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## **Presentation of Content**

In a first article we present, *Attitude, behavior and financial knowledge of young university students in Mexico*, by DÉCARO-SANTIAGO, Laura Angélica, SORIANO-HERNÁNDEZ, María Guadalupe, DELGADILLO-GÓMEZ, Patricia and RUIZ-REYNOSO, Adriana Mercedes, with adscription in the Universidad Autónoma del Estado de México, in the next article we present, *Panorama on competitiveness, financing capacities and training of personnel in companies of the Food sector dedicated to the production of dairy products in Cajeme, Sonora*, by RUIZ-PEREZ, Roberto, LANDAZURI-AGUILERA, Yara, VALENZUELA-REYNAGA, Rodolfo and MORENO-MILLANES, María Dolores, with adscription in the Instituto Tecnológico de Sonora, in the next article we present, *Organizational performance improvements through the design of internal controls, accounting records and determination of unit production costs in industrial smes of transformation, service and assembly*, by GONZALEZ-NAVARRO, Nora Edith, ACEVES-LÓPEZ Jesús Nereida, NAVARRO-ARVIZU Elba Myriam and CORRAL-CORONADO, Zulema Isabel, with adscription at Instituto Tecnológico de Sonora, in the last article we present, *Evaluation of the degree of social responsibility in micro and small businesses in the food service sector*, by CAMPOS-BRAVO, Carlos Alberto, REYES-RODRÍGUEZ, Mónica Araceli, FERIA-CUEVAS, Yolanda and GÓMEZ-GONZÁLEZ, Martha Sheila, with adscription in Universidad de Guadalajara.

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**Attitude, behavior and financial knowledge of young university students in Mexico****Actitud, comportamiento y conocimiento financiero en jóvenes universitarios en México**

DÉCARO-SANTIAGO, Laura Angélica†, SORIANO-HERNÁNDEZ, María Guadalupe\*, DELGADILLO-GÓMEZ, Patricia and RUIZ-REYNOSO, Adriana Mercedes

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**Abstract**

Financial literacy, which includes the dimensions of attitude, behavior and knowledge, is a condition for individuals to achieve financial well-being. In the population of young university students, it is a relevant aspect since they begin the financial life cycle, with a forecast of medium and high income, but whose generation of wealth will depend on decision making. Therefore, the objective of this paper is to measure the level of financial literacy of students at the Universidad Autónoma del Estado de México, in order to identify areas of opportunity and gaps to address. For which an instrument designed in Ecuador was applied, for the Latin American context, which meets the necessary psychometric levels. The sample consisted of 521 participants from various programs and educational spaces that were close to graduation. Analysis was subject to central and dispersion measures as well as non-parametric group comparison tests. Among the results, it was identified that most students are at a high level of financial literacy, although the lowest score was obtained in the knowledge dimension. Significant differences were found in gender, by educational program, academic space and employment status.

**Financial Knowledge, Financial Behavior, Financial Attitude, Financial Literacy, University students, Comparison**

**Resumen**

La alfabetización financiera, que incluye las dimensiones de actitud, comportamiento y conocimiento, es una condicionante para que los individuos logren alcanzar el bienestar financiero. En la población de jóvenes universitarios resulta un aspecto relevante toda vez que inician el ciclo de vida financiero, con pronóstico de ingresos medios y altos, pero cuya generación de riqueza dependerá de la toma de decisiones. Por lo tanto el objetivo del presente trabajo es medir el nivel de alfabetización financiera de estudiantes de la Universidad Autónoma del Estado de México, con la finalidad de identificar áreas de oportunidad y brechas por atender. Para lo cual se aplicó un instrumento diseñado en Ecuador, para el contexto latinoamericano, que cumple con los niveles psicométricos necesarios. La muestra estuvo conformada por 521 participantes de diversos programas y espacios educativos que estuvieran próximos al egreso. Entre los resultados se identificó que en gran proporción los estudiantes se encuentran en el nivel alto o muy alto de alfabetización financiera, aunque la puntuación más baja se obtuvo en la dimensión de conocimiento. Se encontraron diferencias significativas en género, por programa educativo, espacio académico y estatus laboral.

