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The impact of management on performance in micro and small enterprises; A systemic analysis

El impacto de la dirección en el desempeño en las micro y pequeñas empresas; un análisis sistémico

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Abstract

The aim of this article is to show which processes within micro and small enterprises (MSEs) have a greater impact on the perception of productivity, examined from a systemic analysis framework, where inputs, processes and outputs of the system exist. To perform the study, 48,068 MSEs were analyzed by means of an interview conducted to the person who makes most of the decisions in four Latin American countries (Mexico, Colombia, Peru and Ecuador). The data collected were analyzed using a linear regression model. The main contribution is the development of an equation that allows the identification of the factor that has the greatest impact on the perception of performance, resulting in the management of the activities which have the highest influence on a company's results.

JEL Code: M10, M19, M54
Keywords: systemic analysis; competitiveness; micro and small enterprises; management

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Resumen

El presente artículo tiene como propósito mostrar qué procesos dentro de las micro y pequeñas empresas (mypes) tienen un mayor impacto en la percepción de la productividad, examinados desde el esquema de análisis sistémico, donde existen los insumos, procesos y salidas del sistema. Para llevar a cabo el estudio, se analizaron 48 068 mypes mediante una entrevista hecha a la persona que toma gran parte de las decisiones en cuatro países de Latinoamérica (México, Colombia, Perú y Ecuador). Los datos recopilados se analizaron mediante el modelo de regresión lineal. El principal aporte es el desarrollo de una ecuación que permite identificar cuál es el factor de mayor impacto en la percepción del desempeño, dando como resultado las actividades de dirección, las cuales tienen mayor influencia en los resultados de la empresa.

Código JEL: M10, M19, M54
Palabras clave: análisis sistémico; competitividad; micro y pequeñas empresas; dirección

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Introduction

In recent years, different researchers have analyzed micro and small enterprises (Barbosa, Castañeda, & Lombardo, 2020; Mazzarol & Reboud, 2020b). It has become a complex topic due to their great diversity of activities since it is considered that they represent more than 90% of the business sector worldwide and generate more than 33% of the gross domestic product by employing more than 45% of the economically active population (Durán, 2017). The great challenge in the study of MSEs lies in the differences they present in the multiple lines of business in which they operate, which has led to a lack of knowledge regarding their operation.

The literature on MSEs shows fragmented knowledge gaps due to the limited number of models that provide self-assessment tools that can be applied to any enterprise since most models present weaknesses when seeking to standardize their results (Aydiner *et al.*, 2019). In the case of MSEs, research has addressed several aspects, from entrepreneurship motivation and their skills in terms of experience and training to the perception of desirable outcomes (Barba-Sánchez & Atienza-Sahuquillo, 2017; Tiwari, Bhat, & Tikoria, 2017), including the closure of enterprises that has been related to external factors such as the economy and financial factors (Everett & Watson, 1998; Peña, Aguilar & Posada, 2017; Urbano, Aparicio, & Audretsch, 2019).

Nevertheless, each researcher shows limited aspects in their studies because in their works the samples are small considering the diversity of lines of business and characteristics of the entrepreneurs (Rauch, Frese, & Utsch, 2005; Torres, 2005). This occurs due to the heterogeneity of the MSEs that does not facilitate analyzing and standardizing results at the company level—for example, financial performance, management, international business, and entrepreneurship (Dabić *et al.*, 2020)—due to the number of variables they consider, since the number of the sample leads to questioning whether the MSEs

analyzed have similar characteristics. It is crucial to study how MSEs manage their processes, in addition to finding their behavioral patterns, which makes it possible to determine which activity they attach more importance to and whether it is correlated with a greater impact on their perception of productivity from a systemic analysis (Aguilar & Peña, 2021; Peña, Posada, & Aguilar, 2019; Posada, Aguilar, & Peña, 2016).

Review of the literature

Micro and small enterprises (MSEs)

Understanding the life cycle of enterprises provides insight into the evolution and significance of the enterprise. Most researchers suggest that every enterprise has to start, then grow, while facing various challenges and crises, and finally mature and decline regardless of its legal form (Reid, 2020). Several countries have created mechanisms to segment enterprises using quantitative and qualitative variables, such as their income and number of workers in most cases. Micro and small enterprises are thus categorized with up to 50 workers, which present similar operating processes and structures (Posada *et al.*, 2016), although medium and large enterprises have similar structures. Process models help organizations visualize and optimize their activities and achieve their business objectives more efficiently. Modeling a business process requires accurate information about possible sequences of activities and knowledge of process modeling notation (Wiśniewski *et al.*, 2018). One of the ways to study enterprises' processes is through systemic analysis, where the interdependencies of input and output processes of the system can be observed (Aydiner *et al.*, 2019; Von Bertalanffy, 1976). This provides a structured decision-making technique that includes both qualitative and quantitative criteria (Taherdoost & Brard, 2019) for value creation or even for value destruction (Canhoto & Clear, 2020).

Systemic analysis

This research uses the process analysis schema through the following three aspects.

