Percepción de los principales factores que inciden en la productividad de las mipymes en Durango, México

Perception of the main factors that affect the productivity of MIPyMES in Durango, Mexico

Percepção dos principais fatores que afetam a produtividade das MPMEs em Durango, México

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Resumen

El propósito de este artículo es determinar los principales factores y su impacto en la productividad de las micro, pequeñas y medianas empresas (mipymes) en Durango, México. Para ello, se analizó la información disponible en fuentes secundarias —como artículos publicados en revistas indexadas— en torno al significado de productividad y los factores que influyen en ella. Además, se recopilaron datos mediante la elaboración y aplicación de un instrumento cuantitativo basado en una escala de Likert, diseñado mediante un sistema de cuatro factores —cada uno con nueve variables como determinantes de la productividad—, el cual arrojó un coeficiente de confiabilidad (alfa de Cronbach) de 0.944. Este instrumento se desarrolló a partir de investigaciones previas sobre los factores que más influyen en las mipymes. Al aplicar la matriz de correlación, se encontró que las variables que más impactan en la productividad son el compañerismo y el control estratégico, seguidos por la cultura y el clima organizacional. Estos elementos fueron evaluados mediante la aplicación del

instrumento en empresas atendidas por el Centro de Negocios de la Universidad Juárez del Estado de Durango.

Palabras clave: mipymes (micro, pequeñas y medianas empresas), productividad, estructura organizacional, eficiencia.

Abstract

The objective of this article is to determine the perception of what are the main factors and the degree to which they affect the productivity of SMEs in the city of Durango, Mexico, for which the meaning will be analyzed, as well as the factors that intervene in the productivity, based on information from secondary sources associated with articles from indexed journals, which allow determining the types of factors implicit in productivity, as well as primary information, through the development and application of a quantitative instrument, with a Likert scale. , using a categorical system that brought together 4 factors, each with 9 variables as determinants of productivity.

To carry out this research, an instrument was developed which resulted in a reliability coefficient (Cronbach's Alpha) of .944, an instrument developed based on previous research about the factors with the highest incidence in SMEs; Applying the correlation matrix resulted in the most decisive categories in productivity being camaraderie and strategic control, followed by organizational culture and climate, these elements were evaluated through the application of the instrument to companies served by the Business Center of the Juárez University of the State of Durango."

Keywords: MIPyMES (Micro, Small and Medium Enterprises), productivity, organizational structure, efficiency.

Resumo

O objetivo deste artigo é determinar os principais fatores e seu impacto na produtividade das micro, pequenas e médias empresas (MPMEs) em Durango, México. Para isso, foram analisadas as informações disponíveis em fontes secundárias – como artigos publicados em periódicos indexados – quanto ao significado da produtividade e os fatores que a influenciam. Além disso, os dados foram coletados por meio do desenvolvimento e aplicação de um instrumento quantitativo baseado em escala Likert, elaborado a partir de um sistema de quatro fatores – cada um com nove variáveis como determinantes da produtividade – que

rendeu um coeficiente de confiabilidade (alfa de Cronbach) de 0,944. Este instrumento foi desenvolvido a partir de pesquisas anteriores sobre os fatores que mais influenciam as MPME. Ao aplicar a matriz de correlação, constatou-se que as variáveis que mais impactam a produtividade são a camaradagem e o controle estratégico, seguidas da cultura e do clima organizacional. Estes elementos foram avaliados através da aplicação do instrumento em empresas atendidas pelo Centro de Negócios da Universidade Juárez do Estado de Durango.

Palavras-chave: MPMEs (micro, pequenas e médias empresas), produtividade, estrutura organizacional, eficiência.

Introduction

The importance of small and medium-sized enterprises (SMEs) is undeniable in the economies of numerous countries, including Australia, Canada, Korea, Chile, China, United States, Philippines, Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea , Peru, Russia, Singapore, Taiwan, Thailand and Vietnam, where they represent more than 97% of all businesses and employ more than half of the workforce (Economía, 2020).

In the Mexican context, according to the 2019 economic censuses published by the National Institute of Statistics and Geography (Inegi), microenterprises constitute 97.05% of economic units, while 2.68% are small and medium-sized companies, with only 0.27% corresponding to large companies. These figures reveal that SMEs are the backbone of the Mexican economy, hence they contribute significantly to the gross domestic product (GDP) with 52% and generate 72% of employment in the country (Inegi , 2021).

Due to their characteristics, these economic units tend to experience greater fluctuations in terms of income, employed personnel, location, closures and openings, among other aspects, which has prompted the business sector to establish strategies that seek to improve the efficiency of their processes with the in order to guarantee its survival and permanence in the market.

According to the Business Demographic Study 2020 (EDN2020), of the 4.9 million establishments in Mexico, it is estimated that, in 2021, 1.2 million were born while 1.6 million closed permanently. This marks a significant change compared to the period from May 2019 to September 2020, where 619,443 companies were born and 1,010,857 closed permanently (Inegi , 2021).

Now, for the effective operation of SMEs, the management of various factors is necessary, such as human resources, capital, technology and raw materials, among others, hence it is essential to evaluate the performance of these factors and their contribution. to achieve business objectives. In this sense, productivity arises by comparing the proportion of resources used with the results obtained, which requires adequate measurement and management tools to adjust strategies according to the results.

