Innovation amidst chaos: the case of Ibero-American MSMEs

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Abstract

In this study, we analyze how innovation influenced the performance of over 8,000 micro, small, and medium-sized enterprises (MSMEs) across Ibero-America during the COVID-19 pandemic. Our findings reveal the extensive impact of the crisis on MSMEs, with family-owned firms experiencing greater setbacks and larger firms demonstrating more resilience. We also found that the crisis prompted diverse innovation practices –ranging from new products and services to improved processes, management, and sales strategies – that mediated the negative effects of the pandemic (operational disruptions, declining sales, increased default rates, and canceled investments). These innovations fostered better outcomes for MSMEs, reflected in increased revenues, profitability, productivity, liquidity, and reduced indebtedness. Our discussion highlights how these results deepen the understanding of innovation's role in enhancing MSME resilience in times of crisis.

Keywords: micro, small, and medium-sized enterprises; MSMEs; innovation; performance; COVID-19; crises.

1. Introduction

The COVID-19 pandemic disrupted businesses worldwide with unprecedented speed and strength. Micro, small and medium enterprises (MSMEs), however, bore the brunt of the crisis. With fewer resources and capabilities than larger firms, millions of MSMEs were vanquished (Eggers, 2020; Belitski et al., 2021). Many others have experienced an ordeal that lingered for many months (Marconatto et al., 2022; Marconatto et al., 2024).

The policies to stop the pandemic brought the economy to a standstill. Temporary closures, curfews, and other restrictions on mobility reduced drastically or even zeroed the sales of most MSMEs (Cowling et al., 2020). Many of those that kept their doors open had no inventory to serve their customers due to the interruptions of global chains (Etemad, 2020). Finally, massive layoffs combined with the chaos and uncertainty that took over the economy and everyday life led families to cut down their spending substantially. As a result, the pandemic forced MSMEs to adapt their operations and cancel investments (Sharma et al., 2023).

Among major European countries, Spanish MSMEs seem to have suffered the most. According to a McKinsey report (Dimson et al., 2020), they exhibited the worst performance in the region, with 80% of these firms experiencing a significant revenue drop. Nevertheless, the damage was particularly acute in developing parts of the globe, like Latin America (Adian et al., 2020). The lack of a sound financial infrastructure, inefficient or absent policies supporting MSMEs during the pandemic, their lower levels

of productivity and technological specialization, and rampant informality aligned into a perfect storm that destroyed millions of firms and jobs (Sibanda et al., 2021).

Among the actions taken by businesses to cope with the pandemic, innovation certainly stands out (Sharma et al., 2022; Sharma et al., 2023). Different studies have shown that small companies reacted to the pandemic and other crises by adapting or creating new operations, products, services and even business models (e.g., Mosconi & Blais, 2024; Ahamed, 2024; Kraus et al., 2020; Sharma et al., 2023).

However, the extant literature still lacks robust evidence about how innovation moderates the impact of major crises on the performance of MSMEs in developing regions and countries (Gunawan et al., 2022). As Belitski et al. (2021) show, most studies on small businesses and black swans were conducted in affluent nations where MSMEs usually have readily access to a wide supporting net. Thus, although scholars agree that innovation is a common response to crises, we know little about how much it can minimize the negative external impacts on the performance of small firms in world regions that are either underdeveloped or where MSMEs find scarce external help.

The lack of robust evidence on the relationship between innovation and the performance of MSMEs operating in such regions during the COVID-19 pandemic is worrying for three reasons, the first two being strongly interrelated. First, the negative impact of the crisis on firm performance was much more pronounced in smaller businesses (Shen et al., 2020). Second, MSMEs have long been known to have fewer resources and capabilities to innovate and thrive (Storey, 1994). Usually, they lack capabilities and assets linked to successful innovations and present lower levels of technology adoption (Love & Roper, 2015). They also tend to have poorer management skills (Rauch & Freese, 2000), limited

access to financing (Beck et al., 2005), small market reach and brand recognition (Hills et al., 2008). Their liability of smallness and newness (Stinchcombe, 1965) makes attracting and retaining financial capital, capable human resources and customers challenging (Rutherford et al., 2003; Eggers et al., 2020).