I. The inputs of the system make it possible to analyze: a) Human resources as one of the main aspects where there are multiple dimensions such as experience, skills, education, and training (Mubarik, Chandran, & Devadason, 2018), which are related to the productivity and success of the enterprise (Hirzel, 2017; Kayl et al., 2017; Rauch et al., 2005). One of the problems faced by the MSE is how to manage its personnel. It has not delved into specific forms for this type of enterprise (Núñez-Ríos,

Sánchez-García, & Tejeida-Padilla, 2020) and experiences difficulties in hiring qualified workers (Tambunan, 2019). b) Market analysis, where the management of a new product development process is reviewed, is a challenging task for enterprises to strengthen success, which is developed in two stages: pre-development activities, and product development and testing (Dang, McMurray, & Huang, 2021). In the upstream stages, knowledge about the market and consumers enables enterprises to generate a competitive advantage to survive in highly turbulent and rapidly changing markets (Nemati & Khajeheian, 2018; Verhees & Meulenberg, 2004). c) Suppliers, where it is analyzed how the new role of suppliers is not only to supply products; they have become key pieces in the improvement of organizations (Fallahpour et al., 2016; Haakonsson & Slepniov, 2018) due to the establishment and adaptation of standards that help increase value and performance through the relation between external and internal integrations (Shashi, Shabani, & Singh, 2019), which allows enterprises to prioritize economic and operational practices specific to their line of business (Malesios, Dey, & Abdelaziz, 2020).

II. The system processes allow the analysis of: a) Management as the importance of developing strategic thinking skills, along with the need to balance the strategy, structure, and resources of organizations. It is critical to achieve objectives (Mazzarol & Reboud, 2020a) through leadership and development of teams that can operate systems efficiently and effectively. It is one of the most critical elements in the long-term success of the enterprise (Mazzarol & Reboud, 2020b), providing strategic insights through the development of overriding goals and values, their implementation, and feedback (Grünig & Kühn, 2015; Verreynne & Meyer, 2010).

b) Finance, where it is observed how entrepreneurs of small enterprises seek to acquire more financial literacy as they tend to be responsible for all tasks related to business survival. The two most important aspects of financial literacy are the knowledge of how to obtain adequate capital to establish their business and an accurate calculation of costs (Rachapaettayakom et al., 2020). Furthermore, understanding the operation of the business in terms of knowledge of accounting, costs, and budgeting (Ali et al., 2018) is critical.

c) Production-operation analyzes the great challenges MSEs face, improving product quality and competitiveness (Harvie, 2019). It is important to continuously evaluate waiting times between production processes, defective products, inefficient working practices, plant layout distribution, workload balances, and standardization of working practices (León-Guizado et al., 2021). These help to improve competitiveness through d) innovation, which is analyzed as intrinsically risky by nature: the more radical and disruptive the innovation, the more uncertainty and potential risk it creates (León-Guizado et al., 2021). Innovation has several positive impacts as a means of change (Cucchiara et al., 2011) and a driver of commercial performance in the financial and operational dimensions (León-Guizado et al., 2021). Regarding commercial performance, e) marketing is analyzed through the marketing mix's

4P elements (product, price, place, and promotion). The creation of an offer is conceptualized as product, exchange as price, delivery as place distribution and, finally, communication as promotion; however, without a consumer who is willing and able to buy the product under the influence of these elements, all marketing efforts will be in vain (Kucuk, 2017). Understanding the market has generated value in enterprises through field research (Hult & Ketchen, 2017).

III. The outputs of the system analyze the impact made by the enterprise by analyzing the conscious use of resources, seeking balances in ecology and the environment, and respecting nature (Rath, Azhaguraja, & Deo, 2021). Customers are increasingly pressuring brands to adopt genuine corporate social responsibility practices and co-creation activities (Iglesias et al., 2020). Corporate social responsibility is part of the sustainability debate within organizations and as a result, several systems have emerged to manage this issue. ISO 26000 aims to help organizations contribute to sustainable development and employ international standards of behavior (Deus et al., 2019).

Hypotheses

For this paper, a central hypothesis and three specific hypotheses were considered.

General research hypothesis

System inputs (human resources, market analysis, suppliers), system processes (management, finance, production-operation, innovation, marketing), and system outputs (ISO 26000 principles, ISO 26000 issues) are factors that contribute to improving performance in micro and small enterprises (profits, sales, number of employees).

Specific hypotheses

H1: System inputs (human resources, market analysis, suppliers) are the factors that contribute most to improving performance in micro and small enterprises (profits, sales, number of employees).

H2: System processes (management, finance, production-operation, innovation, marketing) are the factors that contribute most to improving performance in micro and small enterprises (profits, sales, number of employees).

H3: System outputs (ISO 26000 principles, ISO 26000 issues) are the factors that contribute most to improving performance in micro and small enterprises (profits, sales, number of employees).

For the model proposed in Figure 1, the following variables were integrated: as the independent variable, the performance of the MSE enterprise (profits, sales, number of employees); and as dependent variables, system inputs (human resources, market analysis, suppliers), system processes (management, finance, production-operation, innovation, marketing) and system outputs (ISO 26000 principles, ISO 26000 issues).