The intensity and influence of the factors that affect productivity may vary, since the conditions to achieve the relationship between resources used and results are unique in each case. Therefore, this research seeks to answer the following key question: ¿what factors and to what extent influence the productivity of SMEs?

For this, we have started from the hypothesis that human relationships are the predominant factor in productivity, since the social, emotional and psychological needs of the individual are essential to achieve organizational success. To design this research, the contribution of previous works has been analyzed, such as those of Kamble and Wankhade (2017), López *et al.* (2021) and Asavanirandorn *et al.* (2022). This analysis has identified ten common factors that affect the productivity of organizations, which served as the basis for this study.

Theoretical framework

Productivity concept

According to the definition of Prokopenko (1991), productivity consists of the optimization of resources (labor, capital, land, materials, energy and information) for the manufacture and delivery of products and services. This means that an increase in productivity means obtaining more results with the same amount of resources, which translates into an increase in both quantity and quality with the same inputs.

Rodríguez and Bravo (1991) describe productivity as the ability of a system to manufacture products that satisfy the specific needs and requirements of users, while maximizing efficiency in the use of available resources. This involves two key approaches to improvement: producing what the market and customers value and demand, and achieving it with the lowest possible expenditure of resources.

From the perspective of Riggs (2008), productivity can be understood as a metric used to measure how efficiently available resources are used to achieve the desired production, while Amaru Maximiano (2009) conceptualizes productivity as the proportion between the

resources invested and the achievements obtained. In other words, the greater the number of results obtained with the same amount of resources, the more efficient and productive the system will be considered.

According to Robbins and Judge (2009), productivity is defined as the achievement of objectives by transforming inputs into products efficiently and at the lowest possible cost. This definition implies a double consideration: effectiveness, which refers to the achievement of goals; and efficiency, which is related to the optimization in the use of raw materials.

On the other hand, Pulido (2010) conceives productivity as the result obtained by comparing the resources used in a process (e.g., number of workers, total time invested, machine hours, among others) and the achievements achieved, which can manifest themselves in various ways, such as units produced, items sold or economic benefits.

Continuing with contemporary theorists such as Koontz *et al.* (2012), productivity encompasses not only the quantity of production, but also its quality. In other words, productivity reflects the combination of effectiveness and efficiency in performance at both the individual and organizational levels. It is about achieving effective and efficient results in a given time frame, taking into account the quality of the products or services offered.

According to the International Labor Organization (2015), productivity can be understood as the efficient use of innovation and available resources to increase the added value of products and services. This process is based on two key approaches: first, increasing production without changing the amount of inputs used, which leads to the manufacture and sale of more products; second, reduce the amount of inputs used without reducing production, which implies reducing the costs associated with the resources implemented in the company. Therefore, productivity focuses on maximizing the added value of products and services through the efficient management of innovation and resources.

Productivity dimensions

To analyze the dimensions of productivity, previous research was taken into account, the conclusions of which are detailed below. For example, Prokopenko (1991) points out that productivity improvement is linked to the ability to identify and efficiently use the main factors of the production system, as described in table 1.

Table 1 Main factors that affect productivity according to Prokopenko (1991).

Dimension	Scope
Hard factors	Product, plant and equipment, technology, materials and energy
Soft factors	People, organization and systems, work methods, management styles
Structural adjustments	Economic, Demographic and social.
Natural resources	Labor, land, energy, raw materials
Public administration and infrastructure	Institutional mechanisms, policies and strategy, infrastructure, public companies

Source: Author's own elaboration

According to Sumanth (1992), in 1981 the United States Department of Commerce classified 25 factors that have contributed to the decline in productivity growth in that country. The most studied and with the greatest impact are presented in table 2.

Table 2 Factors that affect productivity according to Sumanth (1992).

Dimension	Scope
Investment	Infrastructure and technology
Capital/labor ratio	Liquidity to meet company obligations
Investigation and development	Innovation in products and services
Capacity utilization	Technological and infrastructure efficiency
Government regulation	Licenses and permits
Plant and equipment life	Maintenance and replacement of technical infrastructure
Energy costs	Energy efficiency to address high volatility and high energy costs.
Workforce mix	Adequate workforce development
Work ethics	Morale of workers and managers
Workers fear losing their jobs	Outdating of workers
Union influence	Cooperation attitude between management and workers
Administration	Lack of planning to achieve objectives

Source: Author's own elaboration

On the other hand, Cequea and Núñez Bottini (2011) refer to a latent structure of four factors that impact the productivity of organizations shown in table 3.

Table 3 Classification of factors that affect productivity according to Cequea and Núñez Bottini (2011).

Dimension	Scope
Individual factors	The psychological processes of the individual or internal aspects of the person, in how they perceive what happens to them and how they react to environmental stimuli: absenteeism, internalization of objectives, participation, motivation, job satisfaction and rotation
Group factors	Related to the psychosocial processes that individuals experience when they interact or socialize with others in groups with a common objective: recreation, cohesion, morale and conflict
Organizational factors	Related to structural elements of the organization that affect the performance of the individual and groups: interpersonal skills of management, flexibility, emphasis on achievement, information and communication management, salaries and wages, training and development, accident rate and quality
Outcome factors	Organizational results as a consequence of people's management of available resources and their decisions: production and growth

Source: Cequea and Núñez Bottini (2011)

Lopez *et al.* (2021) propose a categorical construct of 10 factors based on analysis of secondary information (table 4), based on works by Quintero Arango and Betancur Arias (2018), Maia and Sakamoto (2018) and Vera (2009) .