Third, poorer countries offer all kinds of barriers for MSMEs to innovate and improve their performance. Many of these nations offer limited digital infrastructure and access to technology, insufficient government support and workforces challenges, such as widespread digital illiteracy (Sharma et al., 2023). Other issues include deficient rule of law, governmental corruption, rampant informality, and crippling state bureaucracy and taxation (Urbano et al., 2019; World Bank, 2019). These and other problems, such as violence and lack of an innovation culture, threaten the very existence of MSMEs, let alone their ability to devise new processes and create new products and services (Minh & Hjortsø, 2015; Kadriu et al., 2019; Freel, 2000).

However, despite such shortcomings and even amidst the desperate COVID-19 pandemic context, some MSMEs showed remarkable resilience. That is, in many industries, not only in those few that were positively affected by the COVID-19 pandemic, but some entrepreneurs also managed to weather the storm (see Marconatto et al., 2022; Marconatto et al., 2024). As smaller firms form the economic backbone of countries (Kuratko & Audretsch, 2021) and play a crucial role as the agents of economic recovery (Cowling et al., 2020; Herbane, 2019), these successful firms are beacons of hope. Learning from these businesses should help other MSMEs survive and thrive in chaotic contexts (Herbane, 2010; Peric & Vitezic, 2016; Thorgren & Williams, 2020), which seems to be the "new paradigm of business as usual" (Herbane, 2019, pp. 488–489).

In this paper, we analyzed the impact of the COVID-19 pandemic on the performance of more than 8,000 MSMEs located in Latin America and Spain. More specifically, we investigated how innovation mediated such a relationship. The damage caused by the pandemic (operational disruptions, forced changes in business practices, abrupt declines in sales, spikes in default rates, and the cancellation of expansion investments), the innovation efforts (enhancing or creating new products and services, process and management improvements, new sales processes and strategies) and the performance of MSMEs (revenue, ROI, productivity, company indebtedness, liquidity and investment power) were measured in broad terms.

Our findings indicate that the crisis directly impacted MSME performance, with family-owned firms experiencing greater setbacks and larger MSMEs showing more resilience. However, the crisis also spurred innovation practices that positively mediated its effects, ultimately mitigating the negative impact of the pandemic on these businesses' performance. This observation is somewhat unexpected because of the poor resource status usually attached to MSMEs (Rauch & Freese, 2000; Love & Roper, 2015), the restrictions imposed on them by the pandemic and its deleterious effects on their performance (Adian et al., 2020), and the fact that innovation benefits tend to take some time to ripe (Rosenbusch et al., 2011; Triguero et al., 2014).

Our study demonstrates that innovation is both feasible and beneficial even under extreme circumstances, encouraging MSME owners and managers to actively pursue improvements and create new processes, products, business models, and sales operations. This emphasis on innovation is especially valuable given the crucial economic and social roles MSMEs play globally (Kuratko & Audretsch, 2021). Furthermore, disruptions

within the MSME sector tend to severely impact the broader economy (Pedauga et al., 2021), underscoring the importance of resilience and adaptability in these enterprises.

Our findings corroborate many studies that stress the need for policymakers to build better-supporting frameworks to help MSMEs innovate and become more resilient (Sharma et al., 2022). According to Sharma et al. (2023), most current policy support often focuses on short-term survival rather than fostering a conducive environment for long-term innovation and resilience among smaller businesses. This is particularly critical in developing countries, known for their lack of support to MSMEs (World Bank, 2019). Smaller and family-owned MSMEs need special attention, as they comprise the vast majority of these firms across the world (Zapata-Cantu et al., 2022).

Finally, we contribute to the growing body of literature on MSME innovation in crisis contexts, particularly the COVID-19 pandemic. Our observations go beyond the bulk of these studies, which stressed either the role of digitization or individual types of innovation in helping those firms weather the crisis. Our results indicate, instead, that MSMEs respond more positively to external shocks when they engage in multiple innovation practices.

2. Literature review and hypotheses development

2.1 The impact of the COVID-19 pandemic on MSMEs

The COVID-19 pandemic was unprecedented in terms of both reach and impact. In 39 months (between Jan 2020 and May 2023), more than 7 million people perished around

the world, victims of the new virus (Rigby & Satija, 2023). Every country was affected, making it one of the worst pandemics in world history.

The loss of lives was accompanied by deep economic devastation, as the measures taken to protect populations plunged the world into the harshest recession since the Great Depression (IMF, 2021). In 2020, Spain, for instance, saw its GDP shrink by a staggering 11.2%, the worst drop in the entire European continent (World Bank, 2024). Its unemployment rate skyrocketed to 16.2% (Eurostat, 2021), and the number of international tourists decreased by 77% (Vayá et al., 2023), crippling the country's chief industry.