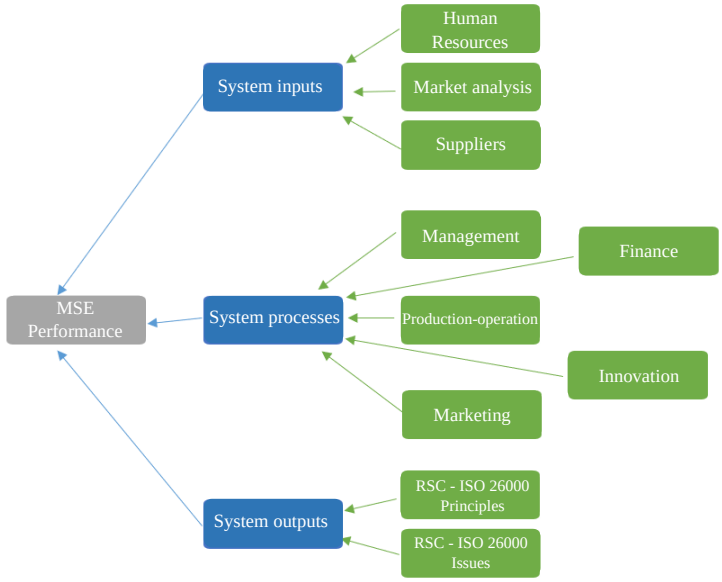

Figure 1. Proposed model

Methodology

The following research question was formulated: what factors contribute to improving performance in micro and small enterprises? and it was determined from the perspective of systemic analysis, understanding it as a process of inputs and outputs. For this purpose, a quantitative, non-exploratory causal cross-sectional study was conducted (Hernández-Sampieri & Mendoza, 2018). The instrument was designed to be answered on paper by the entrepreneur or manager of the enterprise (the person who makes most of the decisions in the enterprise), with the option for the interviewers to read it aloud and complete it according to the information provided by the interviewee. The pilot test was conducted in January 2020, and 832 surveys were administered in three regions. Subsequently, 16 022 surveyors participated, and the survey was conducted between February and May 2020 in four countries (Mexico, Colombia, Peru, and

Ecuador). 160 regions were surveyed, reaching a total sample of 48 068 MSEs. The surveyors were responsible for inputting the data on an Internet platform created specifically for this purpose. The research instrument for the systemic analysis was taken from previous research conducted by the Latin American Business and Management Studies Network (RELAYN; Spanish: Red de Estudios Latinoamericanos en Administración y Negocios) (Posada et al., 2016). The conceptual definitions of each of the variables are presented in Table 1. A five-point Likert scale was used regarding the instrument's operational definition.

Table 1
Conceptual and operational definition

Variable	Conceptual definition	Items
MSE performance (V1)	The entrepreneur's perception of the enterprise's performance as measured by sales, profits, and number of employees	3
System inputs (V2)	An enterprise requires suppliers, human resources, and market analysis to carry out its operations. These factors make it possible to ask about their contribution to the process.	
Human Resources (VR)	The employer's perception of having efficient and honest workers who are capable of performing work activities	12
Market analysis (VA)	The entrepreneur's perception of the methodology to know and evaluate its positioning, its products or services, as well as the competition	9
Suppliers (VP)	The entrepreneur's perception of the qualities that the enterprises or persons supplying the products or raw materials should have	6
System process (V3)	The development of enterprises derives from their capacity to produce and sell products or services through the proper management of their planning, finances, production, innovation, and marketing, where these factors make it possible to ask what contribution they make to the process.	
Management (VD)	The perception of the importance of establishing the mission and vision of carrying out strategic planning activities and monitoring objectives	8
Finance (VF)	The perception of the importance of developing financial plans for successful financial management	13
Production-operation (VO)	The entrepreneur's perception of distribution logistics activities and cost reduction by improving processes	5
Innovation (VI)	The entrepreneur's perception of the importance of developing products or services by adapting them to the markets	8
Marketing (VM)	The entrepreneur's perception of the development of the marketing mix in terms of product, place, price, and promotion	11
System outputs (V4)	The enterprise impacts its environment, taking care of the legal and ethical frameworks through its processes, workers, the community, and customers; these factors make it possible to ask what contribution they make to the process.	
RSC - ISO 26000 Principles (VPR)	The employer's perception in the application of standards and legislation to socially responsible behavior	8
RSC - ISO 26000 issues (VA)	The importance of the entrepreneur in activities that promote the welfare of the different stakeholders for a socially responsible development	6

Source: created by the author

Population and sample

The study was conducted among managers of micro and small enterprises (people who make most of the decisions in the enterprise), comprising 48 068 cases through a simple sampling system. The following are some characteristics of the enterprise managers: the most common age is 40 years old, 50% of them are married, and 50.8% are male. In terms of schooling, most of them have studied up to the third year of a baccalaureate, and most of the managers surveyed dedicate 54 hours per week to the enterprise. Micro enterprises (1 to 10 workers) represented 77.6% of the sample, small enterprises (11 to 50 workers) represented 22.3%, and the economic activity with the highest representation was retail sales in non-specialized stores.

Procedure

After the surveyors inputted the data on an Internet platform, these data were integrated into two statistical programs (PSPP and Jamovi 2.2.5) for analysis. The study started with a) the reliability of the sample by analyzing Cronbach's alpha and McDonald's omega to observe the instrument's consistency. Next, it proceeded with b) descriptive statistics to determine behavioral patterns by analyzing the mean and standard deviation of the variables. Finally, it continued with c) exploratory factor analysis to observe the underlying structure of the instrument using its dimensions.

In the results of the work, the study presented a) the correlation determining the relation among the variables and then b) a linear regression to measure the magnitude and effect of the dependent variables on the independent variable.

a) Reliability of the sample

A total of 48 068 cases were analyzed, of which 40 255 were validated, representing 83.75%, and 7 813 were excluded, representing 16.25%. The results are shown in Table 2. The instrument shows accepted reliability and validity.