Table 4 Categorical construct of 10 factors that affect productivity.

Dimension	Scope
Social aspects	Is the social environment in which the organization finds itself safe?
Salary compensation	What are the salaries that the organization pays to its employees and workers?
Staff training	Are there training processes of the organization with its workers?
Policy articulation and government support	How is the communication between workers and bosses?
Physical infrastructure	Does the organization have physical infrastructure to carry out its activities?
Employment stability	Does the organization provide job stability with its workers?
Motivation	Do workers feel motivated in the work environment?
Adaptability to change	Do you consider that the organization is permeable to the changes that are generated in the environment and adapts to the new conditions?
Innovation, research and technological advancement	Do you think that the products produced by the organization are innovative in the market?
Environment	Do you have environmental awareness when you are in the organization?

Source: López *et al.* (2021)

Likewise, Asavanirandorn *et al.* (2022) propose a model of seven factors (Table 5) that influence the productivity of older workers in the Thai service sector. Their findings indicate that this variable is influenced by their educational level, type of employment, occupational characteristics, health and financial status, while they are not affected by gender and age factors.

Table 5 Model of seven factors that affect productivity in older workers.

Dimension	Scope
Age	Age is reported as a discrete number (year).
Gender	Gender includes masculine and feminine.
Education	Education consisted of two levels: below undergraduate and undergraduate and higher
Employee Type	The type of employment consists of two categories: full-time and part-time.
Occupational characteristics	The variable that highlights the majority of the tasks/work that the employee has to do is divided into three categories: • General: Job that does not require specific skills (security guard/maid, shopkeeper, cashier). • Intensive in communication and coordination: Job requiring strong communication and coordination-customer service skills (sales representative, coordinator). • Specific or intensive in technical knowledge: Work that requires technical knowledge (consultant, inspector, manager).
Self-perceived health status	Represent employees' perception of their health. Condition: Good condition or uncertainty/poor condition.
Financial situation	Represent employees' perception of their financial status: satisfied (finances are sufficient to cover daily expenses) or otherwise/dissatisfied (finances are insufficient to cover daily expenses).

Source: Asavanirandorn *et al.* (2022)

Materials and method

For this research work, an exhaustive search was carried out on various platforms that offer scientific content, among which the works of Cequea stand out. *et al.* (2011), Kamble and Wankhade (2017), López *et al.* (2021), and Asavanirandorn *et al.* (2022). Specifically, their contributions were analyzed, which resulted in the identification of four coincident factors present in the aforementioned studies (Table 6).

Table 6 Coincident factors that affect the productivity of organizations.

Dimension	Variables
Individual factors	Stress, commitment, motivation, job stability, skills, participation, family, health status, worker ethics.
Relational factors	Moobing , teamwork, conflict management, cohesion, communication, camaraderie, inclusive culture, rules of coexistence.
Organizational factors	Organizational culture, leadership, training, organizational climate, empowerment , remuneration, risks and accidents, flexibility, innovation and development.
Outcome factors	Achievement of objectives, growth, furniture and equipment, raw materials, technology, standards, "strategic control, lighting, willingness to change.

Source: Author's own elaboration

Subsequently, an instrument composed of four dimensions was developed, the result of the coincident factors that affect productivity in organizations. Each dimension was broken down into 10 variables. This instrument was validated using Cronbach's alpha correlation index (Cronbach and Meehl , 1955), used to evaluate the reliability of the internal consistency of a scale. The result was 0.944.

Likewise, the Likert-type scale was used, a quantitative data collection method, as described by Maldonado Luna (2007). This scale consists of a series of statements or statements to which the participant's response is requested. Each statement represents the property the researcher seeks to measure, and people are asked to express their degree of agreement or disagreement with each idea. Typically, five response options are used, ranging from "strongly disagree" to "strongly agree." Each category is assigned a numerical value, and the total score is obtained by adding the scores of all the statements, which reflects the position of the participant.

Instrument reliability

The reliability of an instrument is a crucial aspect in research. According to Oviedo and Campo Arias (2005), Cronbach's alpha coefficient, developed by Lee J. Cronbach in 1951, is used to evaluate the internal consistency of a scale. Basically, this measures the extent to which the elements of an instrument are related to each other. In other words, Cronbach's alpha represents the average of the correlations between the different elements that make up an instrument.

Cronbach's alpha is, in general terms, a squared correlation coefficient that assesses the homogeneity of questions by calculating all correlations between items to verify their

similarity. The interpretation of this coefficient is based on its proximity to the value 1; that is, the closer it is to the extreme of 1, the higher the reliability of the instrument. A coefficient equal to or greater than 0.80 is considered to indicate strong reliability (Quero Virla , 2010).