**Conocimiento Financiero, Comportamiento Financiero, Actitud Financiera, Alfabetización Financiera, Universitarios, Comparación**

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## Introduction

Financial literacy is a necessary skill to cope with life today. At the beginning of this millennium, some economists such as Alan Greenspan identified that financial skills are a key ingredient to develop new economies and create new financial opportunities for all, as cited by Joo and Chatterjee (2012). Gomez-Macfarland (2018) emphasizes that financial literacy enables individuals to take advantage of the benefits of the financial products offered, thus strengthening, financial systems. In other words, financial literacy empowers the consumer of financial products (García, Grifoni, López, & Mejía, 2013; Goyal & Kumar, 2021). Derived from this impact, the intensified interest in measuring, analyzing and generating strategies that improve financial literacy indicators is justified, especially because of its relationship with people's perception of well-being (Aydin & Selcuk, 2019; Hernández-Mejía, García-Santillán, & Moreno-García, 2021; Karakurum-Ozdemir, Kokkizil, & Uysal, 2019; Vieira, Potrich, & Mendes-Da Siva, 2018).

Thus, the Organization for Economic Cooperation and Development (OECD) has been a leader in research to measure the level of financial literacy, mainly with the global application of two instruments: Adult Financial Literacy in G20 countries and Program for International Student Assessment PISA in its financial literacy section. The dimensions of the instrument come from the 2018 OECD/INFE version: Financial Knowledge, Financial Behavior, Financial Attitudes and Financial Inclusion (OECD, 2020a). It is worth noting that some studies identify that financial knowledge and attitude have positive impacts on financial behavior (Vieira et al., 2018).

The second instrument, in the most recent exercise sought to identify what students know about mathematics, science and reading and can do with this knowledge, where the financial aspect is included. Twenty countries participated in this study (OECD, 2020b). Unlike the instrument used by the OECD in adults, the PISA aims to measure the ability of young people to apply knowledge and skills in key areas in order to interpret problems under various financial contexts (OECD, 2019), in this sense, the instrument seeks to answer the question Are students smart about money? (Schleicher, 2019).

Likewise, in 2014, The Standard & Poor's Ratings Services Global Financial Literacy Survey was conducted with the purpose of identifying the degree of understanding of four basic financial concepts (Klapper, Lusardi, & van Oudheusden, 2014). In addition, in Mexico, the National Financial Inclusion Survey (ENIF) was conducted for the fourth time in 2021. This Mexican instrument, in the financial education section, seeks to identify financial behavior, financial knowledge (called financial capability in the document) and freedom in financial decisions.

In the same way, Higher Education Institutions (HEI), through their researchers, contribute to the analysis and development of measurement instruments focused on more specific sectors, in differentiating conditions for their contexts, and also with methodological bases that meet the psychometric requirements that provide robust research.

Thus, the objective of this paper is to present the results of the measurement of financial literacy in university students of the Universidad Autónoma del Estado de México through an instrument developed in Latin America specifically designed for this context and sector. This in order to answer the following questions

RQ1. What level of financial literacy do university students achieve?

RQ2. Is there a significant difference in financial literacy and its dimensions among university students by gender?

RQ3. Is there a significant difference in financial literacy and its dimensions among university students by educational program?

RQ4. Is there a significant difference in financial literacy and its dimensions among university students by academic space?

RQ5. Is there a significant difference in financial literacy and its dimensions among university students by employment status?

The paper, henceforth, is divided into five sections. The first establishes the theoretical and contextual framework that takes up the studies that define and operationalize the construct "Financial Literacy" and the contextualization of the sample studied based on the financial life cycle. Then, the method used is explained, which determines the instrument used to collect the information from the sample and subsequent analysis. It continues with the results section that describes the statistical data obtained, to give way to the discussion session of the results that contrasts with what has already been studied. Finally, the conclusions explain the scope and limitations of this work.

### Financial literacy (AF)

On financial literacy, several works have compiled definitions from other authors. The aim is to identify a universal conceptual definition, which allows a homogeneous operationalization.

