

Associations Between Covid-19 Effects and Companies' Strategic Responses

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Abstract

This article aims to identify associations between the effects of the exogenous shock caused by the Covid-19 pandemic on companies and the strategic responses adopted. Quantitative research was carried out, having been used as data collection technique, a survey with the 431 supplier companies of the Federal University of Goiás - Brazil in 2020. A questionnaire with closed questions was sent by e-mail to all suppliers, made available via link to Google Forms Platform. The interpretation of strategic responses to the shock caused by the pandemic in the light of the behavioral theory of firm allowed to conclude that the concept of organizational slack is useful for understanding the associations found between the effects of the pandemic on companies and the strategic answers. By performing a multiple correspondence analysis, it was possible to verify the formation of three distinct groups involving categories of pandemic effects and strategic responses of companies. The association between the negative effects of the pandemic and strategic response of retrenchment can be interpreted as the search for a solution to a deterioration of the

organizational slack. The association between the positive effects of the pandemic and the strategic response to innovation illustrates the role played by the organizational slack, allowing flexibility in the face of uncertainty.

Keywords: Exogenous shock, Strategic responses, Covid-19, Organizational slack, Brazil.

1. Introduction

On March 11, 2020, the World Health Organization declared Covid-19 a pandemic, which led countries to implement actions to reduce impacts on population health and avoid overloading the capacity of health systems. Covid-19 cost millions of human lives around the world, caused an economic shock and social degradation on an unprecedented scale, and there are uncertainties about how the economic and social recovery from this shock will occur (Atkeson, 2020). Meyer et al. (1990) define exogenous shock as an unexpected and disturbing change in a company's external environment.

It is expected that Covid-19 represents a turning point in the role that companies play in society (Paine, 2020) and it is known that the social impact of economic recovery in an exogenous shock involves the recovery of companies (Ahlstrom, 2010). It is also known that this shock had different effects in different sectors and companies, leading to the possible emergence of new business models (Puranam, 2021). Therefore, if on the one hand, shocks present sudden threats, on the other hand they also present opportunities for companies (Liu et al., 2020).

In their research on strategic responses to crises caused by exogenous shocks, Wenzel et al. (2020) identified four types of strategic responses by companies to these events: retrenchment, persevering, innovation and exit from business. However, the relationship between the effects of exogenous shocks and the companies' strategic responses deserves to be better studied.

This article aims to identify associations between the effects of the exogenous shock caused by the Covid-19 pandemic on companies and the strategic responses adopted. Given the relevant role of public procurement in the development of local economies, due to the large volume of resources involved (Chaves et al., 2019), a quantitative survey was carried out with the supplier companies of products and services of the Federal University of Goiás (UFG) in 2020. It is known that during the pandemic, public universities operated for a long time in a non-face-to-face manner and companies that depended on face-to-face activities to provide their products and services were greatly affected (Backes et al., 2020).

In addition to identifying these associations, this study seeks to understand the reasons for their occurrence in the light of the behavioral theory of firm (Cyert & March, 1963), enabling decision makers to know the role of organizational slack on strategic responses to exogenous shocks such as the one caused by the Covid-19 pandemic.

After this introduction, the theoretical framework for the work and the research methodology are presented, followed by the results, discussion, and conclusions.

1.1 Exogenous shocks and organizational slack

One of the contributions of the behavioral theory of the firm (BTF) (Cyert & March, 1963) is the concept of organizational slack defined by George (2005: 661) as “potentially usable resources for achieving organizational goals”. For Chakrabarti (2015: 1721) organizational slack can be translated in terms of “availability of uncommitted or unabsorbed financial resources that can protect companies from the disruptive effect of an external shock”.

According to BTF, organizational slack availability has the potential to improve companies' performance, facilitating adaptation and innovation that provide competitive advantage,

protecting them from environmental turmoil. In this way, the organizational slack creates value by providing a cushion of resources that allows companies to adapt in response to internal and external pressures (Bourgeois, 1981).

For De Carolis et al. (2009), the existence of organizational slack in a company can reduce the effect of adverse consequences of an exogenous shock, it can allow the company to adapt to a new situation, or it can allow the company to change through innovation, transforming an adverse event in an opportunity.