Sample characteristics

The characteristics of the sample refer to the specific set of individuals or elements selected from the population of interest for data collection in an investigation. The importance of this process lies in the fact that the sample must be representative of the population in question, which implies that the individuals or elements selected faithfully reflect the diversity and characteristics present in the total population. In other words, a well-designed sample should fairly reflect the characteristics and properties of the population as a whole so that inferences and generalizations can then be made with greater confidence. Therefore, the selection of a representative sample and the precise definition of its characteristics are crucial aspects in the design of a research, since they directly affect the validity and applicability of the results to the population of interest.

Now, it should be noted that although the topic of this work (productivity) has been studied by several authors, no evidence was found of a research aimed specifically at companies graduated from a business center, particularly in the Mexican Republic. Therefore, the instrument was applied to a database of companies served by the Business Center of the Juárez University of the State of Durango, specifically in the following aspects: graduated companies, companies with a profile in the food sector, companies with export profile and, finally, graduated companies.

Sample size

The sample size refers to the number of elements deliberately selected from the databases available at the Business Center of the Universidad Juárez del Estado de Durango in order to represent the entire population of 180 business units. To do this, a confidence level of 95% was established, which implies a high degree of confidence that the results obtained from this sample still accurately reflect the characteristics and trends present in the total population.

It should be noted that the choice of sample size and level of confidence are critical decisions in the design of a research, since they directly influence the precision and validity of the results. In this case, 24 business units were carefully chosen, allowing inferences to be

made with a high degree of confidence about the entire population of 180 business units that make up the study universe.

Sample randomness

To strengthen the validity of the sample and ensure its randomness, four streak tests were carried out using non-probabilistic sampling, which were carried out individually for different segments of the sample, including the complete set of companies, companies that graduated from the Business Center, companies with a profile in the food sector and companies with an export profile.

The purpose of these tests was to examine and validate the null hypothesis, which maintains that the sample is random, where H0 establishes that the variables are independent and any observed relationship is casual.

On the other hand, the alternative hypothesis (H1) proposes that there is a causal association between the individual factor and the type of company, which implies that it is not a simple coincidence, but rather a genuine relationship.

This strategy of applying run tests in different segments of the sample strengthens the robustness of the findings and provides solid evidence about the randomness of the sample and the possible existence of causal relationships between the variables studied. The analysis and validation of the randomness of the sample are crucial aspects in any scientific study, since they guarantee the reliability and validity of the results obtained.

The analysis of the streak test applied to the complete sample of companies yielded an asymptotic significance value equal to 1. Consequently, the null hypothesis (H0) is accepted, which establishes the randomness of the sample results. In other words, the data obtained from the general sample are considered random and, therefore, can be generalized to the population of interest (table 7).

Total sample of companies
Table 7 Test of streaks to the total sample of companies.

	Gender
Test value [a]	2
Total cases	24
Number of streaks	13
Z	,000
asymptotic sig. (bilateral)	1,000
to. Median	

Source: Author's own elaboration

This finding suggests that there is no causal or significant relationship between the individual factors and the types of companies studied in the full sample. Instead, the results appear to be the result of chance and are not influenced by any specific variable. This validation of the randomness of the sample strengthens the reliability of the results and supports the idea that the findings are representative of the population, an essential aspect in scientific research.

On the other hand, the evaluation of the streak test in the sample of graduated companies (table 8) showed a significant result with an asymptotic significance value equal to 1. This result leads to the acceptance of the null hypothesis (H0), which supports the randomness of the results in this specific sample. This means that the data obtained in the group of graduated companies is random and, therefore, can be extrapolated to the population of interest.

This suggests that there is no causal or significant relationship between individual characteristics and the status of graduates of the companies in question. Instead, the results appear to be a product of chance and are not influenced by any particular variable.

Sample of graduated companies

Table 8 Test of streaks to the sample of graduated companies.

	Gender
Test value [a]	2
Total cases	8
Number of streaks	5
Z	,000
asymptotic sig. (bilateral)	1,000
to. Median	

Source: Author's own elaboration

The analysis of the streak test applied to the sample of companies with a profile in the food sector revealed an asymptotic significance value equal to 1. This result leads to the acceptance of the null hypothesis (H0), which suggests that the results of this sample are random in nature and are not influenced by any specific factor (Table 9).

Sample of food profile companies

Table 9 Test of streaks for the sample of companies with a profile in the food sector.

	Gender
Test value [a]	2
Total cases	8
Number of streaks	3
Z	,000
asymptotic sig. (bilateral)	1,000
to. Median	

Source: Author's own elaboration

This indicates that there is no causal or significant relationship between individual characteristics and the type of company in the food sector. Furthermore, the results appear to be randomly distributed and are not linked to particular variables. In other words, confirming randomness in this sample increases confidence in the validity of the results, which, in turn, allows the conclusions to be extended to all companies with a food profile.

This finding is of crucial importance in scientific research, as it guarantees the representativeness of the sample and the applicability of the results in a broader context.

The evaluation of the streak test applied to the sample of companies with an export profile yielded an asymptotic significance value equal to 1, which again leads to the acceptance of the null hypothesis (H0), which suggests that the specific results of This sample are random in nature and are not influenced by any specific factor (Table 10).

