

# **THE RELEVANCE OF INTER-ORGANIZATIONAL RELATIONSHIPS AND INNOVATION IN MSMES DURING THE COVID-19 PANDEMIC CRISIS**

## **LA RELEVANCIA DE LAS RELACIONES INTERORGANIZACIONALES Y LA INNOVACIÓN EN LAS MIPYMES DURANTE LA CRISIS DE LA PANDEMIA DEL COVID-19**

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### **Abstract**

This article analyzes the relevance of collaboration and innovation in inter-organizational relationships in small companies (MSMEs), searching for actions that minimize the negative effects of the crisis generated by the Covid-19 pandemic. The task is important because of small companies' social and economic relevance in countries. In addition, reacting to crises has become an increasingly task for managers of small enterprises. We used the results of a survey with 763 MSMEs from 6 Brazilian states, developed by universities participating in the Iberoamerican MSME Observatory in 2021. Data were analyzed with descriptive statistical analysis. Instead of the literature, the results indicate that entrepreneurs do not form and do not increase partnerships in the face of the crisis and do not carry out innovations linked to these relationships. The results contradict the experts who claim that collaboration and collective innovation are the dominant strategic response for MSMEs in crisis situations. Data show that the innovations developed by the companies had a mainly individual and internal character. The article contributes to deepening the understanding of the relevant factors considered by entrepreneurs in crisis situations and indicates the need for reflection on public support policies since companies that received support or collaboration did not have significantly better results than those that did not receive support.

**Keywords:** small companies, collaboration, innovation, crisis, strategy

## Resumen

Este artículo analiza la relevancia de la colaboración y la innovación en las relaciones interorganizacionales en las pequeñas empresas (MIPYMES), buscando acciones que minimicen los efectos negativos de la crisis generada por la pandemia del Covid-19. La tarea es importante por la relevancia social y económica de las pequeñas empresas en los países. Además, reaccionar ante las crisis se ha convertido cada vez más en una tarea para los gerentes de pequeñas empresas. Utilizamos los resultados de una encuesta con 763 MIPYMES de 6 estados brasileños, desarrollada por universidades que participan en el Observatorio Iberoamericano de MIPYMES en 2021. Los datos se analizaron con análisis estadístico descriptivo. En contraposición a la literatura, los resultados indican que los empresarios no forman y no aumentan las alianzas frente a la crisis y no realizan innovaciones vinculadas a estas relaciones. Los resultados contradicen a los expertos que afirman que la colaboración y la innovación colectiva son la respuesta estratégica dominante para las MIPYMES en situaciones de crisis. Los datos muestran que las innovaciones desarrolladas por las empresas tuvieron un carácter principalmente individual e interno. El artículo contribuye a profundizar en la comprensión de los factores relevantes considerados por los empresarios en situaciones de crisis y señala la necesidad de reflexionar sobre las políticas públicas de apoyo ya que las empresas que recibieron apoyo o colaboración no tuvieron resultados significativamente mejores que las que no recibieron apoyo.

**Palabras clave:** pequeñas empresas, colaboración, innovación, crisis, estrategia

## 1. Introduction

This article aims to analyze the relevance of collaboration and innovation by micro, small and medium-sized companies to maintain themselves during the COVID-19 pandemic experienced by Brazil from 2020 to 2021. The guiding hypothesis of this study is that in crisis situations, MSMEs seek to rely on partners and develop forms of collaboration with them, creating innovations and other actions to maintain their activities in the market (Dias et al., 2022). However, studies before the pandemic period state that the answer may be the opposite of this hypothesis; that is, in a crisis, MSMEs tend to isolate themselves and turn inward, seeking their own resources to face adversity (Hoffmann et al., 2017). The analysis of the role of these response strategies of MSMEs is a relevant topic since they are responsible for a significant portion of the countries' economies, especially in Latin America, where they have a social function of employability and wealth distribution (Saavedra & Hernández, 2008).

Among the potential strategies for companies to act in the market, collaboration and forming partnerships, participation in networks, and obtaining resources and advantages that would hardly be obtained by the isolated action of companies stand out (Verschoore & Balestrin, 2008). A network is a set of organizations that work together to solve problems common to all, situations that each one alone would not be able to solve (Giglio, 2015; Wegner, 2019). Considering this condition, or network, managers had to produce goods and services with a low incidence of conflicts and asymmetries. In that case, the results obtained are superior to the results of each one individually.