Poorer regions suffered even more. Weaker health infrastructure and economic institutions, widespread informality and the lack of public safety nets combined into a gigantic storm that swept entire industries (World Bank, 2020). As a result, according to the Word Bank Open Data (2024), the Caribbean and Latin American economies shrunk by 6.6% in 2020, against a 2.2% contraction observed in the USA.

However, the real magnitude of the economic catastrophe can be grasped when one observes the pandemic's effects on MSMEs in such regions (Verma & Gustafsson, 2020; Restrepo-Morales et al., 2024). Representing the absolute majority of businesses, these firms bore the brunt of the COVID-19 disaster.

Only in Brazil, during the first wave of the disease, over 700 thousand MSMEs shut their doors, and more than US$4 billion in productive capital was destroyed (Nogueira & Moreira, 2023). In Malaysia, SMEs experienced revenue losses of more than 50% (Rashid et al., 2022). Similar numbers can be observed in Nigeria and other countries of

the Global South (Okoroafor, 2023). The pandemic impacted MSMEs in 5 interrelated ways.

A) *Forced changes in operations*. The operations of most MSMEs were severely disrupted in peripheral regions like Africa (Okoroafor, 2023), South Asia (Sarker et al., 2022) and Latin America (Restrepo-Morales et al., 2024). Spanish MSMEs followed the same ordeal (Pedauga et al., 2021). Social distancing, curfews, temporary closures, and other policies aimed at halting the spreading of the virus left business owners with the only option of adapting to a completely new and harsh reality. Remote working, changes in work shifts and procedures, and multiple adjustments of processes are some examples of practices that had to be forcefully adopted by MSMEs striving for survival (Kuckertz et al., 2020).

B) *Forced adjustments in products and services*. Likewise, most MSMEs had to adapt their offers to a pandemic-ridden market (Sarker et al., 2022; Pedauga et al., 2021). Movement restrictions, fear of contamination, shortage of raw materials and less appetite for consumption led those firms to change their products and services. Many had to start catering their products to the customers' houses, and others changed their business offerings entirely simply because their former value propositions would become completely inviable in the new context (Bettiol et al., 2023).

C) *Canceling of sales orders*. A wicked combination of widespread contamination, disruptions of supply chains, restrictions of all sorts, and massive layoffs and bankruptcies caused a sudden drop in consumption (Yannelis & Amato, 2023), leading to the cancellation of outstanding sales orders. The pandemic storm

created an atmosphere of pervasive uncertainty and fear, further reducing the consumption intention of entire populations. The inevitable result was the downward spiral of sales with drastic effects on MSMEs' cash flow and financial viability (Marconatto et al., 2024).

D) *Rise of default rates*. Another immediate development of the economic catastrophe caused by the pandemic was the systemic rise of default rates across industries (OECD, 2022). The acute contraction of sales, the spike in unemployment and the struggle to save cash encouraged consumers and businesses alike to retard or avoid paying their debts, creating a vicious cycle of economic destruction. In Brazil, for instance, the post-pandemic defaults haunt smaller businesses up to this day (Shinohara & Pereira, 2024).

E) *Canceling of investments*. Unpredictable stay-at-home orders, general shutdowns, and the lack of any foreseen end to the ordeal made business owners highly risk-averse regarding investments (Sharma et al., 2023). These unprecedented levels of uncertainty and fear brought by the pandemic to the economy halted the prospects of investments by smaller companies in general (García-Pérez-De-Lema et al., 2022). R&D efforts and the acquisition of productive assets were postponed or called off entirely (Roper & Turner, 2020).

As expected, the vicious cycle formed by these 5 destructive forces crushed the performance of most MSMEs that escaped complete obliteration. The severe sales decline caused *revenues* and *profits* to take a nosedive, dragging along the *returns over investments* (Bartik et al., 2020). These firms became cash-starved as their *liquidity* was drained by continuing costs in the absence of former sales levels (Cowling et al., 2020),

a phenomenon specially observed in Spain (Pedauga et al., 2021). As a direct result, they lost their *investment power* (Roper & Turner, 2020) and saw their *indebtedness* skyrocket (Kalemli-Ozcan et al., 2020).