Sample of export profile companies

Table 10 Test of streaks for the sample of companies with an export profile.

	Gender
Test value [a]	2
Total cases	8
Number of streaks	5
Z	,000
asymptotic sig. (bilateral)	1,000
to. Median	

Source: Author's own elaboration

This data demonstrates that there is no causal or significant relationship between individual characteristics and the type of company in the export sector. Furthermore, the results appear to be distributed randomly and are not linked to particular variables. That is, the confirmation of randomness in this sample increases confidence in the validity of the results, which, in turn, allows the conclusions to be extended to all companies with an export profile.

Results

Reliability analysis

The instrument shows adequate internal consistency, both at the scale and factor level, with a Cronbach's alpha of .945. The results are shown below in table 11.

Table 11 Reliability of the instrument.

Cronbach's alpha	# of elements
.945	105

Source: Author's own elaboration

Cronbach's alpha is a squared correlation coefficient used to evaluate the homogeneity of questions on a scale, which is calculated by averaging all correlations

between all items on a scale to determine how similar the responses are to different questions. Greater similarity in responses indicates greater consistency in measurements.

The interpretation of Cronbach's alpha is crucial in evaluating the reliability of a scale. The closer the Cronbach's alpha value is to 1, the greater the reliability of the scale, meaning that the questions consistently measure the same characteristic or construct. In the scientific literature, a Cronbach's alpha equal to or greater than 0.80 is generally considered to indicate respectable reliability, suggesting that the scale is a valid tool for measuring the phenomenon of interest.

The use of Cronbach's alpha is vital in research, since it allows us to ensure that the measurements are reliable and consistent. This, in turn, guarantees that the results obtained in a study are representative and valid, which strengthens the quality of the research and its conclusions (Hernández *et al* ., 2014).

After applying the correlation coefficient to the entire instrument and each of the dimensions, the dimension with the greatest impact on productivity was evaluated according to the perception of the actors surveyed. The results and organizational dimensions stood out, which showed a high level of internal consistency, with a Cronbach's alpha of 0.917 and 0.939, respectively (Table 12).

Table 12 Cronbach's alpha results by dimension.

Dimension	Number of variables	Number of items	Cronbach's alpha
Individual factors	9	27	0.721
Relational factors	9	24	0.800
Organizational factors	9	27	0.939
Outcome factors	9	27	0.917

Source: Author's own elaboration

Subsequently, by applying the correlation coefficient, the variables of each dimension with the highest and lowest correlation were identified (Table 13).

Table 13 Dimensions and variables with the highest correlation.

Dimension	Variables	Number of items	Cronbach's alpha
Individual factors	Stress; stake; health condition	9	0.906 0.921 0.888
Relational factors	Conflict management; fellowship; House Rules	9	0.871 0.975 0.837
Organizational factors	Organizational culture; training; organizational climate	9	0.955 0.871 0.944
Outcome factors	Growth; standards; strategic control	9	0.891 0.944 0.957

Source: Author's own elaboration

In the dimension of individual factors, it stands out that the variable with the highest correlation is the collaborative participation of individuals in the achievement of organizational objectives. This finding suggests that employees' willingness to work as a team and contribute to the achievement of shared goals is a determining factor in increasing productivity.

On the other hand, it was observed that the motivation variable exhibited the lowest correlation, covering the impulses, desires and needs of the collaborators. This discrepancy could indicate that, in the context of this research, individual motivation does not significantly influence productivity.

Regarding the dimension of relational factors, it was identified that companionship has the highest correlation. That is, harmonious collaboration between employees, regardless of their differences, seems to be a fundamental element to improve organizational productivity. However, it was found that communication, which addresses the channels and forms of communication within the company, showed the lowest correlation, suggesting that, although this variable is essential, it may not have as much impact on improving productivity. in this specific context.

Likewise, within the dimension of organizational factors, it was highlighted that organizational culture presented the highest correlation, which means that the personality of the organization - defined by its values, mission and vision - plays a fundamental role in productivity.

On the other hand, remuneration, which encompasses compensation offered in exchange for services, showed the lowest correlation, which could indicate that, in this study, financial aspects are not the main driver of productivity.

Regarding the results dimension, it was found that strategic control is the factor with the highest correlation, which underlines the importance of systematic supervision to adapt the organizational strategy. This is followed by standards, which establish the knowledge and skills necessary for employees, while the growth factor, related to the establishment of professional goals, occupies third place. These data reflect the need for strategic management and staff development to boost productivity. Finally, the general analysis yielded the following results (table 14).

Table 14 Interpretative table: characterization of the sample.

Company profile	Number	Individual factor	Relational factor	Organizational factor	Results factor
Graduates	8	4	4	3.5	4
Food turn	8	3	4	4	4
Exporting business	8	3	4	3.5	4

Source: Author's own elaboration

Independence tests

Tests of independence were developed by preparing contingency tables (table 15, table 16, table 17, table 18), a fundamental tool in descriptive statistics. To do this, three categorical variables were considered: graduated companies, companies in the food sector and exporting companies, which made it possible to identify the relationships between variables using the chi-square test, as well as evaluate the link between the categorical variables. Asymptotic significance was considered as the probability of obtaining a result as extreme as that observed under the null assumption that there is no relationship between the variables.