Table 2
Reliability of the instrument

Variable	No. of items	Cronbach's alpha value	McDonald's omega value
System inputs	27	0.927	0.928
System processes	45	0.956	0.957
System outputs	14	0.940	0.942
Total	86	0.970	0.971

Source: created by the author

Once the reliability analysis was carried out utilizing two validity and reliability measures, a high reliability was observed in the three variables, showing internal consistency of the instrument through Cronbach's alpha analysis and the standardized factor load through McDonald's omega.

b) Statistical analysis

The statistical analysis was then performed to analyze each variable's means and standard deviation in Table 3. The highest score is presented in the system inputs (mean 3.88).

Table 3
Descriptive statistics

Valid cases = 48 068; cases with missing values = 221			
Variable	Qty.	Mean	Std. dev.
System inputs	47 971	3.88	0.66
System processes	47 971	3.74	0.66
System outputs	47 849	3.74	1.00

Source: created by the author

c) Exploratory factor analysis

A factor analysis was carried out to observe the underlying structure of the instrument using its dimensions. Three homogeneous groups corresponding to the study variables are distinguished. The items are correctly grouped according to the variables; it should be noted that three items (VD5, VD7, and VO5) present shared variances but are found within the corresponding factor for the following analyses, as shown in Table 4.

Table 4
Factor analysis

System outputs		System process			System inputs	
	Factor		Factor			Factor
	1		1	2		3
VPR1	0.612	VD1		0.346	VR1	0.866
VPR2	0.665	VD2		0.322	VR2	0.906
VPR3	0.595	VD3		0.413	VR3	0.9
VPR4	0.65	VD4		0.402	VR4	0.905
VPR5	0.561	VD5	0.337	0.378	VR5	0.882
VPR6	0.664	VD6		0.501	VR6	0.815
VPR7	0.548	VD7	0.308	0.378	VR7	0.731
VPR8	0.641	VD8		0.447	VR8	0.788
VA1	0.604	VF1		0.561	VR9	0.711
VA2	0.548	VF2		0.417	VR10	0.657
VA3	0.499	VF3		0.563	VR11	0.723
VA4	0.447	VF4		0.537	VR12	0.479
VA5	0.463	VF5		0.459	VA1	0.306
VA6	0.63	VF6		0.54	VA2	0.321
		VF7		0.536	VA3	0.323
		VF8		0.513	VA4	0.315
		VF9		0.654	VA5	0.384
		VF10		0.631	VA6	0.35
		VF11		0.758	VA7	0.307
		VF12		0.744	VA8	0.33
		VF13		0.671	VA9	0.348
		VO1		0.452	VP1	0.515
		VO2		0.391	VP2	0.608
		VO3		0.4	VP3	0.612
		VO4		0.376	VP4	0.4
		VO5	0.319	0.312	VP5	0.558
		VI1		0.507	VP6	0.32
		VI2		0.448		
		VI3		0.579		
		VI4		0.736		
		VI5		0.741		
		VI6		0.742		
		VI7		0.735		
		VI8		0.665		
		VM1		0.399		
		VM2		0.35		
		VM3		0.541		
		VM4		0.373		
		VM5		0.565		
		VM6		0.475		
		VM7		0.638		
		VM8		0.628		
		VM9		0.594		
		VM10		0.575		
		VM11		0.305		

Note: The minimum residue extraction method was combined with an Oblimin rotation.

Source: created by the author

Results

After verifying that the construct is valid and reliable, correlation and linear regression tests were carried out to answer the hypotheses. The general hypothesis was applied: system inputs (human resources, market analysis, suppliers), system processes (management, finance, production-operation, innovation, marketing), and system outputs (ISO 26000 principles, ISO 26000 issues) are factors that contribute to improving performance in micro and small enterprises (profits, sales, number of employees).

a) Correlation of variables

The statistical relation between the study variables is analyzed through Pearson's correlation, to analyze if there are correlations with the performance of the MSE.

Table 5
Correlation of variables

		MSE Performance	System inputs	System processes	System outputs
MSE Performance	Pearson's correlation	1.00	0.19	0.21	0.13
	Sign. (2-tailed)		0.000	0.000	0.000
	N	46 920	46 916	46 916	46 803
System inputs	Pearson's correlation	0.19	1.00	0.65	0.47
	Sign. (2-tailed)	0.000		0.000	0.000
	N	46 916	47 971	47 969	47 847
System processes	Pearson's correlation	0.21	0.65	1.00	0.59
	Sign. (2-tailed)	0.000	0.000		0.000
	N	46 916	47 969	47 971	47 849
System outputs	Pearson's correlation	0.13	0.47	0.59	1.00
	Sign. (2-tailed)	0.000	0.000	0.000	
	N	46 803	47 847	47 849	47 849

Source: created by the author

Table 5 shows that the variables have a weak positive linear correlation through an unstable linear rule (Ratner, 2009), which is significant since they are less than 0.005. It is concluded that inputs (0.19), processes (0.21), and system outputs (0.13) are related to MSEs' performance. The impact of each is then analyzed using linear regression.