Considering the legitimation of the field of network studies in the 1990s (Nohria & Eccles, 1992; DiMaggio & Powell, 1983; Castells, 2000), the strategy was recognized and adopted in various business segments involving small, medium, and large companies. In several fields of business, competition started to take place between networks and chains and not between isolated companies. The idea of collective work also expanded to public policies and social actions (Klijn; Koppenjan & Termeer, 1995). From the 1990s onwards, there was a growing movement of creating networks among small and medium-sized companies (Nohria & Eccles, 1992), which enabled them to achieve competitive capabilities that previously belonged only to large companies, such as the scale of production and power of negotiation (Verschoore & Balestrin, 2008).

However, this strengthening of small business networks took place in a relatively stable global market. The crisis caused by the pandemic posed a question, which is the reason for reflection in this article: What is the role of collaboration and innovation for MSMEs to minimize the negative effects of the COVID-19 pandemic? As support for the reflections, data from the survey entitled “Economic Impact of the COVID 19 Pandemic on MSMEs in Brazil in 2021”, carried out by the Iberoamerican Observatory of MSMEs with support from

FAEDPYME, and research by the Brazilian universities include, in the items that refer to innovations and cooperation (Lema et al., 2021).

The results contribute to a deeper understanding of the responses of MSMEs entrepreneurs in situations of extensive crisis, such as the COVID-19 pandemic, focusing on the collaboration and networks of companies and the innovations linked to them. From them, it is possible to discuss the theory of collective actions and innovations and the managerial models of strategic responses of entrepreneurs under crisis conditions.

This article is structured as follows. This initial section presented the context, reasons that motivated the study, research question, and objective of this work. The following section 2 presents the theoretical framework of the article, followed by section 3, the methodological procedures used in this work. Section 4 presents the results achieved in the research concerning the studied topic. In section 5, these results and their implications are discussed. In the final section, 6, the final considerations, the limitations of the study, and the proposals for future research on the topic are presented, followed by the references used in the article.

## 2. Theoretical Foundations

Considering the topic of collective innovations, some authors emphasize the importance of a network of connections between companies, which creates an environment conducive to the transfer of knowledge and exchange of ideas, resulting in innovations (Kofler & Marcher, 2018).

In this context, among the factors that contribute to innovation, like geographical proximity, previous relationships, previous experiences of collaboration, degree of openness of the network of companies to connect with other agents, and flexibility of the existing governance in the network stand out (Kofler & Marcher, 2018; Brink, 2018).

Observing, on the other hand, the biggest challenges faced by MSMEs, especially in periods of crisis, the following can be found (OECD, 2009): (i) drop in demand for products  
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and services; (ii) increase in payment delays and receivables; (iii) increase in raw material and input prices; (iv) liquidity problems; (v) growth in insolvency and bankruptcy of related companies. To survive and remain active in the market under these circumstances, many MSMEs react by cutting costs, reducing assets, planning vacations and work interruptions, delaying the payment of their debts, and/or canceling new investments.

Sometimes, however, MSMEs, due to their flexibility, adaptability, and resilience, are able to perceive new market opportunities, which can be achieved by participating in collaborative networks or alliances, by the complementarity of their characteristics, or by the creation of new markets (Kossyva & Sarri, 2014).

Considering the formation of networks and alliances between companies, the most relevant factor in determining the future intention to participate in networks and collaborative processes to face uncertainties is the previous use of these types of collaboration or cooperation (Marino et al., 2008). In this way, the trend is for more mature companies with previous experience in collaboration to participate more actively in networks of companies to deal with periods of increasing uncertainty.

On the other hand, MSMEs that collaborate in technological terms with suppliers and customers, often young or “high tech” companies, are more prone to product innovations and radical innovations, enabling gains in competitiveness and performance (Minguella-Rata et al., 2014). Therefore, collaboration and partnerships within supply chains can contribute to maintaining the performance and survival of companies in periods of uncertainty. Also, the collaboration of MSMEs with organizations that are not directly participating in the supply chains usually has a direct relationship with the operational innovations of the companies and their relationships, seeking to improve performance, including financial ones, in order to avoid typical problems of crisis’ period (Oke & Kach, 2012).