Table 15 Contingency table individual factors by type of company.

Individual factors		Company type			Total
		Graduated companies	Food companies	Exporting companies	
	In disagreement	1	1	3	5
	Neither disagree nor agree	1	4	4	9
	OK	6	3	0	9
	Totally agree	0	0	1	1
Total		8	8	8	24

Source: Author's own elaboration

Table 16 Contingency table relational factors by type of company.

Relational factors		Company type			Total
		Graduated companies	Food companies	Exporting companies	
	In disagreement	1	2	1	4
	Neither disagree nor agree	1	0	1	2
	OK	5	6	5	16
	Totally agree	1	0	1	2
Total		8	8	8	24

Source: Author's own elaboration

Table 17 Contingency table organizational factors by type of company.

Organizational factors		Company type			Total
		Graduated companies	Food companies	Exporting companies	
	In disagreement	1	1	3	5
	Neither disagree nor agree	3	1	1	5
	OK	4	3	3	10
	Totally agree	0	3	1	4
Total		8	8	8	24

Source: Author's own elaboration

Table 18 Contingency table of results factors by type of company.

| Outcome factors | Company type | | | |
	Graduated companies	Food companies	Exporting companies	Total
In disagreement	2	0	1	3
Neither disagree nor agree	0	1	1	2
OK	6	7	5	18
Totally agree	0	0	1	1
Total	8	8	8	24

Source: Author's own elaboration

In the case of the individual factors according to the type of company, the results are presented in table 19. Chi-square tests for the individual factors, where an asymptotic value of 0.072 is observed. This figure is greater than 0.05, based on a standard significance level, suggesting that the null hypothesis is accepted at this significance level. In other words, there is not enough evidence to reject the null hypothesis, which means that there is no significant relationship between the way stress is managed, participation and the health status of employees depending on the type of company.

Table 19 Chi-square tests for individual factors.

	Worth	gl	Asymptotic sig. (2-sided)
Pearson chi-square	11,600 [to]	6	.072
No. of valid cases	24		

Source: Author's own elaboration

For the relational factors according to the type of company (Table 20), an asymptotic value of 0.739 was obtained, which is greater than 0.05 according to a standard significance level. This shows that there is not enough evidence to affirm that there is a significant association between the type of company and relational factors in terms of their impact on organizational productivity.

However, it is important to highlight that the relational factor continues to be significant in the productivity of organizations, although its influence may vary depending on the profile of the company. Aspects such as conflict management, camaraderie and coexistence rules can play a relevant role in productivity, but their relative importance may be different depending on the type of company.

Table 20 Chi-square tests for relational factors.

	Worth	gl	Asymptotic sig. (2-sided)
Pearson chi-square	8,571 [a]	12	.739
No. of valid cases	24		

Source: Author's own elaboration

Regarding the organizational factors according to the type of company (Table 21), an asymptotic value of 0.303 was obtained, which exceeds the threshold of 0.05 established as the standard significance level. This result suggests that there is not enough evidence to reject the null hypothesis, which indicates that there is no significant relationship between the type of company and aspects such as organizational culture, organizational climate and training.

Table 21 Chi-square tests for organizational factors.

	Worth	gl	Asymptotic sig. (2-sided)
Pearson chi-square	6,900 [to]	6	.330
No. of valid cases	24		

Source: Author's own elaboration

For the result factors according to the type of company (Table 22), an asymptotic value of 0.502 was found, which exceeds the threshold of 0.05 established as the standard significance level. This finding suggests that there is not enough evidence to affirm that there is a significant association between the different types of companies in terms of the results obtained.

Table 22 Chi-square tests for outcome factors.

	Worth	gl	Asymptotic sig. (2-sided)
Pearson chi-square	5,333 [a]	6	.502
No. of valid cases	24		

Source: Author's own elaboration

Discussion

In today's business environment, the diversity and specialization of companies are fundamental aspects to understand and address economic and commercial challenges. For this reason, the present study focused on three specific categories of companies graduated from a business center, which play significant roles in economic development: graduated companies, companies with a nutritional profile and companies with an export profile.

Table 14, called "Interpretive Table: Sample Characterization," provides a detailed look at how companies in each category excel on individual, relational, organizational, and outcome factors. There, notable patterns can be observed, such as the high weighting of the relational factor for all categories, which denotes great importance in the productivity of companies, where aspects such as conflict management, camaraderie and the rules of coexistence play an important role. crucial role.

These findings coincide with research carried out by Sanchez & Yurrebuzo *et al.* (2009), who found evidence that team cohesion, based on strong relationships, is positively related to the performance of the teams and, therefore, the company.

In this regard, it is relevant to highlight that, to achieve optimal levels of productivity, work teams must be complemented with appropriate organizational values and effective management of resources to improve performance, as pointed out by Ramírez Méndez *et al.* (2022). In this sense, participation contributes to expanding individual influence on organizational decisions, which generates a positive impact on productivity and reinforces the willingness and ability of individuals to participate in a committed manner.

On the other hand, in relation to the results factor, studies by Rojas (2018) demonstrate that the functions of controlling productivity based on the factors include guaranteeing positive results for the organization not only in a monetary way, but also by integrating the necessary strategies. to keep the company going. It is , therefore, the balance between efficiency and effectiveness, considered as an interrelated whole.

