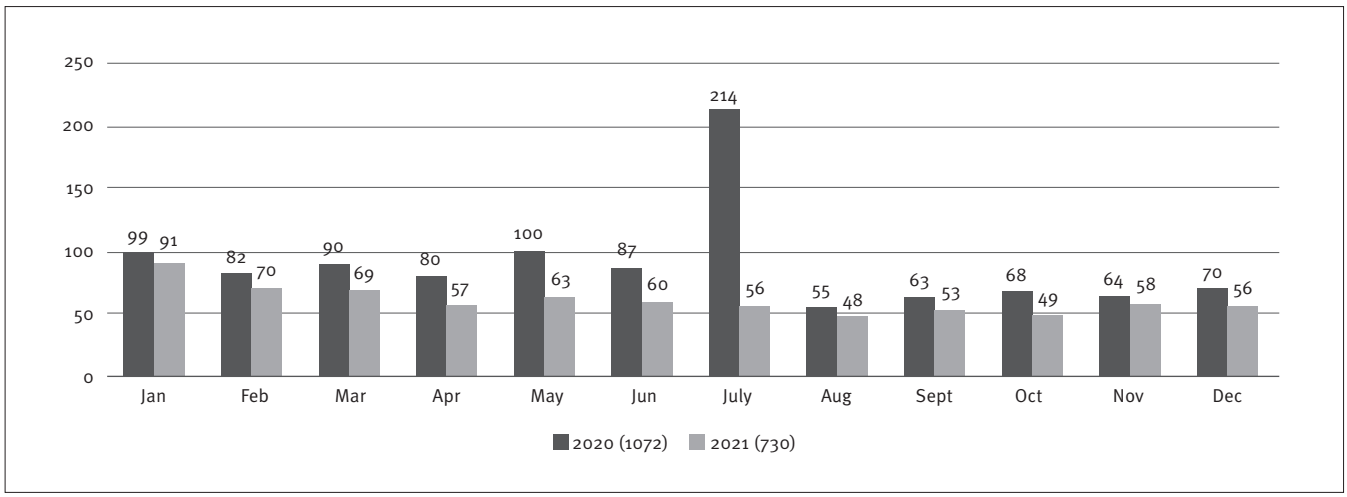
AUTHOR CONTRIBUTIONS

Renê Birochi worked on the conceptualization and theoretical-methodological approach, theoretical review, writing and final revision of the manuscript.

EDITORIAL INFORMATION 2021

Editorial Flow

MONTHLY SUBMISSIONS 2020-2021



ARTICLES PROCESSED IN 2020-2021 (REGARDLESS OF WHEN THEY WERE SUBMITTED)

Status	**2020**	**2021**
Rejeitados (por formato)	381	229
Rejeitados no *desk review* (EIC e AE)	476	359
Immediate Reject	*416*	*254*
Immediate Reject and Ressubmit	*59*	*79*
Reject	1	26
Rejected by peer review (*ad hoc assessors*)	109	105
Reject	*89*	*87*
Reject and Ressubmit	*20*	*18*
Approved	39	47
Articles being processed (updated on 2.08.2022)	80	

ARTICLE PROCESSING TIME (DAYS)

	2020	**2021**
Average rejection time because of submission format	2.8	2.0
Average time for desk review (from submission to desk review by the editor-in-chief).	13.9	30.3
Average time for peer assessment (from submission to conclusion of the final assessment)	105.1	120.0
Average time for processing articles (from submission to final decision)	188.2	211.0
Average time between submission and approval	196	273.0

