Interplay of Customer Satisfaction, Innovation, and Product Quality: Key Determinants of Company Performance

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Abstract

Customer Satisfaction, Innovation, and Product Quality are a cornerstone for micro, small, and medium-sized enterprises (MSMEs) seeking growth, competitiveness, and long-term sustainability. This research explores the complexities of how Customer Satisfaction, Innovation, and Product Quality impact the performance of Micro, Small, and Medium Enterprises (MSMEs) within the vibrant Iberoamerican business environment. Utilizing a quantitative methodology, the study examines the interplay between Customer Satisfaction, Innovation, and Product Quality and their collective effect on the operational success of MSMEs in the Iberoamerican region. An index derived from self-reported data was employed to gauge MSME performance, drawing upon a comprehensive survey of 9,300 Iberoamerican MSMEs. Our findings reveal factors such as company origin, size, and age significantly impact the level of innovation achievable by MSMEs; also, innovation has generated resilience in some local sectors for one of the analyzed countries, Colombia. Notably, younger, medium-sized companies exhibit a propensity for higher innovation than older firms and micro-enterprises. The study's implications for theory and practice extend to policymakers, business owners, and stakeholders invested in fostering MSME growth and development.

Keywords: innovation; SME performance; innovation strategies; product innovation; research and development.

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1. Introduction

Micro, Small, and Medium-Sized Enterprises (MSMEs) are crucial engines of economic growth and innovation, especially in developing nations like Colombia, where they significantly contribute to employment, output, and market adaptability, thus playing a key role in wealth generation and distribution (ANIF, 2021; Cerda et al., 2023; World Bank, 2020). However, MSMEs encounter challenges that impair their capacity for innovation and competitiveness, including market openness, rapid technological changes, inadequate intellectual and human capital management, and infrastructural deficiencies (Ghag et al., 2022; Mishra & Singh, 2023).

Despite these obstacles, MSMEs' inherent flexibility presents an opportunity to gain competitive advantages in dynamic markets. Their agility and quick decision-making enable an innovative environment conducive to disruptive and incremental innovations, such as enhancements in production processes (Melendez & Dávila, 2022).

Adopting Open Innovation (OI) strategies, which involve amalgamating internal and external knowledge sources, can significantly boost MSMEs' innovation capabilities. Through efficient knowledge exploration and exploitation, MSMEs can discover unique competitive advantages, distinguishing themselves from larger firms (Rosenbusch et al., 2011).

This paper examines the innovation capabilities of Colombian MSMEs, drawing on a 2019 survey by FaedPyme, which covered 9,300 formal SMEs (FaedPyme, 2020). It explores SME managers' views on their firms' innovation capabilities and their impact on financial and non-financial performance.

Innovation capability is defined as an organization's proficiency in generating, developing, and commercializing new ideas, products, or processes that add value to the company and its stakeholders, emphasizing the significance of knowledge exploration and exploitation in creating innovative solutions (Lawson & Samson, 2001; Damanpour et al., 2009; Ibujés-Villacís & Franco-Crespo, 2022). Interactions among employees and the sharing of ideas are crucial for bolstering a firm's innovation capacity, as these actions facilitate the amalgamation of diverse perspectives and expertise, essential for generating and introducing novel ideas to the market (Marques, 2009). Research by You et al. (2022) highlights the importance of fostering an organizational climate that promotes innovative behaviors, enhancing employees' sense of belonging and psychological connection to the organization, thereby advocating for an environment that supports idea-sharing and interaction to stimulate innovation.

Moreover, Salam and Senin (2022) examine the motivations behind employees' engagement in innovative activities, finding that employees are highly motivated to participate in idea generation and implementation. This underscores the importance of creating an organizational culture that encourages idea exchange and communication and actively engages employees in the innovation process.

In conclusion, innovation capabilities are integral to various organizational practices and competencies that empower firms to innovate effectively and maintain competitiveness. This study aims to explore the perceptions and utilization of innovation capabilities by Colombian MSMEs to foster success, structuring the discussion from an introductory overview through a detailed literature review, methodological exploration, empirical analysis, result discussion, and culminating in a comprehensive conclusion.

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2. Literature review

2.1Innovation: A Cornerstone of Economic Progress and SME Performance

Innovation is crucial for firm success in the dynamic business environment. Strychalska-Rudzewicz and Rudzewicz (2021) emphasize its importance, with empirical evidence showing a positive correlation between innovation and firm performance, particularly product innovation (Elfita & Agustina, 2021; Ayinaddis, 2023). The integration of digital technologies also enhances innovation performance (Chawla et al., 2021), supported by factors like knowledge management and strategic HRM (Yang et al., 2022). Technological innovation is recognized for driving growth and financial performance (Fatema & Islam, 2021). However, the impact of different types of innovation varies, with product innovation having a more significant effect than process innovation (Ayinaddis, 2023).

Knowledge exchange and participation in global value chains are critical for spreading innovation, particularly in developing nations (Pietrobelli & Rabellotti, 2011). Innovation has historically been foundational to economic growth (Solow, 1998; Petrakos et al., 2005; Chu, 2018). In SMEs, strategic innovation significantly enhances performance (O'Cass & Sok, 2014; Ji et al., 2022), although they face challenges due to resource limitations (Castillo-Vergara & Lema, 2020). The return on innovation investment is not always proportional (Durán et al., 2016; Frank et al., 2021).