It is observed that the organizational slack provides flexibility for the company to develop specific resources needed to respond to an adverse event, such as an exogenous shock. In this sense, Wan and Yiu (2006) argue that the organizational slack, represented through the availability of financial resources, can mitigate the effect of capital restrictions that arise during an economic shock, thus increasing the probability of companies being able to take advantage of growth opportunities during a shock, adapting more quickly to environmental changes.

Using arguments from the behavioral theory of the firm, Deb et al. (2017) concluded that organizational slack is beneficial for companies operating in contexts that require adaptation in the face of uncertainties. On the other hand, companies with restrictions of resources will have to strive to optimize the use of their scarce resources. Therefore, a deteriorating organizational slack situation indicates that external obligations are greater than the flow of resources generated internally (Banalieva, 2014), which limits the exploration of new activities that could help generate new income (George, 2005). According to Li (2021), during the COVID-19 pandemic, companies in this situation faced tremendous pressure to clearly focus on the activities necessary to ensure the payment of their obligations, with limited resources to explore emerging opportunities associated with the pandemic.

1.2 Strategic responses to crises caused by exogenous shocks

Research carried out by the Brazilian Institute of Geography and Statistics (IBGE), identified that the main negative impacts of the pandemic on companies were the drop in sales and marketed services, the difficulty in manufacturing products or serving customers, and difficulties in making routine payments. Despite these impacts, approximately 60% of the companies surveyed maintained the number of employees in the period surveyed during the pandemic (IBGE, 2020).

Wenzel et al. (2020), when studying the strategic responses found by companies due to exogenous shocks, concluded that there are four types of strategic responses to these situations: retrenchment, persevering, innovation, and exit.

Several studies have concluded that the strategic response of retrenchment is the most common (Bruton et al., 2003; Do et al., 2021). Through this strategy, companies seek cost and expense reductions, focusing primarily on their core activities (Pearce and Robbins, 1994; Schoenberg et al. (2013). Thus, this strategy contributes to the recovery of companies hit by an exogenous shock, as it seeks to simplify their operations and eliminate bureaucracy (Benner and Zenger, 2016). Some studies present a critical view of the results of adopting this strategy, indicating that it can lead to a drop in the performance of companies that adopt it (Barker III and Duhaime, 1997; Castrogiovanni & Bruton, 2000). However, for Wenzel et al.

(2020), cost containment can be a good strategy, especially in the short term, allowing companies to create the momentum for the necessary changes, through the generation of financial conditions to carry out the necessary actions for a recovery. In addition, this strategic response can contribute to the restoration of efficiency and generation of slack, enabling rapid improvements with the objective of restoring the company's credibility (Castrogiovanni & Bruton, 2000).

Some companies choose to maintain their activities as a response strategy to an exogenous shock. The strategic response of persevering is related to the adoption of measures that aim to ensure the maintenance of a company's activities in response to exogenous shocks (Wenzel et al., 2020). For Chakrabarti (2015), the strategic response of persevering can help companies deal with sudden changes in uncertain circumstances. According to Wenzel et al. (2020), the persevering strategic response can have a positive effect on the survival of companies, as opposed to attempts to promote strategy renewals in conditions of insufficient resources, potentially being an effective strategy in the long-term.

The strategic response of innovation can be defined as the adaptation of companies to changing environments, featuring an ability to explore existing skills and develop new skills (Schmitt et al, 2016). This strategy can offer a great response to prolonged crises in which companies need to seek other sources of revenue (Wenzel et al., 2020). For the authors, the strategic response of innovation can be decisive for the survival of the business in the long term. Opportunities to innovate may involve investments in research and development, launches of new products and services, and acquisitions of assets. In their study of the Asian economic crisis that occurred between 1997 and 1998, Wan and Yiu (2009) highlighted the importance of the existence of idle resources for innovation and business expansion initiatives.

Finally, the strategic response of exit is related to the disinvestment and discontinuation of the business, albeit temporarily (Wenzel et al., 2020). One of the benefits of this strategy is that it contributes to the release of resources that can be used in a renovation process (Ren et al., 2019). Thus, the exit strategic response does not always represent business failure, nor would it be the final response to other response strategies that failed (Dai et al., 2017). Therefore, if on the one hand the exit strategy response can be seen as a mere solution to a problem, used in times of crisis and decline, on the other hand, it can also be seen as a proactive measure (Feldman, 2021).