H1. *The COVID-19 pandemic negatively influenced the performance of MSMEs in Ibero-America.*

Knowingly, larger MSMEs will tend to have more resources and capabilities to create new processes and products. On the contrary, smaller firms are more likely to lack basic assets and managerial skills critical for their survival and performance amidst crises (Gupta & Singh, 2022). This observation is substantiated by studies conducted in Ibero-American countries showing that smallness is a liability that decreases the profitability and survival odds of MSMEs (e.g., Fonseca et al., 2021). Thus, even though smaller MSMEs might benefit from the nimbleness linked to their leanness (Uhlaner et al., 2012), most evidence leads us to believe that:

H2a. *Larger firm size mitigated the effects of the pandemic on Ibero-American MSMEs' performance.*

Family ownership is another characteristic that affects the ability of firms to cope with crises. Studying a sample of German SMEs, Classen et al. (2013) found that family firms have a higher propensity to innovate and achieve higher process innovation outcomes. In their systematic literature review, Baltazar et al. (2023) identified that family businesses

are better at 'doing more with less,' which is certainly an important ability in crises. Zapata-Cantu et al. (2023) argue that family businesses often have streamlined decision-making processes, an asset during crises, as it allows these MSMEs to pivot and implement strategies more swiftly than non-family firms. Jarchow et al. (2023) concluded that family control positively impacts firm performance and valuation in times of crisis. Finally, Miroshnychenko et al. (2023) found that family firms' financial performance was significantly higher than that of nonfamily firms during the COVID-19 pandemic. Family firms' stronger long-term and flexible decision-making orientation, social capital, and resource availability would explain this outcome. Thus, we argue that:

H2b. *Family ownership mitigated the effects of the pandemic on Ibero-American MSMEs' performance.*

2.2. Innovation amidst chaos

Crises have long been identified as triggers for innovation, as they play a crucial role in driving change and adaptation (Gopalakrishnan & Kovoor-Misra, 2021). Accordingly, many studies identified that change and innovation were common among small businesses across the world during the COVID-19 crisis (see Ebersberger & Kuckertz, 2020; Seetharaman, 2020). In a large bibliometric analysis of 135 research articles on SMEs' strategies for tackling the pandemic, Sharma et al. (2023) identified innovation as one of the most important approaches employed by these organizations. Specifically, in

Ibero-America, Restrepo-Morales et al. (2024) analyzed a sample of over 9,000 firms to find that the pandemic increased the level of innovativeness of local SMEs.

Many other studies indicated that MSMEs used innovation as a strategy to absorb the shock caused by the pandemic. The available evidence suggests that five innovation practices were predominantly employed by those firms: (a) pivoting of existing products and services, and (b) creation of new offers (Gopalakrishnan et al., 2021); (c) improving or creating new organizational processes (Gopalakrishnan et al., 2021); (d) pivoting of business models (see Seetharaman, 2020; Clauss et al., 2021); and (e) new sales practices and strategies (Adam & Alarifi, 2021).

All these innovation practices are closely interrelated as each tends to depend on or cause others. Their symbioses can be seen in the intensive adoption of technology and digitization, which played a critical role in the transformation of many MSMEs during the pandemic (Verma & Gustafsson, 2020; Mosconi & Blais, 2024; Ahamed, 2024; Bettiol et al., 2023), as it seems to permeate all five innovation practices. We illustrate the argument using the following three examples.

Bettiol et al. (2023) showed that Italian SMEs used ICTs and Industry 4.0 data-processing technologies to innovate their processes and servitize their offers during the crisis. Using a sample of 268 Tasmanian retail and consumer service SMEs, Grimmer (2022) observed that firms responded to the havoc brought by the pandemic through the adaption and creation of new products and services, which required the change and improvement of their processes, new marketing efforts and the promotion of 'localness'. Seetharaman (2020) explained how the pandemic triggered business model shifts through the adoption of new technologies and processes to create new value propositions for the market.

Thus, considering the pervasive role played by innovation amongst smaller firms during the COVID-19 crisis, we argue that despite their internal and external challenges and their 'poor resource status':

***H3**: The COVID-19 pandemic led MSMEs in Ibero-America to actively engage in innovation.*

2.3. The impact of innovation on MSMEs' performance

The available evidence on the relationship between innovation and MSMEs performance tends to point out a positive effect of the former on the latter (Sepúlveda & Collazos, 2023; Expósito & Sanchis-Llopis, 2019; Rosenbusch et al., 2011).