Product innovation is especially critical in emerging markets (Hanifah et al., 2021; Quan et al., 2019). Frugal innovation, achieving more with less, allows firms to devise solutions within budget constraints, which benefits both emerging and developed economies (Santos et al., 2020).

2.2 Importance of Adaptability

The COVID-19 pandemic has highlighted the necessity of adaptability and resilience for SMEs. Studies emphasize the importance of synergy and collaboration (Liza & Lutfi, 2023), financial constraints, and the need for digital transformation (Hidayat et al., 2023). Flexibility, redundancy, and collaboration are crucial for risk mitigation (Mohezar et al., 2023).

The pandemic has fostered digital inclusion and revealed digital divides (Nani & Maguraushe, 2022). Social capital has been vital in supporting SME performance during challenging times (Darmi et al., 2022). Despite adversities, opportunities for growth and strategic transformation have emerged (Zutshi et al., 2021). The crisis disrupted global value chains, necessitating adaptive shifts in business models (Liu et al., 2020). Leadership and collaboration are essential for enhancing adaptability (Saputra et al., 2022). Firms with dynamic capabilities in technology and relationships can adjust to changing contexts (Salisu & Bakar, 2019).

2.3 Innovation in Production and Product Offering

Product-centric innovation, which integrates digital and physical components, is critical to developing advanced products with compelling value propositions (Sharma & Sagar, 2023; She & Li, 2022). External knowledge, such as competitor intelligence, enhances product innovation (Lin et al., 2022). The trend toward customer-centricity in sectors like fast food and insurance fosters satisfaction and loyalty (Khashan et al., 2023; Iddris et al., 2022).

Eco-centric innovation aligns with circular economies, emphasizing sustainability (Sahasranamam & Soundararajan, 2021; Dagilienė, 2023). Customer-centric innovation creates immediate value for customers and firms (Shah et al., 2006; Arts et al., 2011). Service innovation can also drive value creation (Lindhult et al., 2018). User-driven and open collaborative innovation can lead to market success (Baldwin & Hippel, 2011).

These studies support the notion that companies engaging in innovative practices, especially in production processes and product introduction, tend to experience heightened growth and profitability. Innovation facilitates market share expansion and competitive protection and enhances overall performance. Nevertheless, companies must pursue innovation strategically, prioritizing the quality and relevance of their innovations to maximize success.

2.4 Organizational and Management Changes Impact

Organizational and management structures significantly impact company performance. Effective structures and management practices improve performance (Imran et al., 2021). However, the impact varies by context. For instance, Han et al. (2022) found that organizational structure changes did not significantly affect investment firm performance. ERP implementation during the COVID-19 pandemic improved efficiency and effectiveness (Djiantoro & Tarigan, 2022).

Green organizational culture and innovation enhance performance (Imran et al., 2021). Decentralizing decision-making and establishing cross-functional teams can improve outcomes (Chen & Huang, 2009). Management innovation responds to structural needs but may not markedly affect overall performance (Han & Gao, 2019). Innovations in production and product offerings tend to have a more pronounced effect on performance than organizational changes (Triyonowati et al., 2023). Colombia is characterized by a diverse cultural community, with touristic services, restaurants, and liquor microbusinesses, but this was also an affected economic sector (Harris, 2020).

2.5 Product Quality as a Key Differentiator

Product quality is crucial for market performance. High-quality products enhance market success and profitability (Sethi, 2000; Henard & Szymanski, 2001). Quality influences market size and consumer preference (Berry & Waldfogel, 2010). Accurate market information boosts competitive advantage (Dąbrowski, 2018). Institutional quality and adherence to quality standards improve firm performance and export success (Bhattacharya et al., 2021; Sun et al., 2021).

Sun et al. (2021) examine the relationship between quality and the competitiveness of the target market, highlighting the necessity of high-quality products for successful integration into global value chains.

Hypotheses

- Hypothesis 1: There is a strong positive relationship between customer satisfaction, speed of sales growth, profitability, and employee satisfaction.

- Hypothesis 2: Companies that innovate in their production processes and introduce new products/services to the market will likely see higher growth and profitability.

- Hypothesis 3: Changes or improvements in organizational and management structures have a lower impact on company performance than production innovations and product launches.

- Hypothesis 4: The quality of a company's products is a primary determinant of its market performance and is more influential than the efficiency of its production processes.

These hypotheses propose a framework in which customer satisfaction, profitability, innovation, organizational and management changes, and product quality are interconnected constructs. The suggested relationships clarify the mechanisms by which firms can enhance performance by focusing on critical factors such as customer satisfaction, innovation, organizational changes, and product quality.

3. Methodology

We employed a mixed methodology with an analytical approach based on three methods: the first is the AHP method with experts, the second is a statistical multivariate model: Confirmatory Factor Analysis (CFA), then a regression model based on an Ibero-American companies' sample, and the third is another sample in a Colombian region to answer the investigation questions.

3.1 Sample structure

The FaedPyme survey was an electronic format sent to many companies from 14 countries in Ibero-America (see Table 2 to verify the countries). The researchers employed a stratified sample. Owing to imprecise and fragmented public data, non-finite population sampling determines the sample size. Industrial sector (manufacturing, construction, trade, and services), company size (5 to 10 employees, 11 to 50 people, 51 to 200 employees). 9,300 SMEs were sampled with a 4.9 sampling error and 95% confidence. In Colombia, five regions were selected in the sample, but also, a representative percentage was also chosen for every size of the company. That is, the percentage of micro companies is 45.8%, small 23,3%, and Medium 13%. Table 1 and Table 2 indicate strata sampling error.