For Ren et al. (2019), the exit of large players, especially in markets dominated by few companies, sometimes causes drastic changes in the environment and has implications for the strategies of surviving companies, whether by opening new opportunities or by breaking the market balance, causing uncertainty. According to Hoetker & Agarval (2007), a competitor's exit strategy offers opportunities for the remaining companies to appropriate both the product space and the geographic space of the rival that is leaving.

2. Methodology

For the fulfillment of the purpose of this work, a quantitative research was carried out, having been used as a data collection the survey technique. The field research had as a source of investigation 431 companies that, in 2020, sold products and/or services to the Federal

University of Goiás (UFG) as suppliers. According to Creswell (2003), carrying out a survey allows the quantification and generalization of populations attitudes by studying their sample. Therefore, it is an appropriate method to study the strategic responses adopted in the face of the exogenous shock caused by the Covid-19 pandemic in companies supplying products and services to UFG.

A questionnaire with closed questions, elaborated by the authors, was used. The content validity of the questionnaire was obtained from the literature review for its preparation, in order to ensure that all concepts relevant to the constructs of interest were included in the questionnaire (Bannigan & Watson, 2009). The link to the questionnaire was sent by e-mail to all 431 suppliers of UFG, and made available via the Google Forms platform. After a pre-test carried out with 10 companies, the survey occurred between September 27 and October 2, 2021. The pre-test did not indicate the need to make adjustments to the structure of the questionnaire, so the questionnaires received in the pre-test were used in the analysis of the results.

According to Polit and Beck (2004), reliability refers to how consistent or reliable a measurement scale measures what it is supposed to measure. The Alpha Cronbach statistic, was used to evaluate the internal consistency of the variables. In this research, Cronbach's Alpha obtained via SPSS was 0.682, which indicates the presence of internal consistency.

The Federal University of Goiás (UFG), created by Law n. 3.834, of December 14, 1960, and restructured by Decree n. 63,817, of December 16, 1968, was born from the union of five higher schools that existed in Goiânia (Faculty of Law, Faculty of Pharmacy and Dentistry, School of Engineering, Conservatory of Music and Faculty of Medicine). Its creation allowed the state of Goiás to form its own professional staff and no longer depend on the import of qualified labor from other states. UFG enjoys administrative and financial autonomy, has a network of suppliers made up of companies operating throughout Brazil (UFG, 2021).

In line with the variables identified in the aforementioned IBGE survey on the effects of the pandemic on companies (effects of the pandemic on revenues, routine payments, number of employees), and in line with the theoretical framework on strategic responses to exogenous crises (retrenchment, persevering, innovation, exit), the variables defined in the questionnaire to study the effects of the Covid-19 pandemic on companies and the strategic responses adopted were as follows:

- a) Effect of the pandemic on the company's business in 2020 (V1).
- b) Effect of the pandemic on the company's revenue in 2020 compared to the previous year (V2).
- c) Effects of the pandemic on the company's ability to make payments to suppliers, salaries, and taxes in 2020 compared to the previous year (V3).
- d) Effect of the pandemic on the number of employees in 2020 compared to the previous year (V4); and
- e) The company's strategic response to the effects of the pandemic in 2020 (V5).

For the variable "effects of the pandemic on the company's business in 2020" (V1), three categories were established:

- 1- There was a negative effect of the pandemic on business in 2020 (V1neg).

2- There was a positive effect of the pandemic on business in 2020 (V1pos).

3- There was no effect of the pandemic on the business in 2020 (V1nul).

For the variable "effects of the pandemic on the company's revenue in 2020" (V2), three categories were established:

1- There was a negative effect of the pandemic on the company's revenue in 2020 (V2neg).

2- There was a positive effect of the pandemic on the company's revenue in 2020 (V2pos).

3- There was no effect of the pandemic on the company's revenue in 2020 (V2nul).

For the variable "effects of the pandemic on the company's ability to make payments (suppliers, salaries, taxes) in 2020" (V3), three categories were established:

1- There was a negative effect of the pandemic on the company's ability to make payments in 2020 (V3neg).

2- There was a positive effect of the pandemic on the company's ability to make payments in 2020 (V3pos).

3- There was no effect of the pandemic on the company's ability to make payments in 2020 (V3nul).

For the variable "effects of the pandemic on the number of employees in 2020" (V4), three categories were established:

1- There was a negative effect of the pandemic on the number of employees (decrease) in 2020 (V4neg).