However, the hype around innovation can be so noisy that one may forget that being innovative *per se* does not *always* lead to superior results. For instance, Gök and Peker (2016) identified a negative relationship between innovation and financial performance in a sample of 305 Turkish firms. While pre-crisis innovation was found to improve a firm's survival odds and performance thereafter (Khan et al., 2022), Liem et al. (2019) encountered in a study with 3,500 Vietnamese SMEs that the reactive innovation so commonly implemented during crises negatively affected their performance. Additionally, the meta-analysis by Rosenbusch et al. (2011) shows that the innovation-performance relationship in the realm of smaller firms is context-dependent and not always positive. In the same vein, Kijkasiwat and Phuensane (2020) analyzed almost 13,000 SMEs from Eastern Europe and Asia to find that the impact of innovation on firm

performance is moderated and mediated by different factors. These findings suggest clearly that the question is not settled yet.

When it comes to MSMEs operating in the poorer regions, the relationship between innovation and firm performance becomes even blurrier. As we discussed at the outset of our paper, developing countries offer critical challenges on many fronts, turning the odds against the success of those firms. This becomes evident when one looks at international rankings such as the Global Entrepreneurship Index (Ács et al., 2019) and the Global Entrepreneurship Monitor (GEM, 2023). Latin American countries, for instance, consistently rank lower than developed nations in every innovation-related measure (e.g., R&D transfer, product and process innovation, entrepreneurial education, technology absorption, human capital etc.), a clear signal that local small firms would be less likely to innovate successfully. And it stands to reason that the havoc unleashed by the COVID-19 pandemic would make this outcome even less likely.

However, despite all the challenges, the few existent analyses on the innovation and firm performance of MSMEs operating in developing countries indicate a positive relationship between the two. In a study involving 206 Indonesian SMEs, Rumanti et al (2022) identified that innovation increased their financial and operational performance. Adam and Alarifi (2021) studied 259 Saudi Arabian SMEs and concluded that their innovation practices during COVID-19 impacted positively their survival odds and performance. El Chaarani's et al. (2022) study in Lebanon involving a sample of 426 firms showed that marketing and process innovation influenced financial performance positively. This evidence suggests that the performance of MSMEs can be enhanced in times of crisis if they demonstrate the capability to innovate.

H4: *Innovation positively mediated the influence of the COVID-19 pandemic on the performance of MSMEs in Ibero-America.*

In Figure 1, we illustrate our conceptual framework and the hypotheses underpinning our study.

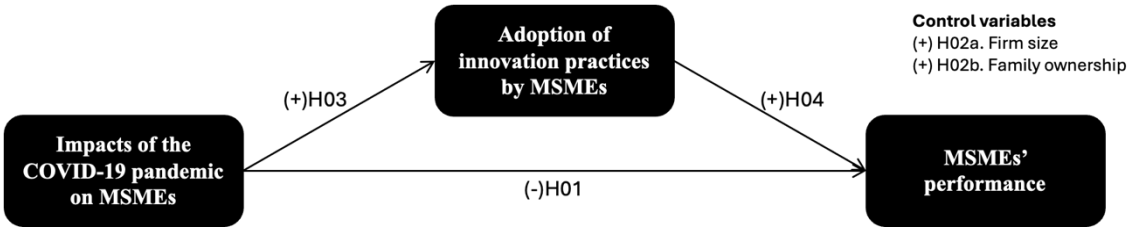

Figure 1. Conceptual framework and hypotheses

4. Method

4.1 Sample and Data

The sample for this study comprises MSMEs from 14 countries within the Ibero-American community. Data were collected between April and June 2022 by researchers affiliated with the Ibero-American Observatory of Micro, Small, and Medium Enterprises (MIPyME), managed by the Fundación para el Análisis Estratégico y Desarrollo de la Pyme (FAEDPYME). The final sample consisted of 8,456 Ibero-American SMEs from the countries listed in Table 1.

Table 1: Sample

Country	Total companies	Percentage of total sample
Spain	1507	17,8%
Mexico	1483	17,5%
Colombia	1237	14,6%
Ecuador	992	11,7%
Brazil	707	8,4%
Argentina	501	5,9%
Panama	389	4,6%
Costa Rica	378	4,5%
Paraguay	338	4,0%
Chile	285	3,4%
El Salvador	242	2,9%
Uruguay	189	2,2%
Honduras	164	1,9%
Guatemala	44	0,5%
Total	**8456**	**100,0**

Source: research database (2021)

We used the G*Power software to perform a post hoc statistical power analysis, assuming that the effect size in the sample reflects that of the population (Ellis, 2010). Cohen's (1988) (f^2) analysis was applied, suitable for models with repeated measures and hierarchical data where variables are continuous (Goulet-Pelletier & Cousineau, 2018). With (f^2 = 0.15), a confidence level of (alpha = 0.05) (Cohen, 1988; Hair et al., 2019), and statistical power (beta = 1.000), we concluded that the sample is sufficient to reject the null hypothesis (H_0), minimizing Type II error. Table 2 presents the main characteristics of the sampled firms.