Table 1: Sample distribution and measurement error

Size		Frequency	Percentage	Percentage Valid	Percentage % accumulated
Valid	Micro	4261	45,8	55,8	55,8
	Small	2163	23,3	28,3	84,1
	Medium	1210	13,0	15,9	100,0
	Total	7634	82,1	100,0	
Lost	System	1666	17,9		
Total		9300	100,0		

Source: Own elaboration with data from the survey.

Table 2: Sample distribution by country

Country		Frequency	Percentage	Percentage Valid	Percentage % accumulated
Valid	Argentina	553	5,9	5,9	5,9
	Brazil	786	8,5	8,5	14,4
	Chile	303	3,3	3,3	17,7
	Colombia	1342	14,4	14,4	32,1
	Costa Rica	422	4,5	4,5	36,6
	Ecuador	1111	11,9	11,9	48,6
	El Salvador	267	2,9	2,9	51,4
	Spain	1550	16,7	16,7	68,1
	Guatemala	48	,5	,5	68,6
	Honduras	195	2,1	2,1	70,7
	Mexico	1704	18,3	18,3	89,0
	Panama	430	4,6	4,6	93,7
	Paraguay	367	3,9	3,9	97,6
	Uruguay	222	2,4	2,4	100,0
	Total	9300	100,0	100,0	

Source: Own elaboration with data from the survey.

3.2 Methods

Phase 1: To determine the company's innovation strategies, a multi-criteria analysis is elaborated using the AHP matrix of Saaty (2008) to determine the weights of the explanatory variables of the innovation. But here, an expert perception was considered to find appropriate weights; every expert was asked to give an opinion about the importance (using a scale of 9 points) of one variable related to another, providing a qualification used to determine the percentage weight that every variable has to apply it by multiplication to the value of the variable, that will give the corresponding component in the sum, that is the degree of innovation calculated according to the application of Equation (1). Thus, ratings on the innovation variables were given by a set of 10 business experts with at least five years of business experience and prior knowledge of applied innovation. Judgments were collected face-to-face through workshops. The reliability of the experts' judgments was validated by calculating the Consistency Ratio implicit in applying the AHP model. This index considers that the degree of consistency of the experts is acceptable if it does not exceed the value of 0.1, as proposed by Saaty (2008). Thus, SMEs that strongly agree with each statement are competitive performers. The literature uses subjective company performance assessments to overcome managers' reluctance to disclose business information (Rosenbusch et al., 2011).

$$Innovation = \sum_{i=1}^{15} Weight_i * X_i \quad (1)$$

Explanation Equation (1): 1) Innovation: This is the final value or score formula 1 calculates. It represents a measure of innovation for a given set of factors; 2) $\sum_{i=1}^{15}$: This is the summation notation. It means that you're going to add up a series of values. The i=1 indicates that you start with the first value, and the 15 on top indicates that you end with the 15th value. In this context, it suggests that there are 15 factors (or indicators) being considered: 3) $Weight_i$: : This represents the weight or importance of the (ith) factor. Weights are used to give different levels of importance to different factors. For example, if one factor is twice as important as another, its weight might be twice as l significant 4) X_i: This is the score or value of the ith factor for a given SME. It could represent how well the SME performs or how much they invest in that factor. So, in simpler terms, the formula calculates the innovation score by summing up the weighted scores of all 15 factors. This approach ensures that each factor contributes to the final score in proportion to its importance (as determined by its weight).

Phase 2: A descriptive analysis of general Confirmatory Factor Analysis characteristics and innovation profiles, with measures of CFA performance.

Phase 3: Regression model with factors related to innovation levels. It explains the association significance among covariables and innovation factors from CFA.

Phase 4: Finally, a regression model is estimated as an alternative tool to determine the impact of SME innovation profiles on their performance.

4. Results

4.1 Determinants of innovation

After applying the AHP model, the innovation variables' general, local, and global weights were obtained, as shown in Tables 3 and 4.
Categories of Innovation Strategies:

- Adaptability (46.91% of total weight) is the most prioritized innovation category. This emphasizes the importance of an organization's ability to be flexible and adapt to changes in the business environment.

- Product Innovation (31.54%) is the second most prioritized category, highlighting the significance of introducing new products/services or improving existing ones for business growth.

- Process Innovation (12.32%) and Management Innovation (9.23%) have lesser weights than the first two categories but are still essential components of an innovative business strategy.

Top Factors of Innovation (based on Global Weights):
The most critical factor is the market launch of new products/services (17.62%). This suggests that bringing new products to the market is seen as the most direct way of achieving innovation-driven growth.

The following significant factors are changes or improvements to existing products/services (13.93%) and the Quality of your products (12.15%). Maintaining high quality and regularly updating products/services are critical for business success.

- Factors like Speed of adaptation to changes in the market (7.68%) and Acquisition of new capital goods (6.88%) also hold considerable importance, indicating the value of agility in business and the need for investing in new technologies and equipment.

Factors with Lower Weights:
- Employee Satisfaction (2.36%) and Degree of absenteeism (1.84%) have the lowest weights. While these are essential aspects for any business, they are less directly tied to innovation than the other factors.

Table 3: Categories and Factors ask to managers to classify innovation.