2- There was a positive effect of the pandemic on the number of employees (increase) in 2020 (V4pos).

3- There was no effect of the pandemic on the number of employees in 2020 (V4nul).

For the variable "company's strategic response to the effects of the pandemic" (V5), five categories were established:

1- Strategic response of retrenchment (V5retr).

2- Strategic response of persevering (V5pers).

3- Strategic response of innovation (V5inov).

4- Strategic response of exit (V5exit).

5- Other (V5other)

(1)

3. Results

A total of 65 valid questionnaires were obtained, so that 15.1% of the companies to which the questionnaire was sent comprised the survey sample.

From the survey data, it was possible to observe that 51 responding companies (78.0% of the total sample) have up to 10 employees, 7 companies (11.0%) have 11 to 20 employees, only one company has 21 to 50 employees and 6 companies (9.2% of the sample) have more than 50 employees.

Most companies surveyed have been in the market for 15 years or more (23 companies, or 35.4% of the sample), 16 companies have been in the market for 4 years or less (24.6% of the sample), 13 companies have between 5 and 9 years in the market (20% of the sample), 11 companies have been in the market for between 10 and 14 years (16.9% of the sample) and

two companies did not report how long they have been in the market.

Most responding companies (43 companies, or 66.2% of the sample) reported having suffered a negative effect caused by the pandemic. On the other hand, 15 companies (23.1% of the sample) reported having perceived a positive effect of the pandemic on their business and 7 companies (10.8% of the sample) reported that the pandemic had no effect on their business.

Regarding the effects of the pandemic in 2020 on the revenue of the companies surveyed, most of them (43 companies, or 66.2% of the sample) responded that they had suffered a negative effect, 15 companies (or 23.1% of the sample) responded that the pandemic had a positive effect on their sales and 7 companies (10.8% of the sample) responded that they had no effect on their sales due to the pandemic.

Most of the companies surveyed (37 companies, or 56.9% of the sample) reported having difficulty making payments to suppliers, salaries, and taxes. For 15 companies (23.1% of the sample) there was no significant effect on their ability to make payments and 13 companies (20.0% of the sample) reported that the effect of the pandemic on their ability to make payments was positive.

The study data show that 38 companies (58.5% of the sample) had no change in the number of employees, 19 companies (29.2% of the sample) had a reduction in the number of employees and 8 companies (12.3% of the sample) had an increase in the number of employees.

In convergence with previous studies (Bruton et al. 2003; Do et al. 2021) the survey data indicate that the retrenchment strategy was the most used strategic response by companies. Thus, 40 companies (61.5% of the sample) adopted the strategic response of retrenchment as a strategic response to the crisis, which represents 61.5% of the total respondent companies; 12 companies adopted the strategic response of persevering, which is equivalent to 18.5% of the total responding companies. Another 5 companies adopted the innovation strategic response, which corresponds to 7.7% of the total responding companies. Only 2 companies adopted the exit strategic response, equivalent to 3.1% of the total, and 6 companies (9.2% of the total respondents) reported that they adopted other strategies as a response to the crisis caused by the pandemic.

To prepare the diagnosis of the existence of a statistically significant association between two-by-two variables, the null and alternative hypotheses were established as follows:

H0: the two variables are randomly associated.

H1: the association between the two categorical variables is not random.

Chi-square statistics were calculated for each pair of variables. As shown in Table 1, all calculated P-values obtained by Chi-square statistics were less than 0.05. Therefore, it was possible to reject the null hypothesis that variables are randomly associated. That is, there is a statistically significant association, at the level of 5%, between all the variables analyzed, two by two.

Table 1. Qui-Square Tests

Variable	V2	V3	V4	V5
V1	0.000	0.000	0.001	0.002
V2		0.000	0.010	0.011
V3			0.048	0.000
V4				0.001

Source(s): research data

Dependence relationships between each pair of categories involving the five studied variables were studied. This was done by calculating the adjusted standardized residuals, as shown in Table 2. Positive values greater than 1.96 are highlighted and characterize the statistically significant associations at the 5% significance level.