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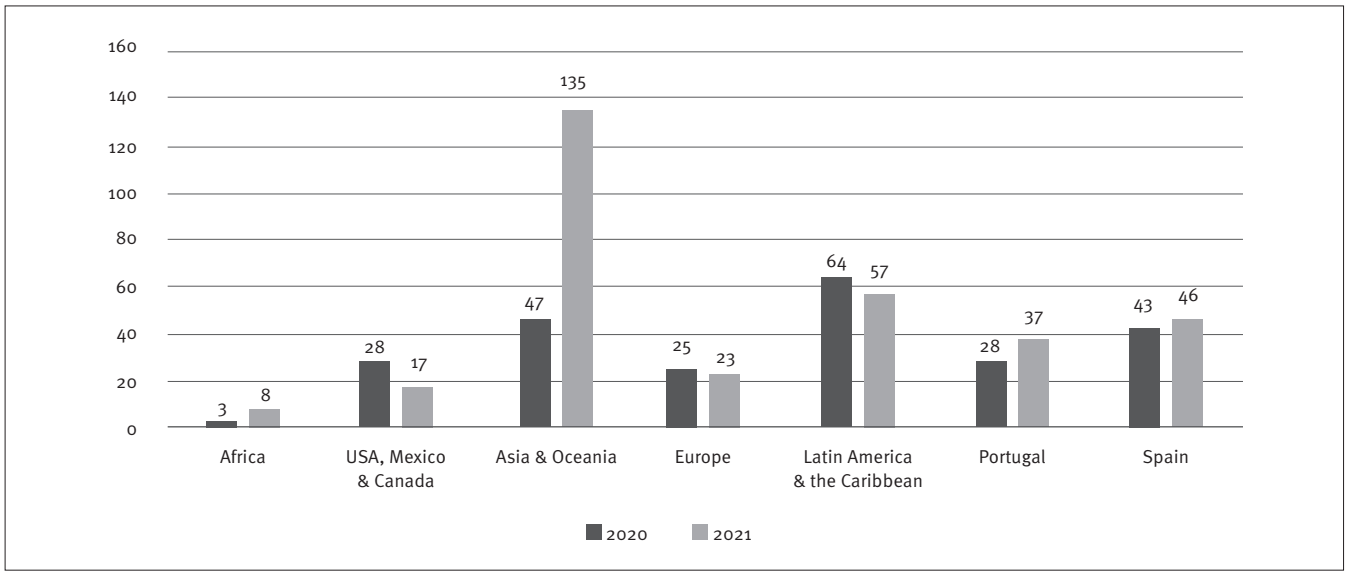
INTERNATIONAL SUBMISSIONS (2020-2021)

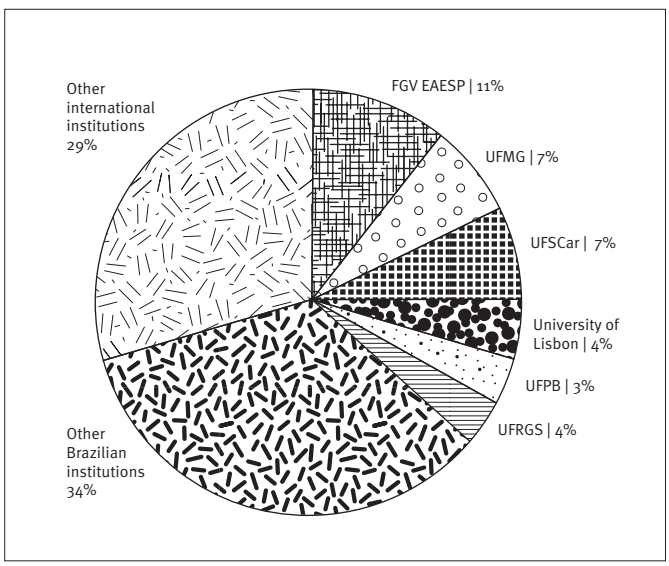


Note: 1) Articles sent for desk review after screening for format and similarities; 2) The international connection of the submitting author is considered in compiling the numbers.

ARTICLES PUBLISHED

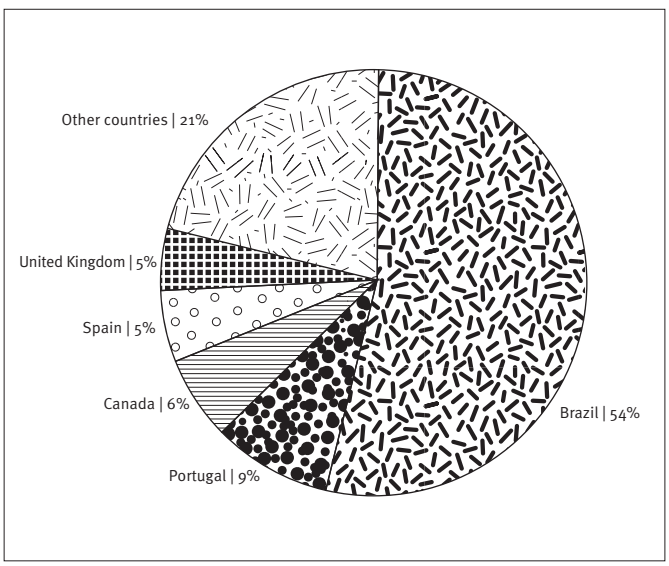
	2020	2021
Total number of articles published	37	40
Submitted for double-blind review	29	27
Guest articles	8	13