b) Linear regression

The general hypothesis consists of determining whether system inputs (human resources, market analysis, suppliers), system processes (management, finance, production-operation, innovation, marketing), and system outputs (ISO 26000 principles, ISO 26000 issues) are factors that contribute to improving performance in micro and small enterprises (profits, sales, number of employees). The linear regression then begins, where performance (V_1) is the dependent variable, and the independent variables are system inputs (V_2), system processes (V_3), and system outputs (V_4). Next, the general formula of the linear regression and the results are shown, and the values are substituted to determine which one has the greatest impact.

$$y = \text{Constant} + V2x + V3x + V4x$$

Table 6
Linear regression of the systemic analysis

	Standardized numerical coefficients		Standardized coefficients		
	B	Standard error	Beta	t	Sign.
Constant	1.84	0.03	0.00	61.70	0.000
(V_2) System inputs	0.14	0.01	0.09	15.57	0.000
(V_3) System processes	0.25	0.01	0.16	24.69	0.000
(V_4) System outputs	–0.01	0.01	–0.01	–1.98	0.048

Source: created by the author

Both Table 6 and Figure 2 show the results of the linear regression, where it can be observed that V3 system processes have a greater impact on the performance of the MSE with 0.9350, and when the equation is solved as a whole, it has an impact of 3.2808 on the performance of the MSE. Similarly, the standardized coefficient shows that V3x (0.16) has a greater importance in the model than V2x (0.09) and V4x (-0.01).

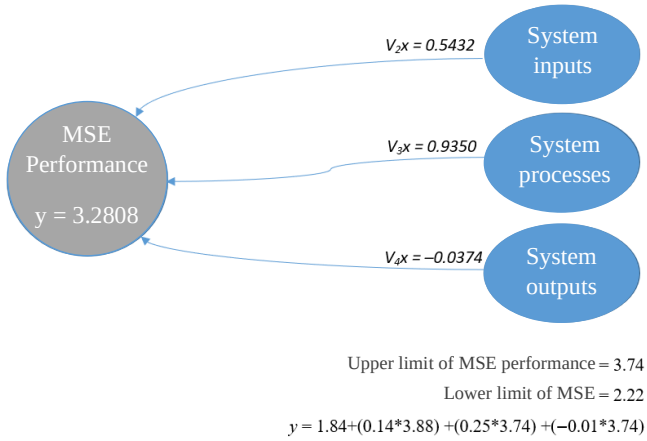

Figure 2. MSE Performance

The test for heteroscedasticity is carried out using the Breusch-Pagan test (Breusch & Pagan, 1979) to see if it is present in the linear regression. The Chi-Square test is calculated using the formula of the number of observations times the squared residuals (R2=0.0609 with 3 degrees of freedom). Subsequently, the right-tailed chi-square distribution is calculated, resulting in p equal to 0.97911. Since it is not less than 0.05, homoscedasticity is assumed to be present in the linear regression.

Table 7
R2 and degrees of freedom

Model Fit Measures					Overall Model Test			
Model	R	R^2	Adjusted R^2	RMSE	F	df1	df2	p
1	0.247	0.0609	0.0609	0.798	841	3	38865	< .001

Source: created by the author

Furthermore, the Games-Howell test (Games *et al.*, 1981) was performed to verify if the variances were unequal. It was observed that there are differences in the variances of the variables (inputs, processes, and outputs of the system) since p is less than 0.05, as can be seen in Tables 8, 9, and 10 correspondingly. MSE performance is measured on a 5-point Likert scale ranging from one, where performance has decreased significantly, to five, where performance has increased significantly.

Table 8
Games-Howell Post-Hoc Test - V2 System Inputs

MSE Performance		1	2		3		4		5	
1	Mean difference	—	-0.1026	***	-0.1432	***	-0.2833	***	-0.508	***
	t-value	—	-5.54		-8.129		-16.734		-28.15	
	df	—	3918.3		3278.3		2811.1		3564.7	
	p-value	—	< .001		< .001		< .001		< .001	
2	Mean difference		—		-0.0405	**	-0.1806	***	-0.406	***
	t-value		—		-3.695		-18.368		-34.74	
	df		—		13820.4		10396.2		11952.9	
	p-value		—		0.003		< .001		< .001	
3	Mean difference				—		-0.1401	***	-0.365	***
	t-value				—		-17.552		-35.92	
	df				—		21055.7		12578.3	
	p-value				—		< .001		< .001	
4	Mean difference						—		-0.225	***
	t-value						—		-25.22	
	df						—		9068	
	p-value						—		< .001	
5	Mean difference								—	
	t-value								—	
	df								—	
	p-value								—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

Table 9
Games-Howell Post-Hoc Test - V3 System Process

MSE Performance		1	2		3		4		5	
1	Mean difference	—	-0.0935	***	-0.1201	***	-0.3	***	-0.533	***
	t-value	—	-5.37		-7.26		-18.88		-30.84	
	df	—	3952.8		3300.3		2829.11		3808.85	
	p-value	—	< .001		< .001		< .001		< .001	
2	Mean difference		—		-0.0266		-0.207	***	-0.439	***
	t-value		—		-2.51		-21.63		-37.52	
	df		—		13699		10573.5		11667.9	
	p-value		—		0.12		< .001		< .001	

3	Mean difference			—	-0.18	***	-0.413	***
	t-value			—	-22.96		-39.84	
	df			—	21227.6		11498.2	
	p-value			—	< .001		< .001	
4	Mean difference				—		-0.233	***
	t-value				—		-25.05	
	df				—		8567.9	
	p-value				—		< .001	
5	Mean difference						—	
	t-value						—	
	df						—	
	p-value						—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