Regarding the main internal reasons for MSMEs that lead to participation in networks and collaborative processes, the following were identified (Casals, 2011): (i) learning and exchange of experiences, which can contribute to the innovation of MSMEs; (ii) possibility of innovation, through the exchange of knowledge, resources, and people; (iii) the possibility of complementing the unique resources of each MSME, whether physical, R&D, production, marketing or other resources; (iv) possibility of cost reduction by sharing resources and capacities; (v) increase in sales due to scale growth or reaching new markets; (vi) possibility of improving the quality of products and services; (vii) increased flexibility through outsourcing and collaboration in carrying out internal activities, by reducing costs and gaining flexibility; (viii) possibility of increasing competitiveness through access to external resources not available in the organization.

Despite these potential advantages for small businesses, academic and managerial production on the formation of small business networks highlights some resistance from entrepreneurs to participate in collective models for reasons such as lack of knowledge, fear of sharing resources, and lack of trust in people, among others (Carmo, 2022).

According to Casals (2011), the main problems and internal barriers for MSMEs to choose the collaboration process and participate in business networks are identified as: (i) long time needed to identify and choose suitable partners, which can be aggravated by unexpectedly arising crises; (ii) lack or absence of a strategic diagnosis of the crisis situation, both due to a lack of information and knowledge about the external environment, as well as a lack of a clear understanding of the collaboration process in cultural and strategic terms, which leads MSMEs not to analyze alternative or complementary businesses; the lower the level of training of the company's managers, the more these issues tend to accentuate their relevance; (iii) scarcity of resources and lack of conditions to offer something attractive to market; (iv) poor planning of the collaboration process, with decisions made by managers on impulse and without further

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analysis; (iv) individual behavior (of the manager) and fears about sharing their resources and internal knowledge. The lack of knowledge about the specific conditions and success factors of collaborations and network actions is one of the main reasons for MSMEs not to carry out collaborative processes, especially in the case of recent companies with no previous experience in collaboration.

Also, according to the study by Casals (2011), there are factors external to MSMEs that influence their decision to participate in a collaborative process or in a network of companies, among which are:

In terms of management: (i) prior knowledge and trust in collaboration partners; (ii) need to establish relationship rules, such as rights, duties, and contributions of participants; (iii) equality of powers and operating conditions; (iv) protection of participants' core competencies.

In social terms: (i) the need for a “shared vision of the world and business”; (ii) collaborative and integrative spirit; (iii) access to complementary external support through specialists and support organizations; (iv) learning ability and interest in knowledge exchange. This approach highlights the relevance of the external context, local and regional, in the decision and implementation of collaboration processes of companies and the constitution of MSMEs networks.

Such a scenario of the mentioned development of theories of collective actions and the discussions on the responses of small and medium-sized companies to unforeseen situations raises a question, which can be expressed as follows: Does collaboration and generating innovation minimize the impact of the crisis for MSMEs?

To support the discussion, data from the latest survey carried out by the Iberoamerican Observatory of MSMEs with support from FAEDPYME in 2021 (Lema et al., 2021), whose central theme was the strategy used by MSMEs in Brazil in an attempt to survive and maintenance themselves during the COVID 19 pandemic crisis.

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The methodological procedures of this study are discussed below.

### 3. Research Methodology

The present study follows an analytical strategy on collective actions of MSMEs in the pandemic crisis, using as a basis for discussion some of the results of the research entitled “Economic Impact of the COVID 19 Pandemic on MSMEs in Brazil in 2021”, carried out by the Iberoamerican Observatory of MSMEs with support FAEDPYME, with the participation of several Latin American countries, including Brazil (Lema et al., 2021).

The general objective of the research coordinated by FAEDPYME was to identify the impacts and alternatives found by Latin American MSMEs in 2021 facing the challenge of the COVID-19 pandemic crisis. The aforementioned research conducted by FAEDPYME consisted of an empirical study based on information collected with managers of 763 Brazilian MSMEs, located mainly in the states of Rio Grande do Sul and Santa Catarina (in the southern region of Brazil), Minas Gerais and São Paulo (in the southeast region), in addition to Sergipe, Pará, and Amazonas, these in a lesser extent. The sample is composed of micro-enterprises (6 to 9 workers), small enterprises (10 to 49), and medium-sized enterprises (50 to 249). The data collection technique used was a telephone survey and an online system. The survey was carried out with companies between February and May 2021.