Category		Factors	Local	Global
Adaptability	46,91%	[Quality of your products]	25,90%	12,15%
		[Efficiency of production processes]	10,89%	5,11%
		[Customer Satisfaction]	13,22%	6,20%
		[Speed of adaptation to changes in the market]	16,37%	7,68%
		[Speed of Sales Growth]	12,51%	5,87%
		[Profitability]	12,16%	5,70%
		[Employee Satisfaction]	5,03%	2,36%
		[Degree of absenteeism]	3,92%	1,84%
Product Innovation	31,54%	[Changes or improvements to existing products/services]	44,15%	13,93%
		[Market launch of new products/services]	55,85%	17,62%
Process Innovation	12,32%	[Changes or improvements in production processes]	44,15%	5,44%
		[Acquisition of new capital goods]	55,85%	6,88%
Management Innovation	9,23%	[New changes or improvements in organization and/or management]	30,76%	2,84%
		[New changes or improvements in purchases and/or supplies]	35,98%	3,32%
		[New changes or improvements in commercial and/or sales]	33,27%	3,07%

Source: Own elaboration.

Table 4: Innovation indicators.

Factor	Weight	Variable
Market launch of new products/services	17,62%	X_1
Changes or improvements to existing products/services	13,93%	X_2
Quality of your products	12,15%	X_3
Speed of adaptation to changes in the market	7,68%	X_4
Acquisition of new capital goods	6,88%	X_5
Customer Satisfaction	6,20%	X_6
Speed of Sales Growth	5,87%	X_7
Profitability	5,70%	X_8
Changes or improvements in production processes	5,44%	X_9
Efficiency of production processes	5,11%	X_{10}
New changes or improvements in purchases and/or supplies	3,32%	X_{11}
New changes or improvements in commercial and/or sales	3,07%	X_{12}
New changes or improvements in organization and/or management	2,84%	X_{13}
Employee Satisfaction	2,36%	X_{14}
Degree of absenteeism	1,84%	X_{15}
	100,00%	

Source: Own elaboration.

4.2 Confirmatory Factor Analysis

Confirmatory Factor Analysis finds the factors used for the Regression model, with latent variables or factors as the responses. Here, observable variables were the values weighted previously by the AHP results. This leads to finding every innovation indicator to find factors in the CFA technique.

The innovation indicators calculated after applying the AHP weights (Table 4), used for the estimation of the CFA, permitted to reduce the dimensionality of the 15 variables mentioned in the AHP weighting process is reduced to three factors. The estimations shown in Table 5 allow observing how the fit indicators are above 88%, especially the percentage of explanation of the set, Comparative Fit Index (CFI) is 90.8%, as well as the relative non-centrality index (RNI), in addition, the Goodness of Fit Index (GFI) of 96.1%, reflecting an excellent explanatory consistency in the variability of the innovation indicators, by the estimation of the three factors. In addition, the RMSEA value is 0.115, and the SRMR is 0.041, low levels of a quadratic error.

Table 5: Indices to Confirmatory Factor Analysis.

Index	Value
Comparative Fit Index (CFI)	0,908
Tucker-Lewis Index (TLI)	0,881
Bentler-Bonett Non-normed Fit Index (NNFI)	0,881
Bentler-Bonett Normed Fit Index (NFI)	0,907
Parsimony Normed Fit Index (PNFI)	0,701
Bollen's Relative Fit Index (RFI)	0,88
Bollen's Incremental Fit Index (IFI)	0,908
Relative Noncentrality Index (RNI)	0,908
Other fit measures	
Metric	Value
Root mean square error of approximation (RMSEA)	0,115
RMSEA 90% CI lower bound	0,113
RMSEA 90% CI upper bound	0,118
RMSEA p-value	0
Standardized root mean square residual (SRMR)	0,041
Goodness of fit index (GFI)	0,961

Source: Own elaboration.

Table 6 shows the Confirmatory Factor Analysis, describing the estimated weights for the factors that allow differentiation between them, according to the estimation effect of each innovation indicator, related to its significance as expressed in the second column. The last column shows the indicator's main contribution to each factor. For example, Factor 1 shows a high relevance of customer satisfaction, sales growth, and profitability. Factor 2 shows the relevance of innovation in production, products, services, and existing processes. Finally, Factor 3 shows the importance of product quality. All these factors are aligned concerning innovation for profitability improvement.

Table 6: Weights for factors of Confirmatory Factor Analysis.

Factor	Indicator Description	Estimate	St. Error	z-value	p	95% Confidence Interval		The main contribution of each factor
						Lower	Upper	
Factor Innova 1	Customer Satisfaction	0,056	0,000964	57,852	<,001	0,054	0,058	Clients' satisfaction and sales growth also related to adaptability
	Speed of Sales Growth	0,056	0,000666	83,406	<,001	0,054	0,057	
	Profitability	0,052	0,000634	82,689	<,001	0,051	0,054	
	Employee Satisfaction	0,023	0,000302	75,499	<,001	0,022	0,023	
Factor Innova 2	Changes in production processes	0,218	0,002000	128,324	<,001	0,215	0,221	Innovation related to production, new launch products but also, existing products, services, improvements
	New changes or improvements in management	0,043	0,000365	116,799	<,001	0,042	0,043	
	New changes or improvements in commercial and sales	0,044	0,000408	107,818	<,001	0,043	0,045	
	New changes or improvements in purchases and/or supplies	0,051	0,000409	125,158	<,001	0,05	0,052	
	Changes to existing products/ services.	0,212	0,002000	115,399	<,001	0,209	0,216	
	Market launch of new products/services.	0,268	0,002000	111,439	<,001	0,264	0,273	
Factor Innova 3	Quality of your products	0,116	0,002000	67,748	<,001	0,113	0,119	Product quality becomes important.
	Efficiency of production processes	0,051	0,000655	77,543	<,001	0,05	0,052	

Source: Own elaboration.