Table 2. Adjusted Standardized Residuals

Residuals	V2neg	V2pos	V2nul	V3neg	V3pos	V3nul	V4neg	V4pos	V4nul	V5retr	V5inov	V5pers	V5exit	V5Rother
V1neg	5.8**	-5.6	-1.4	4.5**	-3.7	-1.8	3.7**	-2.6	-1.7	3.0**	-2.3	-2.7	1.0	0.0
V1pos	-5.6	6.7**	-0.6	-3.9	4.4**	0.4	-2.8	3.7**	0.1	-3.2	3.1**	1.8	-0.8	0.6
V1nul	-1.4	-0.6	2.9**	-1.6	-0.4	2.3**	-1.8	-1.0	2.4**	-0.3	-0.8	1.8	-0.5	-0.9
V2neg				5.6**	-4.3	-2.4	3.1**	-1.8	-1.7	3.0**	-3.3	-1.3	1.0	0.9
V2pos				-3.9	5.2**	-0.3	-2.8	2.8**	-0.7	-2.0	3.1**	0.9	-0.8	-0.4
V2nul				-3.2	-0.4	4.2**	-0.9	-1.0	1.5	-1.9	0.7	0.7	-0.5	1.9
V3neg							2.3**	-1.2	-1.3	4.8**	-2.7	-3.1	-0.2	-1.2
V3pos							-0.5	2.3**	-1.0	-3.2	3.5**	-0.3	1.1	1.9
V3nul							-2.2	-0.8	2.5**	-2.6	-0.2	4.0**	-0.8	-0.4
V4neg										1.3	-1.5	-2.5	0.7	2.1**
V4pos										-3.0	3.4**	1.5	-0.5	0.3
V4nul										0.8	-0.9	1.3	-0.2	-2.2

** above 1.96

Source(s): research data

The analysis of Table 2 shows that several categories related to negative effects of the pandemic on business are statistically significantly associated with each other at the 5% level and with the strategic response of retrenchment. Also, several categories relating to the positive effects of the pandemic on business are statistically significantly associated with each other at the 5% level and with the strategic response of innovation. Finally, several categories relating to the null effects of the pandemic on business are statistically significantly associated with each other at the 5% level and in this group, only one category is associated with a strategic response, that of persevering.

No category showed a statistically significant association with the exit strategic response and only one category showed a statistically significant association with other strategic responses (V4neg/V5others).

These findings indicate that the shock caused by the pandemic had different effects in different companies (Puranam, 2021). In addition, it was possible to observe the existence of different strategic responses (Wenzel et al., 2020) and that the strategic responses found by companies are associated with the effects of the pandemic on them. Finally, the results point to the formation of three different groups involving categories of pandemic effects on companies and the strategic responses found, which can be effectively verified by performing

a multiple correspondence analysis.

In the specific case of this study, all the Chi-square tests between the variables studied two by two were significant at the 5% level (Table 1). Thus, it was possible to use the variables "effects of the pandemic on the business" (V1), "effects of the pandemic on revenue" (V2), "effects of the pandemic on the ability to make payments (suppliers, salaries, taxes)" (V3), "effects of the pandemic on the number of employees in 2020" (V4) and "strategic company response to the effects of the pandemic" (V5) in a multiple correspondence analysis.

To perform the multiple correspondence analysis between the variables, the SPSS Statistics 26 software was used. The correspondence analysis technique, according to Fávero & Belfiore (2015), is characterized as an exploratory technique, used when the objective is to study associations between variables and their respective categories. For the authors, this technique had its theoretical origin in the work of Hirschfeld (1935), and the work carried out by Greenacre (2017) has been essential for the dissemination of the technique.

Figure 1 illustrates the perceptual map obtained from the multiple correspondence analysis performed.