The overall sample design is based on a non-statistical and convenience method. In this work, the following strata were used: economic sectors (industry, construction, commerce, services, and others) and company sizes (micro, small and medium-sized companies). Since the total of responses obtained from the companies is not entirely proportional to the population, statistical analysis of the set of aggregated results was used. It should be noted that the different tests and statistical contrasts that were performed in the subsequent phases of the analysis had their level of significance or degree of precision determined from the data actually obtained in the research (not counting the "missing" responses), according to with the statistical techniques HANSEN, P. B., GIGLIO, E. M., GEORGES, M. R. R., WEGNER, D.  
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used and the level of aggregation established in each situation. The number of valid questionnaires for each question varied, but an average of 750 responses was considered.

### 3.1 Variables and Measurement

To carry out the investigation, a questionnaire with 20 items was used, varying the response mode from binary (yes/no) through a 5-point Likert-type scale (from totally disagree to totally agree) and evaluation scales (with a scale of 1 to 5, with increasing importance).

From this questionnaire focusing on the "Economic Impact of the COVID-19 Pandemic on MSMEs in Brazil in 2021", the authors identified questions directly and indirectly, referring to collaboration, partnerships, networks, and innovation. The questions chosen to analyze collaboration, partnerships, networks, and innovation were: (i) the basic strata of analysis are those related to MSMEs that received external support and those that did not, considering the support received as a proxy of collaboration; (ii) performance of MSMEs in terms of employment, sales, revenue, indebtedness, liquidity; (iii) processes of external support received between young and mature companies, family and non-family companies, companies with university CEOs and not, with CEOs of both genders and from different sectors of activities; (iv) MSMEs that had their external relationships affected by supply chains; (v) MSMEs that had to adjust their organization with trading partners, in terms of purchases and supplies and in terms of trade and sales; (vi) different innovation processes developed by the companies surveyed and their results.

We analyzed the data with descriptive statistics involving percentages of stratification, participation, and importance and tests of significance of differences in the strata's means.

The next section presents the results of the analysis of these survey data.

## 4. Results' Presentation

The results obtained in the research are presented in this section. It is worth remembering that the original objective of the research “Economic impact of the COVID-19 Pandemic on MSMEs in Brazil in 2021” was to identify the impacts produced by the pandemic and not to answer the specific questions proposed by this article. However, it is believed that the results obtained may contribute to a better understanding of the theme of this article, which is to analyze and discuss the relevance of collaboration and possible responses in terms of innovation of MSMEs as a way of maintaining themselves during the pandemic crisis of COVID experienced by Brazil in the period 2020 and 2021.

The original survey covered a total of 763 MSMEs in Brazil, 24.7% from industry, 4.0% from construction, 10.3% from commerce, 39.3% from services, and 21.7% from other sectors. Still, as general information, 51.9% of the total number of participants in the survey are micro-companies, 32.8% are small, and 15.3% are medium-sized companies. The average age of companies is 18 years. The control of the management of the companies is predominantly familiar, with 65.6% of MSMEs governed by family members. It is also observed that 34.1% of the companies are managed by women, and 68.6% of the CEOs have a university degree. Only 19.6% of companies reported having benefited from government subsidies or benefits arising from the COVID19 pandemic, and 17.6% were beneficiaries of external mechanisms to support MSMEs, considered the collaborative processes of this analysis. At the time of the survey, 21.2% of companies were working with employees on a home office basis, and 35.4% expected to continue using home offices after the COVID-19 pandemic.

Regarding economic impacts, Table 1 presents some of the significant impacts of the pandemic on MSMEs, considering their size.

Table 1 – Economic impacts of the pandemic according to the companies’ size

| Impact                       | % micro-sized enterprises that identified the impact | % of small-sized enterprises that identified the impact | % of medium-sized enterprises that identified the impact |
|------------------------------|------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|
| Decline in employment        | 13.30                                                | 11.70                                                   | 16.40                                                    |
| Decline in sales             | 33.42                                                | 36.69                                                   | 22.60                                                    |
| Decline in revenue           | 54.47                                                | 52.63                                                   | 42.24                                                    |
| Negative impact on debt      | 47.80                                                | 40.81                                                   | 35.65                                                    |
| Negative impact on liquidity | 51.94                                                | 48.37                                                   | 36.20                                                    |

Source: The authors – based on Lema *et al.*, 2021.