Ultimately, it can be said that the focus of successful organizations is people-centered. When employees are motivated, well organized and apply fundamental principles such as productivity, quality and ethical behavior, in addition to using technology in a balanced way for human advancement, the achievement of optimal levels of productivity becomes inevitable (Kour *et al.* , 2019).

Productivity, therefore, is configured as the tactic used to improve both the internal processes and external factors of an organization, which requires addressing the

contemporary challenges that companies face, such as rapid changes in the world, hence The ability to adapt to uncontrollable factors is required.

Finally, it is important to note that, although the independence tests confirmed certain conclusions, it is crucial to consider the interrelationship of the factors. In this research, these variables have been analyzed individually; However, it would be valuable to delve deeper into the study to better understand how they interact with each other and how this interaction can influence the productivity of organizations.

Conclusions

The research study carried out highlights the crucial importance of productivity in the functioning of companies. However, it is essential to emphasize that the lack of adequate business metrics can lead to a subjective assessment of productivity, based solely on the perceptions of business actors.

In this study, significant aspects were identified that have been validated as key dimensions that influence organizational productivity, according to the perception of business actors. These dimensions have been grouped into four fundamental factors: the individual factor, the relational factor, the organizational factor and the results factor.

In this regard, the organizational dimension stands out especially, where elements such as organizational culture, training and work environment have been identified as critical aspects to boost productivity. Secondly, the results dimension has proven to be relevant, with variables such as growth, standards and strategic control as essential contributors to the performance of organizations.

These findings emphasize the importance of considering both individual and collective aspects in improving business productivity. Additionally, they support the need to establish more objective and robust business metrics that allow for accurate, data-driven evaluation to guide the growth and success of organizations in the future.

Future lines of research

The economic development of a country like Mexico is closely linked to the efficiency and productivity of its companies. In this context, understanding the factors that directly affect productivity is vital to promoting sustainable growth. Therefore, this research work opens new lines of exploration that could enrich knowledge about the perception of the main drivers of business productivity in Mexico.

To deepen this analysis, it is proposed to carry out a qualitative study that allows a broader and more detailed understanding of the individual and collective perspectives on this topic. That is, conducting in-depth interviews with various relevant actors, such as business leaders, entrepreneurs, employees, and experts in the field, would offer the opportunity to capture rich narratives about business dynamics.

This approach would allow not only to identify the most obvious productivity factors, but also to explore underlying perceptions, deep-rooted beliefs and personal experiences that can influence business performance. In addition, special attention would be paid to aspects that may have been overlooked in previous research, which would significantly enrich the landscape of knowledge on this topic.

Careful selection of interview participants would ensure equitable representation of the various actors involved in the business environment of the city of Durango. This would serve to highlight the different business realities present in the region and would enrich not only the present research, but also the development of theories and models that more accurately reflect the complexity of the current business world.

Another line of research could focus on how economic globalization has intensified the interconnection between countries, creating a complex network of international trade and business relationships. This line could focus on an international comparative perspective, specifically on the evaluation of the perception of productivity factors in Mexican companies and other countries. In this way, possible cultural or structural differences that indicate the apparent lack of relationship between productivity factors in the Mexican business context could be identified and understood.

Annexes

Instrument of 4 coincident factors that affect the productivity of organizations

Dimensions	#	Variables	#	Items	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Totally agree (5)
Individual factors	1	stress	1	I feel stressed most of the time					
			2	I have the feeling that everything bothers me					
			3	I get angry easily					
	2	Commitment	4	I feel committed to achieving company objectives					
			5	I'm excited to come to work					
			6	I often think about looking for another job.					
	3	Motivation	7	I feel like I work a lot and my effort is not recognized.					
			8	At work, my opinions seem to count					
			9	I feel motivated by my work and					

				the opportunities that arise					
	4	Employment stability	10	I am satisfied with the distribution of workloads					
			eleven	I have received recognition or encouragement for doing a good job					
			12	It motivates me to know that I can grow professionally within the company					
	5	Competencies	13	The organization systematically develops in workers the skills it needs					
			14	I am able to perform tasks that require prolonged and hard effort.					
			fifteen	I am able to adequately analyze causes and effects					

	6	Stake	16	I tend to get involved in the decisions made at my work.					
			17	My contributions regarding the achievement of objectives are important for the company					
			18	I like to propose new ideas in my workplace					
	7	Family	19	When I'm at work, do I think about domestic and family demands?					
			twenty	I find it difficult to maintain emotional control with personal conflicts					
			twenty-one	There are situations in which you should be at work and at home at the same time (to care for a					

			sick child, for an accident involving a family member, to care for grandparents, etc.					
8	Health condition	22	I have some health problems					
		23	I think that my current state of health limits me from carrying out some type of activity.					
		24	My physical health and/or emotional problems have made my work activities difficult					
9	Worker ethics	25	I usually break rules to achieve goals.					
		26	I believe that the end justifies the means					
		27	I usually feel guilty after making decisions at work.					