According to the Table 7 of analysis of covariance of the three estimated factors, significant and positive values can be seen for all the estimates, suggesting directly proportional associations in this regard. In this sense, the greatest contribution is established by the association between Factor 1 and Factor 3 since it is possible to visualize the incidence of 0.868, which, when contextualized, refers that product quality exerts a relative increase in customer satisfaction, sales growth, and perceived profitability. Factors 1 and 2 refer to the fact that the greater incidence of innovation in products, services, and processes is also reflected in greater customer satisfaction, sales, and profitability. Likewise, greater innovation shows the better quality of products or services.

- Factor 3 emphasizes the importance of product quality, given its higher estimated value compared to the efficiency of production processes. This could indicate that consumers prioritize product quality over other Factors.

- Factor 1 shows that customer satisfaction, speed of sales growth, and adaptability all have very similar estimate values. Moreover, the p-values for each of these indicators are less than 0.001, suggesting that these indicators are statistically significant. As employee satisfaction has a positive estimate, it may be influencing or being influenced by the aforementioned indicators.

- Factor 2, high estimation is associated with changes in production processes and the market launch of new products/services. This suggests that these activities might play a pivotal role in a company's success. Also, the new products launch and changes to the existents also a key in the observable components.

Table 7: Covariance Analysis.

Factor Covariances			Estimate	Std. Error	z-value	P	95% Confidence Interval	
							Lower	Upper
Factor Innova 1	↔	Factor Innova 2	0,447	0,01	44,168	< ,001	0,427	0,467
Factor Innova 1	↔	Factor Innova 3	0,868	0,007	128,1	< ,001	0,855	0,881
Factor Innova 2	↔	Factor Innova 3	0,458	0,01	45,194	< ,001	0,438	0,478

Source: Own elaboration.

4.3 Effects of regression models with explanatory variables

Analysis of the effects of explanatory variables in regression models provides important insight into the role of geographic location, age, and firm size in levels of innovation. Three model estimates were carried out using explanatory variables: country of origin, company size and company age. The response variables that were evaluated were the previously estimated innovation factors:

INNOVA1: Clients' satisfaction and sales growth, also related to adaptability.

INNOVA2: Innovation related to production, but also, new products launch and existing products, services improvements.

INNOVA3: The most important meaning in this factor is the product quality.

In the Table 8, the estimated effects of each explanatory variable are presented, offering valuable information on how each contributes to innovation levels. Thus, all variables, including country, age, and company size, were found to be significant in all three innovation factors. It was interesting that positive effects were observed in the levels of innovation (INNOVA1) for companies located in Brazil, Chile, Colombia, Costa Rica, El Salvador, Spain, and Mexico. However, for the second innovation indicator (INNOVA2), only Spain showed a negative effect, which can be interpreted as a decrease in innovation relative to the average value. For the third innovation indicator (INNOVA3), all countries showed positive effects. It is notable that Costa Rica, Guatemala, and Mexico stand out as leaders in this regard. Regarding the size and age of the companies, the results showed that microenterprises and more mature companies have lower contributions to innovation compared to medium and young companies. Small businesses, on the other hand, were shown to have better levels of innovation indicators 1 and 3. These findings suggest that geographic location, age, and company size may play critical roles in determining innovation levels in firms.

Complementing the findings obtained for each indicator regarding the variables of the country, age, and size of the company, the INNOVA1 indicator estimated coefficients indicate that companies in Costa Rica (0.0252441) and Mexico (0.0189921) have the greatest positive effects. Ecuador, on the other hand, showed a negligible negative effect (-0.0007553) and Uruguay showed a more marked negative effect (-0.0121344). Older companies and microenterprises show a decline in innovation, with coefficients of -0.0045088 and -0.0109936, respectively.

On the other hand, results of INNOVA2 shows that Costa Rica and El Salvador have the greatest positive effects, with coefficients of 0.109337 and 0.119266, respectively. However, Spain showed a negative effect (-0.075617), which is consistent with the previous analysis. As in the first factor, older firms and micro-enterprises are associated with lower levels of innovation.

Finally, for INNOVA3, companies in Costa Rica and Guatemala have the greatest positive effects, with coefficients of 0.052936 and 0.0468179, respectively. However, Uruguay showed a negative effect (-0.0131857). Older firms and micro-enterprises, again, are associated with lower levels of innovation.

Table 8: Estimated effects of each explanatory variable.

Response variable:	**INNOVA1**	**INNOVA2**	**INNOVA3**
Coefficients:	Estimate	Estimate	Estimate
(Intercept)	0,0043158	0,0404	0,0043002
country [T. Brazil]	0,0123988	0,041628	0,0235247
country [T. Chile]	0,0152081	0,096264	0,0301321
country [T. Colombia]	0,0058145	0,036532	0,018827
country [T. Costa Rica]	0,0252441	0,109337	0,052936
country [T. Ecuador]	-0,0007553	0,05216	0,0009415
country [T. El Salvador]	0,0120981	0,119266	0,035132
country [T. Espana]	0,0145313	-0,075617	0,0230298
country [T. Guatemala]	0,0158691	0,114921	0,0468179
country [T. Honduras]	-0,0016622	0,069284	0,0075087
country [T. Mexico]	0,0189921	0,081046	0,034292
country [T. Panama]	-0,0060116	0,010903	0,0046076
country [T. Paraguay]	-0,0005859	0,030728	0,0070322
country [T. Uruguay]	-0,0121344	0,003856	-0,0131857
factor(age) [T. older]	-0,0045088	-0,032536	-0,0055808
size [T. Micro]	-0,0109936	-0,062141	-0,0187497
size [T. small]	-0,0055394	-0,050237	-0,0120334

Source: Own elaboration.