Observing the results of Table 1, it appears that the economic impact of the pandemic on MSMEs was felt in all sizes of companies, with the most negative impacts in terms of revenue, indebtedness, and liquidity occurring in micro-companies.

Regarding the use of external support processes for MSMEs during the pandemic, Table 2 presents the results obtained on this topic.

Table 2 – Processes of external support to the MSMEs during the pandemic crisis (non-economic support)

| External Support         | % micro-sized enterprises | % of small-sized enterprises | % of medium-sized enterprises |
|--------------------------|---------------------------|------------------------------|-------------------------------|
| With external support    | 16.88                     | 15.92                        | 23.69                         |
| With no external support | 83.12                     | 84.08                        | 76.31                         |

Source: The authors – based on Lema *et al.*, 2021.

Checking the results of Table 2, it appears that a minority of MSMEs, between 15% and 25% of those surveyed, used some type of external support in the form of collaborations, partnerships, cooperation, and joint action in networks or other forms.

To verify whether external support contributed to reducing the economic impacts suffered by the companies under analysis, Tables 3A and 3B present the companies' assessment of the economic impact both for MSMEs that used support and those that did not use it.

Table 3A – Economic impacts during the pandemic in MSMEs according to external support received

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| Impact                | % of MSMEs that received external support | % of MSMEs that didn't receive external support |
|-----------------------|-------------------------------------------|-------------------------------------------------|
| Decline in employment | 38,4                                      | 31,0                                            |
| Decline in sales      | 54,9                                      | 45,5                                            |

Source: The authors – based on Lema *et al.*, 2021.

Based on the values in Table 3A, it can be observed that companies that had external support processes showed higher percentages of decline in jobs and decrease in sales compared to companies that did not have external support. On the other hand, looking at Table 3B, it can be seen that companies that had external support processes also evaluated, on average, higher negative economic impacts on revenue, indebtedness, and liquidity compared to those that did not use any external support.

Table 3B – Economic impacts during the pandemic in MSMEs according to external support received

| Impact                       | Evaluation (scale 1 to 5) of the level of impact on MSMEs that have received external support | Evaluation (scale 1 to 5) of the level of impact on MSMEs that have not received external support |
|------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Negative Impact on revenue   | 3.17                                                                                          | 3.16                                                                                              |
| Negative impact on debt      | 3.21                                                                                          | 2.85                                                                                              |
| Negative impact on liquidity | 3.06                                                                                          | 2.84                                                                                              |

Observation: no statistical difference between the groups was identified.

Source: The authors – based on Lema *et al.*, 2021.

Analyzing profile characteristics only of MSMEs that had received an external support process during the pandemic, 69.17% were family members, 66.66% were mature companies (>10 years of existence), 73.68% have CEOs (managers) with a university degree, and 64.39% have male CEOs (managers).

Also, when MSMEs surveyed were asked about their external relationships, they reported that their respective “supply chains” had been negatively affected as one of the most significant external impacts. However, in assessing the intensity of this impact, there is no

statistically significant difference between companies that had an external support process versus those that did not.

Now approaching the issue of innovations developed by MSMEs during the pandemic period, Table 4 presents the effect of these innovations, both for companies that had external support processes and those that did not receive them.

Table 4 – Innovations developed by the MSMEs that received and did not receive external support

| Types of Innovation                                                                 | Evaluation (scale 1 to 5) of the importance of innovation in MSMEs that have received external support | Evaluation (scale 1 to 5) of the importance of innovation in MSMEs that have not received external support |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Specific operational changes have been made                                         | 3.25                                                                                                   | 3.03                                                                                                       |
| Changes and improvements in existing products and services                          | 3.54                                                                                                   | 3.62                                                                                                       |
| Changes and improvements in internal production processes                           | 3.31                                                                                                   | 3.48                                                                                                       |
| Products and services have been changed to meet the requirements of new clients (*) | 3.18                                                                                                   | 3.22                                                                                                       |
| Changes and improvements in purchasing and supply (*)                               | 3.40                                                                                                   | 3.37                                                                                                       |
| Changes and improvements in sales (*)                                               | 3.32                                                                                                   | 3.49                                                                                                       |

Convention: (\*) indicates a statistical difference between the two groups of companies (those that have received external support and those that have not received external support)

Source: The authors – based on Lema *et al.*, 2021.