Table 2: Sample characteristics

Variable	Category	Frequency	Percentage
Company size	Microenterprise	4425	52,3
	Small	2815	33,3
	Medium	1216	14,4
Business sector	Services	2702	32
	Manufacturing Industry	1873	22,1
	Commerce	1037	12,3

	Other activities	876	10,4
	Primary sector	747	8,8
	Energy, Water, Recycling	565	6,7
	Construction	398	4,7
	Extractive Industry	258	3,1
Family control	Yes	5838	69
	No	2618	31
Company's operating time	Young (≦ 10 years)	4308	50,9
	Mature (≧ 10 years)	4148	49,1

Source: research database (2021)

4.2 Measures

The questionnaire developed and applied by FAEDPYME aimed to (i) estimate the impact of the COVID-19 pandemic on various economic-financial indicators to identify the main challenges faced by firms, (ii) determine the impact of the economic crisis generated by COVID-19 on firms, and (iii) study the innovative activities of SMEs. It asked respondents to evaluate various dimensions, including:

i. *Dependent Variable:* Performance, measured through indicators such as revenue, profitability, investments, debt levels, and liquidity (Serrasqueiro et al., 2023)
ii. *Independent Variable:* The COVID-19 pandemic, assessed through impacts on client and supplier activities, operational activities, and strategic activities (Danielak, 2021; Pedauga, 2022).
iii. *Mediating Variable:* Innovation in products and processes, measured through (1) changes or improvements in products/services; (2) commercialization of new products/services; (3) changes or improvements in production processes; and (4) acquisition of new equipment (Caballero-Morales, 2021; El Chaarani et al., 2022). Managerial innovation was assessed through (1) changes in management systems

and leadership, (2) procurement and supply processes, and (3) marketing and sales (Adam & Alarifi, 2021; Bodziany et al., 2021).

iv. *Control Variables:* Firm size (Sogorb-Mira 2005; Serrasqueiro et al., 2018) and family control (Dummy variable: 0 = non-family; 1 = family-controlled) (De Massis et al., 2015; Lwango et al., 2017).

All items were measured using observable variables on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

Data collection was conducted through an online survey, complemented by telephone follow-ups, using a common platform accessible to all research teams distributed across 14 countries. Using a unified data collection platform ensured standardized data entry and coding procedures.

4.3 Multivariate Analysis

We used the PLS-SEM method to analyze the data. The first step in evaluating PLS-SEM results involves examining the measurement models. If the measurement models meet the required criteria, the structural model is then assessed (Hair et al., 2017).

5 Results

5.1 Evaluation of the measurement model

We began the evaluation of measurement models with an analysis of the indicators: (i) Average Variance Extracted (≥ 0.5); (ii) Cronbach's Alpha (≥ 0.7); and (iii) Composite Reliability (≥ 0.7) (Hair et al., 2019; Dijkstra & Henseler, 2015; Souza-Bido & Silva, 2019).

In the initial analysis, we observed that the constructs presented an AVE < 0.50. Variables with lower factor loadings were then removed from the model to achieve the minimum acceptable AVE value. Specifically, seven variables from the management activities dimension (FE1 = 0.491; FE4 = 0.466; FE6 = 0.195; FE7 = 0.517; FE9 = 0.557; FE10 = 0.476) and two variables from the innovation dimension (INOV4 = 0.337; INOV6 = 0.675) were excluded.

Although the AVE for the Impact of the pandemic dimension remained below 50% (AVE = 0.363), the Fornell-Larcker criterion was not violated. Fornell and Larcker (1981) suggest that a minimum value of 0.36 may be acceptable if considered alongside other model validity indicators, all of which showed satisfactory results. Table 03 presents the model indicators, confirming that all constructs exhibit convergent validity, construct reliability, and internal reliability.

Table 03: Convergent Validity and Construct Reliability

Dimensions	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
Impact of the pandemic	0.744	0.745	0.738	0.363
Innovation	0.896	0.897	0.895	0.631
Performance	0.931	0.932	0.932	0.694

Source: research database (2021)

Next, we assessed discriminant validity (DV) using the Fornell-Larcker criterion, given that the model is reflective. The discriminant validity test measures the extent to which the variances in the indicators explain the variance in the construct (Afthanorhan, 2013). The discriminant validity value is derived from the square root of the AVE value. The diagonal values (in bold) in Table 04 represent the square root of the AVE, while the other values represent the correlations between the respective constructs. Discriminant validity is confirmed when a diagonal bold value exceeds the corresponding values in its row and column. Thus, we confirmed the model's discriminant validity.