Table 10
Games-Howell Post-Hoc Test - V4 System Outputs

MSE Performance		1	2		3	4		5	
1	Mean difference	—	-0.0712	*	-0.0566	-0.2204	***	-0.479	***
	t-value	—	-2.88		-2.405	-9.779		-19.454	
	df	—	4327.9		3651.3	3105.8		4236.5	
	p-value	—	0.046		0.154	< .001		< .001	
2	Mean difference		—		0.0147	-0.1492	***	-0.408	***
	t-value		—		0.939	-10.587		-23.657	
	df		—		14989.8	11835.5		12313.6	
	p-value		—		0.936	< .001		< .001	
3	Mean difference				—	-0.1639	***	-0.423	***
	t-value				—	-13.812		-27.305	
	df				—	22981.6		12173.7	
	p-value				—	< .001		< .001	
4	Mean difference					—		-0.259	***
	t-value					—		-18.547	
	df					—		9263.5	
	p-value					—		< .001	
5	Mean difference							—	
	t-value							—	
	df							—	
	p-value							—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

The Durbin and Watson autocorrelation test (White, 1992) was carried out to observe the independence of the residuals. The test yielded a result of 1.81, concluding that there is no autocorrelation between the variables.

Table 11
Durbin-Watson test for autocorrelation

Durbin–Watson Test for Autocorrelation		
Autocorrelation	DW Statistic	p
0.0973	1.81	< .001

Source: created by the author

The collinearity test was performed through the variance inflation factor (VIF) to detect the presence of linear relations between the independent variables (Salmerón et al., 2016). It can be observed that the tolerances are greater than 0.1 and the VIF less than 10, with which it is concluded that there is no collinearity between the independent variables, as shown in Table 12.

Table 12
Tolerance and Variance Inflation Factor

Collinearity statistics		
	VIF	Tolerance
V2 System inputs	1.76	0.567
V3 System processes	2.10	0.477
V3 System outputs	1.57	0.637

Source: created by the author

Once it is determined that the model is reliable and valid, and it has been determined that the system processes are the variable that has the greatest impact, H_1 and H_3 are discarded, and H_2 is proposed: The system processes (management, finance, production-operation, innovation, marketing) are the factors that contribute most to improving performance in the MSE (profits, sales, number of employees) to determine which sub-variable of the system process has the greatest impact on the MSE's performance. The general equation is shown below.

$$y = \text{Constant} + V_D x + V_F x + V_O x + V_M x + V_I x$$

The statistical analysis is then carried out to determine each sub-variable's means and standard deviation (see Table 13). The highest score was found for production and operation (mean 4.25).

Table 13
Statistical analysis of V3 system processes
Valid cases = 48 068; cases with missing values = 372

Variable	Qty.	Mean	Std. dev.
Management (V_D)	47 949	3.73	0.77
Finance (V_F)	47 924	3.92	0.79
Production and operation (V_O)	47 794	4.25	0.73
Marketing (V_M)	47 938	3.60	0.82
Innovation (V_I)	47 920	3.31	1.04

Source: created by the author

Linear regression is carried out, where performance (V1) is the dependent variable, and the independent variables are management (VD), finance (VF), production and operation (VO), marketing (VM), and innovation (VI). The results are shown below. In the end, the values are substituted.

Table 14
Linear regression of the system process

	Standardized numerical coefficients		Standardized coefficients		
	B	Standard error	Beta	t	Sign.
Constant	2.18	0.03	0.00	70.26	0.000
Management (V_D)	0.11	0.01	0.08	12.54	0.000
Finance (V_F)	0.10	0.01	0.08	13.78	0.000
Production and operation (V_O)	–0.03	0.01	–0.02	–4.52	0.000
Marketing (V_M)	0.04	0.01	0.03	5.15	0.000
Innovation (V_I)	0.09	0.01	0.09	13.85	0.000

Source: created by the author

The linear regression equation is solved with the results of Table 12, where it is observed that the (V_D) management has a greater weight in the system process, as shown in Figure 3 with 0.4103. Once the equation is solved, they have an impact of 3.2967 on the MSE performance.

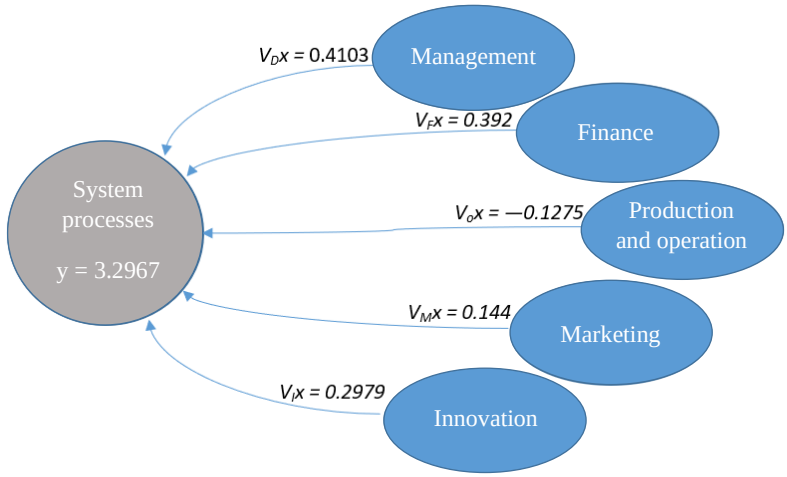

Figure 3. System Process Performance

The test for heteroscedasticity is carried out using the Breusch-Pagan test (Breusch & Pagan, 1979) to see if it is present in the linear regression. The Chi-Square test is calculated using the formula of the number of observations times the squared residuals (R2=0.0574 with 5 degrees of freedom). Subsequently, the right-tailed chi-square distribution is calculated, resulting in p equal to 0.95932. Since it is not less than 0.05, homoscedasticity is assumed to be present in the linear regression.