Observing the importance assessment values of several innovations developed by MSMEs during the pandemic crisis, there is no significant difference between the assessments of companies that had received external support and those that did not use this support, even in the types of innovation that can be related to the existence of external support processes (as collaboration).

Analyzing specifically the issue of some performance items of MSMEs, considering the strata of companies that innovated and those that did not, some surprising results can be observed in Table 5.

Table 5 – Economic impacts during the pandemic crisis in MSMEs that performed and not performed innovations

| Types of Impacts             | % of MSMEs that performed innovations in the period and had an economic impact | % of MSMEs that have not performed innovations in the period and had an economic impact |
|------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Decline in employment (*)    | 30.95                                                                          | 39.26                                                                                   |
| Decline in sales (*)         | 43.19                                                                          | 62.96                                                                                   |
| Decline in revenue (*)       | 50.00                                                                          | 24.69                                                                                   |
| Negative impact on debt      | 41.96                                                                          | 49.08                                                                                   |
| Negative impact on liquidity | 47.55                                                                          | 52.15                                                                                   |

Convention: (\*) indicates a statistical difference between the two groups of companies (those that performed innovations and those that did not perform innovations during the pandemic)

Source: The authors – based on Lema *et al.*, 2021.

Even though it is not possible to relate directly the innovation carried out by MSMEs with the processes of external support, the results in Table 5 allow the authors to identify that, in general, MSMEs that carried out innovations suffered a lower negative economic impact in most of the chosen indicators than those companies that did not innovate. A curious situation is verified in the negative economic impact on company revenues, where the percentage of MSMEs that reported this problem is more than double in those that innovated in relation to those that did not, which would not be expected according to literature.

The results are discussed in more detail in the next section.

## 5. Discussion of Results

Inter-organizational collaboration, notably the formation of networks, alliances, collaborations, and partnerships, has been considered in the literature as a relevant strategy for the competitiveness of micro, small and medium-sized enterprises - MSMEs (Balestrin &

Verschoore, 2016; Wegner, 2019). Case studies carried out during the Covid-19 pandemic also showed that small enterprises sought support from business partners to minimize the negative effects caused by the lockdown and the difficulties faced by most value chains. Foguesatto et al. (2021) and Zutshi et al. (2021) studied 34 cases that analyzed responses to the crisis. They suggested that collaboration is an effective action to help small businesses overcome negative situations caused by the pandemic crisis. Collaboration with stakeholders is suggested as a relevant strategy for the survival of small businesses during the Covid-19 crisis.

Observing the results analyzed in this work from the FAEDPYME survey 2021, some specific and particular issues are highlighted. Thus, the economic impacts suffered as indicated by the MSMEs surveyed (Table 1) are in accordance with the challenges indicated for these companies in periods of crisis by the OECD (2009), showing that they are already recognized and accepted conditions. If the impacts of job decline and sales decrease are disregarded, the other negative impacts (revenue, debt, and liquidity) were more severe in micro-enterprises, an aspect consistent with the greater lack of resources and conditions in general of these companies.

On the other hand, the low percentage of MSMEs that had used external support, between 15 and 25% of all companies surveyed (Table 2), presents a contradiction with the authors who suggest that collaboration and collective network actions can minimize the impacts of a crisis (Foguesatto et al., 2021; Zutshi et al., 2021). Perhaps this situation can be partially justified by the difficulties in creating networks and collaboration processes (Casals, 2011), considering that the pandemic broke out and evolved quickly, preventing a process of relationship and partnership building, as well as the lack of an adequate diagnosis by companies on the scope of this global crisis. A point to be noted concerns the fact that medium-sized companies were the ones that have received more external support, an aspect perhaps explained by their probable participation in national or global value chains due to their size and conditions.