4.4 Survey method

A survey instrument was applied, with a stratified random sampling, designed electronically, but completed by entering responses from the cell phone, with the possibility of interviewing business-people presential or by telephone. After using an equation to calculate the sample size, where the confidence level is 95%, the Z value related is 1.96%, n is the sample size to be obtained, with N = 750 bars, in a Colombian locality. Also, assuming e = 0.07, the sample quantity corresponds to approximately 156 but 158 surveys were obtained. The surveys were collected between January and July 2023.

Results: the profitability in commercial business was good before pandemic period, a 53.2% had a Good financial efficiency, besides, 29.5% were stable. During pandemic, a 47% had regular profitability, and 85.3% had no government help, which lead them to get debts promoting innovation. In this way, the COVID-19 pandemic significantly affected the sector of bars, nightclubs, and liquor stores. Some of them closed or made modifications in all work operations and executions of biosafety protocols. After the survey data collected, as it is shown in Table 9, we observed that post-pandemic profitability has improved significantly and returned to normal, with 18.35% of bars, followed by 12.66% of nightclubs and a 15.19% of the liquor stores that have presented high profitability, conducting their activities again.

Table 9: Profitability after COVID-19.

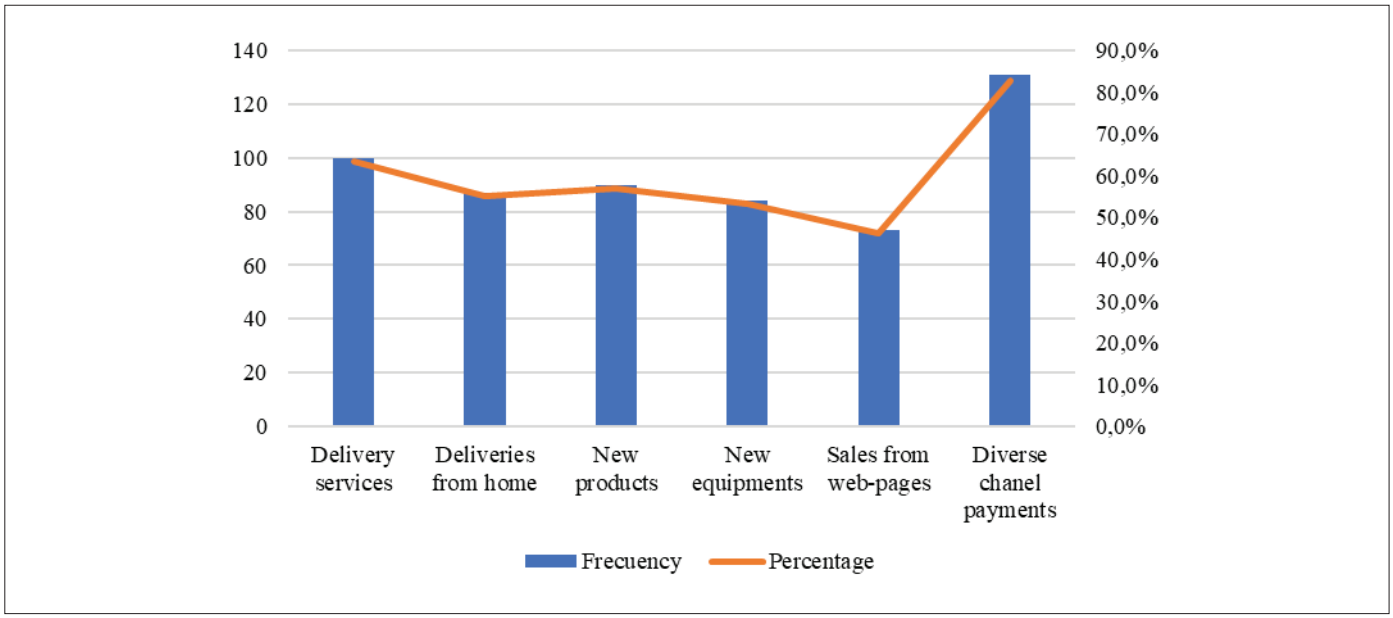
Business Type	**High profitability (> 100%)**	**Good profitability (51%-100%)**	**Low (< 0%)**	**Median (0-50%)**	**Total**
Bar	18.35	13.29	2.53	5.70	39.87
Nightclubs	12.66	8.86	0.00	2.53	24.05
Bar and restaurant	1.90	2.53	0.00	0.00	4.43
Coffee	0.00	0.00	0.00	0.63	0.63
Coffee and bar	0.63	3.80	0.00	0.63	5.06
Slushies	0.00	0.63	0.00	4.43	5.06
Only Liquor	15.19	1.90	0.00	3.80	20.89
Total	**48.73**	**31.01**	**2.53**	**17.72**	**100**

Source: Own elaboration.

This improvement was also reached because of innovations implemented, as delivery services from home, virtual channel sales of fast food, with biosecurity elements, among others. Above actions contributed to resilience and subsistence during the COVID-19 pandemic. In total, 46 companies out of 158 surveyed (29%), created different business models, but also, many of them implemented innovation in one of the services exposed in Figure 1.