Institutional diversity of the authors of the articles (%)



N° = 112 authors

Geographic diversity of the authors of the articles (%)



N° = 112 authors

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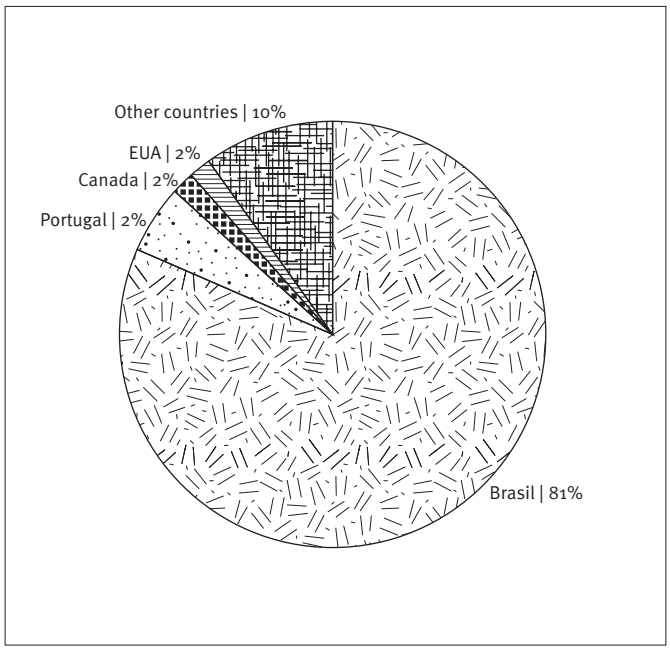
COLLABORATORS

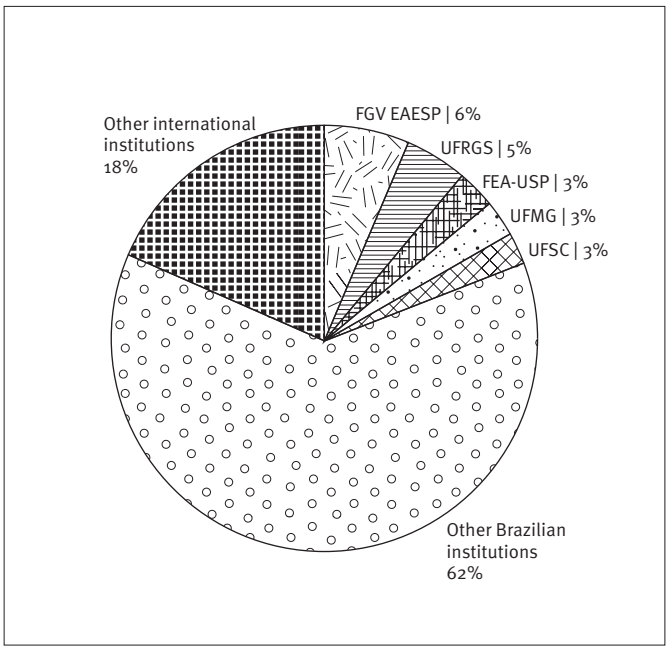
RAE would like to thank all those researchers who used their time, experience, and wisdom to develop the articles they submitted. This voluntary work was fundamental for improving our texts and made an important contribution to Brazilian academia in Administration. Between January and December 2021, 468 collaborators contributed; their names can be found starting on this page. Our special thanks to all of them!

The geographic diversity of the scientific editorial body and *ad hoc* assessors



N°= 468 collaborators

The institutional diversity of the scientific editorial body and *ad hoc* assessors



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