Now analyzing the economic impacts suffered by the MSMEs surveyed in relation to whether or not they received and used external support, understood as a form of collaboration (Tables 3A and 3B), in terms of declining employment and decreased sales, MSMEs that received support external organizations performed worse than those that did not have this support process, which contradicts the results of other studies on the subject (Casals, 2011; Kossyva & Sarri, 2014; Vershoore & Balestrin, 2008). It is estimated that this condition of lack of concrete results from MSMEs that used external support processes can be partially justified by reasons similar to those in the previous paragraph, that is, lack of time for developing relationships and building partnerships and lack of an adequate diagnosis account of the scope of the global crisis. It should also be noted that the process of external support questioned to companies was not qualified, for example, in terms of actions internal to the supply/production chain or with participants external to it (Minguela-Rata et al., 2014).

Looking now specifically at MSMEs that received external support (understood as a collaborative process) during the pandemic period (Table 4), some points of interest are identified:

- About 2/3 (66.66%) of the companies that used external support (collaboration) were mature companies (>10 years of existence); in general, this result is closely related to the characteristics indicated by Kofler and Marcher (2018) and Brink (2018), that external collaborations are developed based on previous experiences of partnerships and joint actions, knowledge of the market and competitors and from previous crises, more common in mature companies;
- About ¾ (73.68%) of the companies that used external support (collaboration) were companies with university CEOs (managers), which, in a way, is in line with the ideas of Casals (2011), where relevant aspects for the use of collaborations such as adequate

analysis of the scenario, use of new business techniques such as e-commerce and delivery services, among others, can influence the collaboration process.

- The low level of external support presented by young companies ( $\leq 10$  years) is believed to be associated with the lack of the characteristics present in the mature companies mentioned above;
- An issue not analyzed in the present work concerns the possible difference in levels of external support (collaboration) of the different sectors of economic activities (industry, construction, commerce, services, and others). The different lines of business present different characteristics of the degree of internal dependence of the chain, the knowledge and previous trust in the agents, and the collaborative spirit, among others, linked to the social aspects (Casals, 2011).

Analyzing the innovations here, in terms of improvements or new activities of MSMEs during the COVID-19 pandemic crisis, they can be observed from two prisms: those associated with external support (collaboration) and those typically internal. Thus, considering the internal improvements to MSMEs, it appears that, except for the improvement of specific operational aspects, the improvements introduced proved to be more significant and intense in MSMEs that did not have external support, in general using concepts and actions discussed by OECD (2009), seeking actions such as cost reduction (materials and labor), reductions in the level of production and canceling investments.

Observing below the innovations linked to companies that received external support (collaboration), such as meeting new customers and demands, improvements in purchases and supplies, and improvements in the commercial and sales sector, in general, these proved to be less significant than the same one's innovations of companies that did not carry out collaborative actions. Perhaps this condition is also linked to barriers to successful MSME collaboration

(Casals, 2011), such as the lack of adequate planning for the collaboration process, fears of knowledge sharing, and individualistic behavior, among other aspects.

On the other hand, considering the role of innovations developed by MSMEs during the pandemic crisis (Table 5), although it cannot be linked to the external support processes received by these companies, it appears that the innovations allowed a smaller negative impact on indicators such as a decline in employment, a decrease in sales and a negative impact on indebtedness and liquidity for companies that adopted them in relation to those that did not innovate. It is noteworthy that MSMEs that carried out innovations reported a lower negative impact on sales than companies that did not carry out innovations, while the former indicated a much more intense negative impact, in terms of the number of companies affected, in terms of revenue, which seems contradictory. However, it should be remembered that only a few indicators are being evaluated in this study, and there may be other unassessed elements that have contributed to this situation, such as, for example, investments with a longer maturation period or even innovations not suitable for the environment in the period.

Considering the analysis carried out in this research based on the response of 763 micros, small and medium-sized Brazilian companies, the data do not confirm the presence or increase of collective actions and collaborative innovations. Thus, it was found that in the face of crisis situations, entrepreneurs focused on their internal processes and resources, not seeking partnerships. A possible interpretation is that the paradigm of acting in isolation predominates in the attitude and decision of entrepreneurs when faced with pressures and external difficulties.

Although the provision of subsidies and support to small businesses has been treated as a central issue by many governments, the results of this survey indicate that they did not impact the results of the companies that benefited. Therefore, this quantitative research indicates results different from those reported by case studies (Foguesatto et al., 2021) and study reviews (Zutshi et al., 2021).