Relational factors	1	moobing	28	Colleagues and bosses often make jokes that make me feel uncomfortable.					
			29	I have witnessed harassment towards a co-worker					
			30	The dignity or moral integrity of a colleague has been attacked					
	2	Teamwork	31	I consider that I have contributed what is expected of me in the work teams in which I have participated in my organization.					
			32	I find it easy to collaborate with my colleagues					
			33	The integration of work teams to achieve an objective is common.					
	3		3.4	Conflict is considered					

			something natural and useful, which, when handled constructively, leads to solutions.					
	Conflict management	35	I usually listen to my colleagues, but I do not accept the proposals they offer					
		36	My coworkers' behaviors bother me to such a degree that it makes me uncomfortable to work with them.					
4	Cohesion	37	I am intolerant and incomprehensive towards your co-workers					
		38	I feel part of a work team					
		39	I feel valued and well received by my colleagues					
5	Communication	40	It is common					

			for colleagues to work in isolation					
		41	Communication and interaction with my coworkers is assertive and provides me support					
		42	most communication occurs informally causing misunderstandings					
6	fellowship	43	In daily life, I frequently feel integrated into the various activities					
		44	I usually encourage, support and congratulate my colleagues					
		Four. Five	I usually actively listen to my coworkers					
7	inclusive culture	46	There are the same job opportunities for women as for men.					

			47	The distribution of tasks is according to the capabilities of each person.					
			48	Men and women have the same training opportunities					
	8	House Rules	49	Regardless of ideological differences, there is tolerance among workers					
			fifty	You are free to express what you feel and think without being singled out.					
			51	Among colleagues, do you help each other at work?					

Organizational factors	1	Organizational culture	55	There is a set of clear, ethical and consistent values that govern the way we					

				conduct ourselves and help us distinguish what is right.					
			56	I believe that everyone in our organization has equal access to employment and growth opportunities					
			57	I think the company is transparent with me					
	2	Leadership	58	My immediate boss constantly challenges my talent with ambitious and sufficiently executable tasks.					
			59	The guidance my boss gives me helps me do the job well					
			60	My boss encourages me to do my job better					

3	Training	61	Areas other than techniques are included in the training, such as interpersonal relationships, assertive management of emotions, teamwork and quality.						
		62	I continually receive training that allows me to better carry out my activities.						
		63	In my work area I acquire and develop skills that challenge me						
4	Organizational climate	64	I am satisfied with the degree of communication that exists in my organization since it facilitates the						

			achievement of results.					
		65	My superiors give me the recognition I deserve					
		66	I believe I have opportunities to grow professionally in this company.					
	5	Empowerment	67	I have the possibility to manage (organize) my time					
			68	I can make decisions that allow me to achieve the objectives set by my company					
			69	I must have approval from my immediate boss to make a decision					
	6	Remuneration	70	You receive fair payment for the work you do					
			71	You feel like you have enough paid time off to rest					

			and recharge					
		72	I am worried about being fired or not renewing my contract.					
7	Risks and accidents	73	I can do my work with peace of mind and keep it up to date					
		74	I can leave my work for a moment to talk with a colleague					
		75	In your job, you usually have to keep your emotions to yourself and not express them.					
8	Flexibility	76	I usually attend personal commitments during work hours					
		77	In my area there is flexibility among my colleagues to adopt technological changes.					
		78	My area contributes					

				to an adequate response to consumer requireme nts					
	9	innovatio n and developm ent	79	Have you prepared an innovation proposal in your work area?					
			80	There is a culture of innovation in the organizati on					
			81	An Innovation and developme nt policy has been defined in the organizati on					

Outcome factors	1	goal achievem ent	82	Your job responsibil ities are clearly defined					
			83	You feel you have enough time and resources to get your work done on time					
			84	the objectives you must achieve are clear					

	2	Growth	85	My boss helps me progress at work					
			86	The guidance my boss gives me helps me do my job better					
			87	I have the possibility of promotion according to my abilities and skills					
	3	Furniture and equipment	88	My workspace is comfortable					
			89	I usually ended my work day with some muscle pain.					
			90	I have the minimum equipment to efficiently carry out my work.					
	4	Raw material	91	I have the basic supplies to achieve my goals					
			92	Most of the time I repeat activities due to the quality of the inputs					

		93	Inputs meet specific criteria to be accepted						
5	Technology	94	The tools I use in my work are obsolete						
		95	Technological tools make my work more efficient						
		96	The company systematizes, collects information for appropriate decision making						
6	Standards	97	There are performance criteria that allow me to evaluate my productivity.						
		98	The way they evaluate my work in the company helps me improve						
		99	They inform me about what I should improve in my work						
7	Strategic control	100	There is a correct						

			interaction between the different departments or areas of the company to achieve the objectives					
		101	Communication channels are assertive					
		102	I know the direction the organization is looking for					
8	Lightning	103	The lighting in my work area is adequate for carrying out my activities.					
		104	I usually feel eye strain after my work day.					
		105	The lights produce glare or reflections in some elements of my workplace					
9	Willingness to change	106	I am aware that the changes benefit all					

				staff equally.					
			107	There is management support for organizational change					
			108	I am willing to commit to unforeseen technological changes undertaken by the company					

Source: Own elaboration based on coincident factors from previous research

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