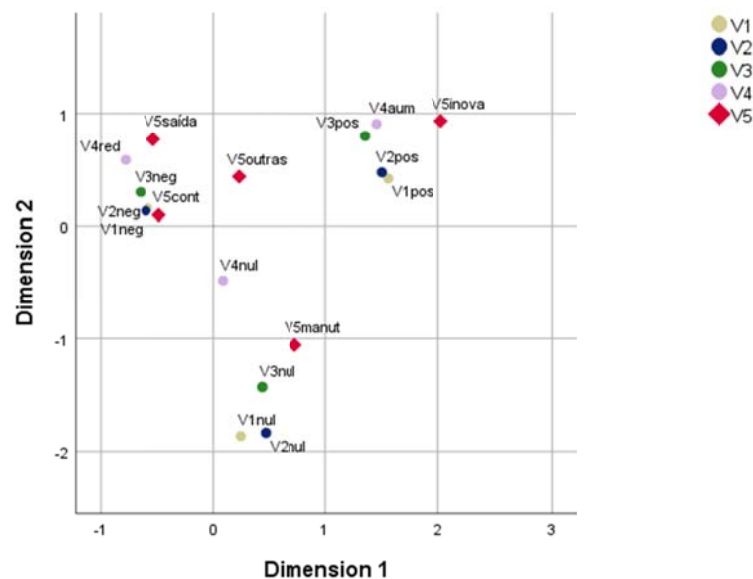


Figure 1. Pandemic Effects Categories and Strategic Responses

Based on the perceptual map illustrated in Figure 1, it is possible to verify the formation of three distinct groups involving categories of pandemic effects on businesses and categories of strategic responses.

The first group is formed by the categories V1pos, V2pos, V3pos, V4pos, V5 inov. In this case, the positive effects of the pandemic experienced by companies in their business must have allowed for the formation of a financial slack (George, 2005; Chakrabarti, 2015).

According to the behavioral theory of the firm (Cyert & March, 1963), the availability of financial slack has the potential to facilitate adaptation and innovation, being beneficial for companies operating in contexts that require adaptation in the face of uncertainties (Deb et al., 2017). In this case, the formation of organizational slack favored innovation initiatives by companies, confirming results obtained in previous research (Wan & Yiu, 2009).

The second group is formed by the categories V1neg, V2neg, V3neg, V4neg and V5cont. It is observed that this group illustrates the association of the retrenchment strategic response with the categories related to the pandemic's negative effects on the business, the pandemic's negative effect on the company's revenue, the pandemic's negative effect on the number of employees and effect negative impact of the pandemic on the ability to make payments to suppliers, wages, and taxes. In this case, the negative effects of the pandemic on companies led to a deterioration of the organizational slack (Babalieva, 2014) and the consequent restriction of resources, forcing companies to seek to optimize the use of their scarce resources (Deb et al., 2017), given the pressures to focus on the activities necessary to guarantee the payment of its obligations (Li, 2021), leading to the strategic response of retrenchment.

A third group is formed by the strategic response of maintaining the level of activities (persevering) as a strategic response to the shock caused by the Covid-19 pandemic. It is observed that this group presents an association of this strategic response with the categories related to null effects of the pandemic on the business, null effects of the pandemic on company revenues, null effect of the pandemic on the number of employees and null effect of the pandemic on the ability to make payments to suppliers, wages, and taxes (V1nul, V2nul, V3nul, V4nul).

4. Discussion

Despite the uncertainties about how the economic and social recovery from the environmental shock caused by the Covid-19 pandemic will occur (Atkeson, 2020), it is known that the social impact of economic recovery in an environmental shock involves the recovery of companies (Ahstrom, 2010). In this sense, the contribution of this study is to associate the known categories of strategic responses of companies to environmental shocks (Wenzel et al., 2020), with categories related to how companies were affected by these shocks.

The interpretation of strategic responses to the shock caused by the pandemic in the light of the behavioral theory of firm (Cyert & March, 1963), allowed us to conclude that the concept of organizational slack is useful for understanding the associations found between the effects of the pandemic on companies and the strategic answers found.

Thus, the association between the negative effects of the pandemic and the strategic response of retrenchment can be interpreted as the search for a solution to a deterioration of the organizational slack, involving the need to optimize resources (Banalieva, 2014), which limits the exploration of new activities that could help generate new income (George, 2005). During the COVID-19 pandemic, companies in this situation faced enormous pressure to focus

clearly on activities necessary to ensure payment of their obligations, with limited resources to explore emerging opportunities associated with the pandemic (Li, 2021).

On the other hand, the association between the positive effects of the pandemic and the strategic response to innovation illustrates the role played by the organizational slack, allowing flexibility in the face of uncertainty in a context in which adaptation is essential for the survival and success of the company. In this case, the existence of organizational slack can reduce the negative effects of an exogenous shock, allowing the company to adapt and change through innovation, transforming an adverse event into an opportunity (De Carolis et al, 2009).

Considering the low number of valid questionnaires obtained, it is desirable that future surveys can expand the number of surveyed companies. Considering that this research did not segregate its sample by activity sectors to which the companies surveyed belong, for future research, studies in which this segregation can be done are suggested, allowing for comparisons between companies from different sectors.

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