In line with the behavior of seeking solutions in their own resources and processes, the answers about innovations are predominantly improvements or incremental innovations, adjustments in the existing production, and commercialization modes. The innovations carried out by the companies surveyed cannot be linked to collaboration processes and, in part, reduced the negative economic impacts of the pandemic, despite not having contributed to all the indicators analyzed. There was even a contradiction in terms of the decrease in negative impacts on sales, not consistent with a more significant negative impact on revenues concerning companies that did not innovate.

Therefore, the main answer to the objective of this study is that there was no increase in collective actions. About innovations, they are focused on the adjustments of processes and internal structures of each organization. The results are not aligned with the approaches in the literature on the subject.

Considering the analysis of the results obtained in this work, some comments can be made based on conclusions in the next section.

## 6. Final Considerations

This article aims to analyze the relevance of collaboration and possible responses in innovation by micro, small and medium-sized companies to maintain themselves during the COVID pandemic experienced by Brazil in the period 2020 and 2021. Data analyses and statistical tests were carried based on the responses of 763 micro, small, and medium-sized Brazilian companies that participated in the survey called “Economic impact of the COVID 19 Pandemic on MSMEs in Brazil in 2021” out to achieve the proposed objective. Specifically, the instrument's questions referred to external support (as a proxy for collaboration), questions about innovations carried out by companies, and the perception of entrepreneurs about the impact of the crisis on sales, revenue, indebtedness, liquidity, and jobs were specifically considered.

Considering some of the factors that influence the decision of companies to participate in a network or a collaboration process indicated by authors such as Casals (2011), it is believed that issues such as lack of time to choose partners, inadequate diagnosis of the severity and the extent of the crisis and the lack of planning about the operating conditions of MSMEs, caused by the rapid onset of the health crisis, ended up causing a low percentage of companies that adopt external support processes. However, given that the aforementioned external support used by MSMEs was not adequately detailed in the research, it would be relevant to investigate the reasons for the low use, if linked to institutional issues, bureaucratic difficulties, lack of external stimulus, lack of trust in possible partners, to an individualistic position of the managers of the companies or other issues.

This result contributes to theory and practice as it contradicts previous studies that pointed to the importance of collaboration during the pandemic (Foguesatto et al., 2021; Zutshi et al., 2021) to minimize the impacts of the crisis.

On the other hand, in addition to the low level of external support processes by the MSMEs, despite not being adequately detailed, such support processes do not seem to have been the most adequate since the companies that used these processes did not have better results in mitigating the negative impacts of the crisis than those companies that did not receive external support. This condition raises another relevant issue: the simple use of external support or collaboration processes is not enough to achieve adequate performance results. Still, there is a need to identify the appropriate collaboration processes for each crisis and the context of each company's action, considering both internal and external aspects of the companies (Casals, 2011; Kossyva & Sarri, 2014).

In this sense, it would be convenient to research and detail the external support processes employed by companies during the pandemic due to the poor result presented. From an applied perspective and the formulation of public policies, this result suggests that external support to  
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small enterprises did not generate the expected results and allows raising debates on the most effective way to support these enterprises in times of crisis.

Two aspects stand out, looking specifically at the MSMEs that have received external support. The first concerns the fact that most companies that used external support were mature (> 10 years of existence), which seems to confirm some of the factors that lead to the adoption of collaborations (Kofler & Marcher, 2018; Brink, 2018), such as knowledge of the market and potential partners, previous collaboration experiences, long-standing relationships and trust with business partners. However, it would be convenient to research what drives companies to adopt collaborative processes or network operations in times of crisis to support sectoral and public policies more effectively with ways to minimize the impacts of crises.

The second aspect concerns the fact that most companies that used external support also had managers with a university degree, which also seems to confirm the relevance of factors that lead to collaboration between similar companies (Casals, 2011) as those of the previous item. Here, too, it would be advisable to research and understand the effective motivation of these managers for external support and collaboration processes.

Finally, this research work contributes to the literature on collaboration and innovation between companies, specifically MSMEs, by verifying that not all the authors' postulations on the subject were verified in a practical way in the health and economic crisis associated with the COVID-19 pandemic. The result implies the need for new studies and research to identify which factors and aspects effectively allow successful collaborative processes that contribute to the survival and performance of companies in periods of crisis, which will certainly come in the future.

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