Table 04: Discriminant Validity Using the Fornell-Larcker Criterion

Dimensions	Impact of the pandemic	Innovation	Performance
Impact of the pandemic	**0.602**		
Innovation	0.357	**0.794**	
Performance	-0.373	0.116	**0.833**

Source: research database (2021)

To confirm discriminant validity, we also examined the cross-loading values, which indicated the existence of higher factor loadings on their respective latent variables (or constructs) compared to other latent variables (Chin, 1998). The results of the analysis of convergent validity, discriminant validity, and reliability indicated a positive evaluation of the measurement model. Thus, it can be concluded that the variables were appropriately measured and meet the requirements of validity and reliability.

5.2 Evaluation of the structural model

The evaluation of the structural model includes the analysis of determination coefficients (R^2) and the size and significance of path coefficients (T) (Hair et al., 2019). For the estimation process in path modeling, we employed Bootstrapping, a non-parametric procedure that tests the statistical significance of various results in the PLS-SEM model. The initial step of the analysis involves assessing Pearson's determination coefficients (R^2), which measure the proportion of variance in endogenous variables explained by the structural model. In social and behavioral sciences, Cohen (1988) suggested that an R^2 of 2% is categorized as a small effect, 13% as a medium effect, and 26% as a large effect. Accordingly, we observed moderate effects, as shown in Table 05.

Table 05: Evaluation of Pearson's Determination Coefficients (R^2)

Dimensions	R^2	Adjusted R^2
Impact of the pandemic	*	*
Innovation	0.127	0.127
Performance	0.210	0.210

Note: The COVID-19 pandemic impact dimension does not have an R^2 value because it is an independent variable in the SEM.
Source: research database (2021)

Next, we analyzed correlation and linear regression coefficients within the structural equation modeling (SEM) framework. The objective was to investigate the model's predictive capacity and the interactions between constructs, as discussed by Hair et al. (2019). For this purpose, we interpreted the path coefficients (T), where values greater than 1.96 indicate p-values ≤ 0.05

(falling between −1.96 and +1.96, with a 95% probability in a normal distribution). Table 06 shows the results of these analysis.

Table 06: Evaluation of the Structural Model

Hypothesis	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
H01. The COVID-19 pandemic had a negative effect on the performance of MSMEs in Ibero-America.	-0,363*	0,009	38,807	0,000	Accepted
H02a. Larger firm size mitigated the effects of the pandemic on Ibero-American MSMEs' performance.	0,064	0,010	6,458	0,000	Accepted
H02b. Family ownership mitigated the effects on the pandemic on Ibero-American MSMEs performance.	-0,036**	0,021	1,674	0,094	Rejected
H03: The COVID-19 pandemic led MSMEs in Ibero-America to actively engage in innovation.	0,111	0,013	8,368	0,000	Accepted
H04: Innovation positively mediated the relationship between the impact of the pandemic on MSMEs in Ibero-America and their overall performance.	0,163	0,010	15,800	0,000	Accepted

*Note: * relationship is negative and highly significant. The negative relationship indicates that as the impact of the pandemic increases, the performance of MSMEs decreases.*
*** the negative loading suggests that when firms are family-owned, there is a tendency for slightly lower performance.*
Source: research database (2021).

6. Discussion

Smaller businesses were the most affected group of businesses worldwide during the COVID-19 pandemic, especially in developing countries (Gunawan et al., 2022). Our

finding that the crisis had a profound negative impact on the performance of Ibero-American MSMEs is, therefore, unsurprising. Similarly, existing literature anticipated that larger firms would be better equipped to withstand the pandemic, which our results also confirm.

Less obvious were our findings that family-owned firms were more adversely affected by the pandemic than their nonfamily counterparts, despite much of the existing evidence suggesting otherwise (e.g., Miroshnychenko et al., 2023). This outcome may stem from the fact that family businesses tend to display heightened conservatism, risk aversion, and resource constraints (Heider et al., 2022). Given the pandemic's demand for swift and radical actions across businesses, many family-owned MSMEs may have lacked the transformative approach necessary to respond effectively respond to the sudden challenges brought on by the outbreak. Other characteristics common to these firms, such as a strong emotional attachment to non-economic goals and a family-centered business culture (Valenza et al., 2021), may also help explain the heightened challenges they faced during the pandemic.