In Figure 1 we can see that most of the companies changed their original business and implemented multichannel or online sales in more than 46%, also, diverse type of payments, more than 80%.

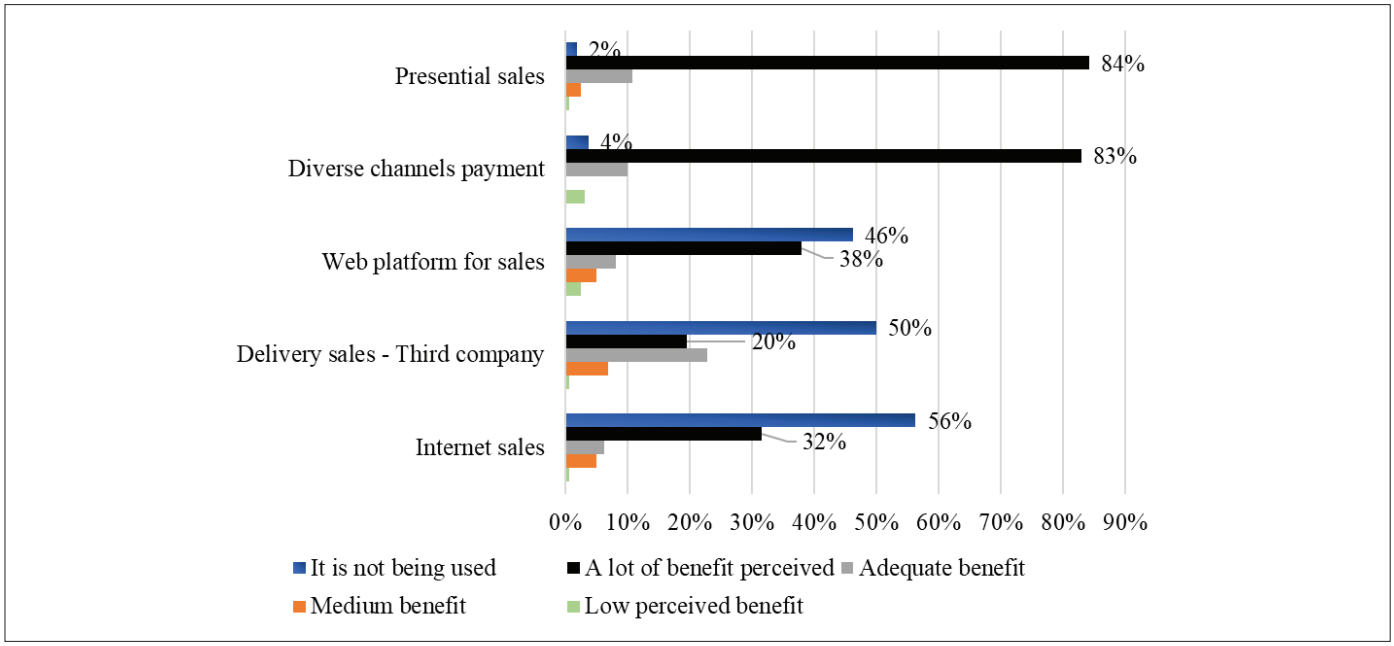
Figure 1. Innovation implemented.



Source: Own elaboration.

After pandemic, most of the companies have continued using the new services, but in lower levels for deliveries (Figure 2), while diverse channel payment has a high benefit perception (83%), but internet sales is reaching a close value to 40%, finding a lot of benefit, and 20% in deliveries.

Figure 2: Benefits Perception after pandemic COVID-19 (currently).



In this way we can appreciate the recovery in this sector, with the innovations, most of the business implemented multi-channel or online sales strategies, as well as various payment methods that showed a continue use, which currently showed high benefits perceived, since among 32% and 83% found improvement from the innovations implemented.

4.5 Discussion of the results

The adaptability of SMEs is crucial for their success and innovation. SMEs must adjust various aspects of their operations, such as product quality, production efficiency, and customer satisfaction, to stay competitive and meet changing market demands (Liu et al., 2020). However, developing adaptability can be challenging due to resource constraints (Chan et al., 2018).

The study highlights the importance of product-centric innovation in offering immediate benefits to consumers, thereby influencing revenue and sales. These findings underscore the significance of product-related innovations in creating customer value and generating revenue. Conversely, process and management innovations, though receiving less emphasis, remain indispensable. Investments in modern technologies and novel managerial tactics can yield long-term advantages. Factors like employee satisfaction and absenteeism, while crucial for overall well-being, may not be primary drivers of innovation. The innovation score for an SME can be deduced by correlating the weight of each facet with its respective score, serving as a benchmark for evaluating innovative capacity.

Conversely, even though process and management innovation categories are accorded lower emphasis in comparison to product innovation, they remain indispensable. Commitments towards procuring contemporary technologies and tools, and organizational tactics, can yield long-standing advantages. Employee satisfaction and absenteeism, despite being pivotal for a company's holistic well-being, may not be the most important factor; to drive innovation, a combination of technologies, resources, as well as competitive research are essential. This metric functions as a clear benchmark for evaluating the innovative capacity of an SME. In summary, although the primary focus for SMEs often lies on adaptability and product innovation, each category and aspect contribute distinctly to shaping a competitive and advanced business strategy. It is crucial to sustain a balance, ensuring that while priority areas are adequately addressed, peripheral dimensions are not neglected.