Table 15
R2 and degrees of freedom

Model Fit Measures										
							Overall Model Test			
Model	R	R^2	Adjusted R^2	AIC	BIC	RMSE	F	df1	df2	p
1	0.240	0.0574	0.0573	100726	100786	0.801	513	5	42068	< .001

Source: created by the author

The Games-Howell test (Games et al., 1981) is also used to test for unequal variances. For unequal variances and in the system process sub-variables (management (V_D), finance (V_F), production

and operation (V_O), marketing (V_M), and innovation (V_I)), differences are observed depending on the level of the system process (five-point Likert-type scale).

Table 16
Games-Howell Post-Hoc Test - Management

System process		1	2		3		4		5	
1	Mean difference	—	-0.1118	***	-0.1264	***	-0.31	***	-0.547	***
	t-value	—	-5.676		-6.722		-17.24		-28.04	
	df	—	4186.4		3567.3		3011		4014.7	
	p-value	—	< .001		< .001		< .001		< .001	
2	Mean difference		—		-0.0146	***	-0.198	***	-0.435	***
	t-value		—		-1.223		-18.63		-33.39	
	df		—		15033.8		11275		12494.3	
	p-value		—		< .001		< .001		< .001	
3	Mean difference				—		-0.184	***	-0.42	***
	t-value				—		-20.63		-36.09	
	df				—		21960.6		12678.4	
	p-value				—		< .001		< .001	
4	Mean difference						—		-0.237	***
	t-value						—		-22.99	
	df						—		9125.1	
	p-value						—		< .001	
5	Mean difference								—	
	t-value								—	
	df								—	
	p-value								—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

Table 17
Games-Howell Post-Hoc Test - Finance

System process		1	2		3		4		5	
1	Mean difference	—	-0.0993	***	-0.1193	***	-0.291	***	-0.513	***
	t-value	—	-4.83		-6.12		-15.52		-25.37	
	df	—	4254.9		3513.9		3017.2		3978.5	
	p-value	—	< .001		< .001		< .001		< .001	
2	Mean difference		—		-0.02	***	-0.191	***	-0.414	***
	t-value		—		-1.6		-16.97		-30.39	

	df	—		14508.8		11178.6		12552.6	
	p-value	—		< .001		< .001		< .001	
3	Mean difference			—		-0.171	***	-0.394	***
	t-value			—		-18.77		-33.09	
	df			—		22492.6		12505.9	
	p-value			—		< .001		< .001	
4	Mean difference					—		-0.222	***
	t-value					—		-20.96	
	df					—		9264.8	
	p-value					—		< .001	
5	Mean difference							—	
	t-value							—	
	df							—	
	p-value							—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

Table 18
Games-Howell Post-Hoc Test - Production-Operation

System process		1		2		3		4		5	
1	Mean difference	—		-0.0429	***	-0.0177	***	-0.1257	***	-0.277	***
	t-value	—		-2.222		-0.956		-7.087		-14.48	
	df	—		4181.6		3581.9		3064.5		4022.7	
	p-value	—		< .001		< .001		< .001		< .001	
2	Mean difference			—		0.0252	***	-0.0829	***	-0.234	***
	t-value			—		2.204		-8.104		-18.75	
	df			—		15236.8		11562.8		12690.4	
	p-value			—		< .001		< .001		< .001	
3	Mean difference					—		-0.1081	***	-0.259	***
	t-value					—		-12.643		-23.25	
	df					—		22517		12835.3	
	p-value					—		< .001		< .001	

4	Mean difference						—	-0.151	***
	t-value						—	-15.29	
	df						—	9359.9	
	p-value						—	< .001	
5	Mean difference							—	
	t-value							—	
	df							—	
	p-value							—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

Table 19
Games-Howell Post-Hoc Test - Innovation

System process		1		2		3		4		5	
1	Mean difference	—		-0.13	***	-0.1972	***	-0.439	***	-0.74	***
	t-value	—		-5.23		-8.36		-19.4		-29.38	
	df	—		4436.98		3752.42		3206.02		4615.87	
	p-value	—		< .001		< .001		< .001		< .001	
2	Mean difference			—		-0.0676	***	-0.309	***	-0.61	***
	t-value			—		-4.3		-21.74		-33.89	
	df			—		15255.78		12213.5		12268.21	
	p-value			—		< .001		< .001		< .001	
3	Mean difference					—		-0.242	***	-0.543	***
	t-value					—		-20.09		-33.24	
	df					—		23638.93		11656.12	
	p-value					—		< .001		< .001	
4	Mean difference							—		-0.301	***
	t-value							—		-20.17	
	df							—		9053.18	
	p-value							—		< .001	
5	Mean difference									—	
	t-value									—	
	df									—	
	p-value									—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