Our second key finding shows that the pandemic triggered the adoption of innovation among Ibero-American MSMEs, corroborating previous investigations that had shown that innovation was a response of many SMEs to the COVID-19 led-crisis (Sharma et al., 2023). However, most of the studies on SMEs in the pandemic's context were conducted in developed countries and seemed not to have included micro-businesses, which are, by far, the most ubiquitous firm size in Ibero-America. Moreover, our research analyzes the mediating role of innovation practices, showing how they can translate deeply disruptive external shocks into the performance of MSMEs. We went beyond the bulk of studies on

the topic, which seem to focus either on digitization or individual innovation practices launched as countermeasures to the crisis. Our results show that the firms were able to engage in multiple innovation practices, despite the extremely challenging institutional conditions offered by Ibero-American countries and the common resource scarceness of local MSMEs (Rauch & Freese, 2000; Love & Roper, 2015). The innovation practices included improving current or creating new products, processes and business models and launching novel sales practices and strategies.

Third, we found that these innovation practices mitigated the destructive impact of the crisis on MSMEs. While innovation usually takes time to bear fruit (Rosenbusch et al., 2011; Triguero et al., 2014), we observed that MSMEs adapted swiftly to the unexpected and extremely harsh conditions encountered after March 11, 2020, the day marking the official beginning of the COVID-19 pandemic by the World Health Organization.

Our study answers the call for studies on how SMEs cope with the challenges encountered in developing countries (Luo, 2019) and expands the still small body of knowledge about how MSMEs in such regions can countervail extreme crises. Our findings offer two main contributions.

By employing a large sample of firms located in Spain and mostly Latin America, we empirically demonstrate that innovation amongst MSMEs from deeply disrupted developing countries is feasible and beneficial even under extreme circumstances. This is an encouragement for these business owners and managers to actively pursue improvements and create new processes, products, business models, and sales operations and strategies. In this sense, fostering a culture of innovation seems particularly beneficial, as it has proven to have a more substantial positive effect on the performance

of SMEs than focusing solely on outcomes like patents or new products (Rosenbusch et al., 2011). At the same time, MSMEs should work to develop the innovation capabilities intrinsic to the creation of successful transformation.

Second, our study reaffirms the importance of sound external supporting frameworks to help MSMEs become more innovative (Pedauga et al., 2021). Such structures should pay special attention to small family-owned firms, the type of business that is at the same time the most common in all countries and the most affected by the crisis. Nevertheless, this is a major challenge. Several reports showed that the governments of many emerging countries, including those in Latin America, failed to rescue small entrepreneurs, most of whom were left to their own devices. These nations' institutional, endemic shortcomings may suggest that meaningful changes in that respect, while certainly desirable, might still loom far on the horizon. Such a conclusion puts a heavier burden on the MSMEs' owners, as they have only external sources of support to improve their innovation capabilities.

6.1. Limitations

While our study renders relevant insights for theory and practice, we must also recognize some limitations. First, our sample includes only surviving firms. We had no access to MSMEs that went bankrupt during the COVID-19 pandemic and were unsuccessful in overcoming the challenges produced by the outbreak. Although we recognize that this characteristic of our sample may have biased the results, accessing firms that closed their doors is challenging in developing countries, and we could not accomplish it. Second, our sample includes MSMEs from only 14 out of 22 countries that compose the Ibero-American community. Despite this limitation, we are confident that the large sample size

collected in the researched countries allowed us to reach valid results for the MSMEs in the whole region. Third, our data do not indicate whether these firms received support from larger suppliers, partners, or governmental agencies. Such support may have contributed to reduce the negative impacts of the pandemic and help the sampled firms survive the worst period.

6.2. Suggestions for Future Research

Future studies can move forward and contribute to a deeper understanding of how innovation influences MSMEs' performance. For instance, researchers could analyze the long-term implications of innovations implemented by firms during the pandemic. Innovation helped the firms in our sample overcome the major challenges posed by the pandemic, but there is still no evidence of the effects these innovations produced for these firms over time. Future studies could also analyze how different support programs led by governmental agencies or private organizations helped MSMEs quickly and effectively implement innovations and how they supported these firms in overcoming the challenges produced by disruptions. Last, we suggest future studies consider the role of cooperation, interfirm agreements and networking in accelerating innovation, accessing new technologies and supporting MSMEs to improve performance.

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