The results corroborate previous analyses, highlighting the importance of geographic location, age, and company size in innovation levels. Small companies perform better in innovation directed at quality improvements (INNOVA3) and sales growth (INNOVA1). Medium-sized companies excel in product and production improvements (INNOVA2), driven by competitiveness and new technologies (Hoque et al., 2021; Wijewardhana et al., 2021).

Technological innovation, particularly in manufacturing process efficiency, is heavily influenced by Technoware, with less impact from Humanware. This underscores the need for strengthening technological capabilities and adopting Industry 4.0 technologies in new product development (Wijewardhana et al., 2021). However, there is a lack of data on company technology and environment, indicating areas for further exploration such as radio frequency and virtual e-commerce technologies (Hoque et al., 2021).

The significant impact of company origin, size, and age aligns with recent research, suggesting these variables majorly affect firms' ability to innovate (Freire et al., 2020). Countries like Brazil, Chile, Colombia, Costa Rica, El Salvador, Mexico, and Spain exhibit high innovation levels, supported by policies and infrastructure that foster innovation. Medium-sized and young enterprises contribute more to innovation compared to micro and mature firms. Younger, mid-sized companies are often more agile and can adapt quickly to changes, facilitating innovation (Yeung & Ulrich, 2020; Feng et al., 2021; Perez, 2023). Small firms also outperform micro and mature firms in innovation, supported by their flexibility and agility (Rojas et al., 2021).

The results reinforce existing literature suggesting that the country of operation, age, and size of the firm are determining factors in innovation (Saviotti, 2022). Larger and newer companies tend to be more innovative due to their ability to absorb innovation costs and adapt quickly to changes. Geographical location also plays a crucial role in innovation, influenced by differences in innovation ecosystems between countries (Yun, 2022).

Hypotheses

1. Hypothesis 1: There is a strong positive relationship between customer satisfaction, speed of sales growth, profitability, and employee satisfaction. Prioritizing customer satisfaction leads to higher sales growth, increased profitability, and higher employee satisfaction (Burchett et al., 2023; Tannady & Alvita, 2023). Service quality and customer interactions enhance satisfaction and loyalty, impacting organizational success (Fasolo et al., 2024). Digital platforms and omnichannel approaches further influence customer satisfaction (Valencia et al., 2022). Corporate social responsibility, total quality management, and relationship marketing also play roles (Mohammadi et al., 2023).

2. Hypothesis 2: Companies that innovate in production processes and product offerings are more likely to achieve higher growth and profitability. While innovation is a catalyst for growth, its impact depends on context (Mansikkamäki, 2023). Market penetration and strategic alliances also boost firm performance (Lu, 2023).

3. Hypothesis 3: Changes in organizational and management structures have a lower impact on company performance than production innovations and product launches. Organizational changes aim to improve efficiency but are secondary to innovations in production and product development (Nugraha, 2023). Strategic entrepreneurship and organizational learning are crucial for enhancing performance (Wijaya, 2023).

4. Hypothesis 4: Product quality is a primary determinant of market performance and is more influential than production efficiency. Product quality influences consumer behavior and purchasing decisions, with technological advancements and product features playing critical roles (Widyarsih et al., 2023; Tannady & Alvita, 2023; Josan et al., 2023; Meliawati et al., 2023).

This integrated approach provides a comprehensive perspective on the factors contributing to business success in today's evolving market environment. The review of recent literature and the 158 surveys complement the 2019 survey findings, offering a nuanced understanding of the dynamics between customer satisfaction, innovation, organizational management, and product quality in determining firm performance.

5. Conclusions

The results of this study highlight several key points and implications. Adaptability is crucial for SMEs, enabling them to adjust to changes in product quality, production efficiency, and customer satisfaction. Although resource constraints pose challenges, leadership, collaborations, technological capability, relational capability, and dynamic capabilities can enhance adaptability. Effective management of organizational and individual knowledge is also essential for SMEs to navigate the business environment successfully. The COVID-19 pandemic has underscored the importance of adaptability, as SMEs had to modify their business models to cope with the evolving environment.

Improvements in production processes emerged as the most significant factor, explaining the highest component percentage of variance. This indicates that prioritizing production process enhancements can have the most substantial impact on profitability. Organizational and management improvements, along with optimized supply chain and procurement strategies, are also crucial. These areas should receive significant attention to drive profitability. Changes or improvements to existing products/services, market launches of new products/services, and acquisition of new capital goods, while important, have a lower impact compared to production process and organizational improvements. However, these factors still contribute to overall profitability and should not be overlooked.

Our study found that companies in Costa Rica, El Salvador, and Mexico are particularly innovative. Additionally, younger, medium-sized companies tend to be more innovative than older companies and micro-enterprises. These findings underscore the need to foster conducive conditions for innovation across different business contexts.

The study has several limitations. It relies on cross-sectional data, limiting our ability to infer causality. We only examined three innovation factors, whereas many other factors could influence innovation. Additionally, while significant differences between countries were identified, the underlying reasons for these differences were not explored. Despite these limitations, this paper provides empirical evidence of differences in innovation based on firm size, age, and geographic location. This can inform policymakers aiming to promote innovation. It is crucial to consider geographical location, age, and company size when designing innovation policies.

The findings are based on a specific subset of cases where company profitability was positively impacted in 2020 and may not be generalizable to other contexts. Further research is needed to validate these findings. Businesses should prioritize investments in production processes, organizational management, and procurement strategies to maximize profitability. However, it is important to consider the specific needs and goals of each business, as well as the broader economic and market conditions in which they operate.

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