Table 20
Games-Howell Post-Hoc Test - Marketing

System process		1	2		3		4		5	
1	Mean difference	—	-0.0713	**	-0.108	***	-0.282	***	-0.51	***
	t-value	—	-3.61		-5.76		-15.7		-25.41	
	df	—	4446.18		3741.06		3170.46		4650.03	
	p-value	—	0.004		< .001		< .001		< .001	
2	Mean difference		—		-0.0367	*	-0.211	***	-0.439	***
	t-value		—		-2.91		-18.49		-30.23	
	df		—		15023.7		11879.77		12100.94	
	p-value		—		0.042		< .001		< .001	
3	Mean difference				—		-0.174	***	-0.402	***
	t-value				—		-18.12		-30.57	
	df				—		23052.77		11416.17	
	p-value				—		< .001		< .001	
4	Mean difference						—		-0.229	***
	t-value						—		-19.04	
	df						—		8774.83	
	p-value						—		< .001	
5	Mean difference								—	
	t-value								—	
	df								—	
	p-value								—	

Note: * p < .05, ** p < .01, *** p < .001

Source: created by the author

The Durbin and Watson autocorrelation test (White, 1992) was carried out to observe the independence of the residuals. The test yielded a result of 1.82, concluding that there is no autocorrelation between the variables.

Table 21
Durbin-Watson test for autocorrelation

Autocorrelation	DW Statistic	p
0.0917	1.82	< .001

The collinearity test is carried out through the variance inflation factor (VIF) to detect the presence of linear relations between the independent variables (Salmerón et al., 2016). It can be observed that the tolerances are greater than 0.1 and the VIF less than 10, leading to the conclusion that there is no collinearity between the independent variables, as shown in Table 10.

Table 22
Tolerance and Variance Inflation Factor

	VIF	Tolerance
Management (VD)	2.00	0.501
Finance (VF)	1.65	0.604
Production and operation (VO)	1.45	0.688
Marketing (VM)	2.28	0.438
Innovation (V_I)	2.10	0.477

Source: created by the author

Discussion

Several authors have worked to create a reference framework for the processes followed by MSEs (Aguilar & Peña, 2021; Peña et al., 2019; Posada et al., 2016). Nevertheless, the difficulty in studying them lies in the large number of economic units and the differences they represent in terms of lines of business and in the characteristics of the entrepreneurs. This diversity has sparked the interest of researchers who have sought patterns of behavior, addressing various topics ranging from entrepreneurship to what has caused the closure of MSEs (Aydiner et al., 2019; Barba-Sánchez & Atienza-Sahuquillo, 2017; Everett & Watson, 1998; Peña et al., 2017; Tiwari et al., 2017; Urbano et al., 2019; among others). While it is true that several studies have been conducted, the contribution of this research is determined by the number of variables that are related through a systemic analysis, where it is established which factors have the greatest impact on the performance of MSEs.

This study begins by analyzing the entrepreneur's perception of the enterprise's performance (sales, profits, and number of employees - dependent variable). Through systemic analysis (Aydiner et al., 2019; Von Bertalanffy, 1976), a pattern of behavior is sought to determine which variable the MSE managers focus more on to increase their performance. It starts with three independent variables: system inputs, processes, and outputs. System processes (management, finance, production-operation, innovation, marketing) are the factors that contribute most to improving MSE performance. Management is the sub-variable that has the greatest impact on improving the system's processes since it allows decision making to achieve objectives, although the available resources regulate this. Moreover, the experience and attitudes of the manager (Kroon et al., 2013) were considered as the procedures of seeking continuous improvement, reserving resources for innovation, setting objectives, and meeting them, regardless of the formal or informal structure (Charles, Ojera, & David, 2015) established.

Conclusions

This research aimed to determine which factors contribute to improving the performance of MSEs. The study was carried out with the systemic analysis that considers the enterprise in processes that have inputs and outputs, considering three groups: inputs (with an impact of 0.5432), input processes (with an impact of 0.9350), and outputs of the input system (with an impact of -0.0374). Quantitative studies make it possible to observe behavior patterns; therefore, it can be concluded that within the system process, it is in management (with an impact of 0.5432) where MSEs' managers should place greater emphasis since the enterprises that perform better show such a tendency.

The results presented in this study provide an empirical basis for promoting the performance (sales, profits, and number of employees) of MSEs. The implementation of the mission and vision, the continuous planning of the activities to be carried out, and the establishment of objectives and their follow-up lead to the implementation of processes for continuous improvement, significantly influencing performance. The importance lies in the fact that the increase in competition from local and foreign enterprises has caused MSEs to lose competitiveness in the markets in recent years, as can be seen. MSEs represent more than 90% of the business sector worldwide and generate more than 33% of the gross domestic product (Durán, 2017), so management is an alternative for them to be more competitive in the markets.

Limitations of the study

This research was carried out in four Latin American countries, in 48 068 MSEs. The manager was considered to be the person who makes most of the decisions. The study sample was segmented by the number of workers, ranging from one to fifty. Due to this segmentation, it can be mentioned that although it contributes to knowledge due to the breadth of variables used, the results are rather general. In future research, it would be worthwhile to segment interviewees by characteristics of the managers (age, gender, level of education, and skills, among others) and by type of enterprise (commercialization, transformation, and services), thus providing a broader scope.

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