In a first antecedent, the definition appears in the United States in 1997 by Jump\$start Coalition for Personal Financial Literacy, as: "the ability to use knowledge and skills to manage one's own financial resources effectively throughout life" (Stolper & Walter, 2017, p. 8).

Later, through the analysis of 71 individual studies published between 1996 and 2008, Huston (2010) concluded, among other points, that there is a weak conceptualization and definition of the financial literacy construct; in the same way as Stolper and Walter (2017).

Huston(2010) emphasized that the measurement of financial literacy is not measuring the degree of information that people have, but the ability and confidence to use that information to make decisions that generate economic well-being. Similarly, Skagerlund, Lind, Strömbäck, Tinghög and Västfjäll (2018) conclude that not only is knowledge of financial concepts important, but even more, the ability to use them to perform basic calculations and make sound decisions for financial well-being. Thus, financial literacy is a broader construct than financial education (Vieira et al., 2018).

Integrating the complexity of time and situations encountered in life Remund (2010, p. 284) proposes that "Financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate short-term decision making and sound long-term financial planning, taking into account life events and changing economic conditions."

In addition, various institutions and organizations built their definition on the understanding that financial literacy goes beyond an inventory of knowledge, skills and behaviors, focusing on the awareness of these and the confidence to use them to make more accurate decisions aimed at financial wellbeing, as shown in Table 1.

Institution	Conceptualization of Financial Literacy
ASIC (2011, p. 4)	"is about understanding money, finances and being able to apply that knowledge to make effective financial decisions."
Atkinson & Messy (2012, p. 14) OCDE	"A combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being"
Klapper et al. (2014, p. 4) S&P	"..ability to make financial decisions regarding saving, investing, borrowing and more."
CONAIF (2017, p. 195)	"Combination of awareness, knowledge, skills, abilities, and behaviors necessary to make financial decisions"
OCDE (2019, p. 18)	"It is the knowledge and understanding of financial concepts and risks, as well as the skills and attitudes to apply such knowledge and understanding to make effective decisions in a variety of financial contexts, to improve"

**Table 1** Institutional definitions on Financial Literacy  
*Source: Own elaboration*

Although, through an agglutination of published works, Vieira et al. (2018) concludes that various authors measure financial literacy only with financial knowledge using it as a synonym, this view is limited

Meanwhile, research in the last decade points out that financial literacy is a construct measured through the dimensions of attitude, knowledge and financial behavior. Méndez Prado et al. (2022) review 45 definitions of financial literacy published between 2010 and 2021, to identify that the total consider financial knowledge as a dimension of financial literacy, 36 add behavior and 19 include the previous dimensions, plus financial attitude. For their part, with the bibliometric review Goyal & Kumar (2021) find the consistency of previous studies (507 studies) in that the three dimensions are not only interrelated with financial literacy, but also with each other.

### Financial life cycle of young college students

This financial well-being is modified by the stage of life through which the individual passes, marked by a financial life cycle. The cycle is composed of three stages: accumulation, consolidation and protection. The objectives of each stage are different, as are the skills and knowledge required to achieve them. The main objective of the first stage, according to Garay Anaya (2015), is to achieve the main goals of the individual such as the acquisition of assets, business projects and the formation of a family along with the satisfaction of their needs. It is at this stage that there is greater consumption and purchasing power. The relationship between the biological and financial life cycle was also taken up in the research of Allgood and Walstad (2013) whose determination was five generations: (18-29; 30-39; 40-49; 50-59; and 60-69 and over 69).

For his part, Zacari (2008) exposes the relationship of human capital with the financial life cycle. Human capital is transformed or monetized throughout the individual's life, becoming financial capital.

Having said this, we can typify the university student as the subject who is in the first generation of adults, whose transition to the stage of accumulation becomes latent and due to his condition in the investment of human capital makes him a potential generator of financial capital. Being in this almost invisible line of entry to its financial cycle, this sector presents the following characteristics:

- University students are in the conversion from a state of economic dependence to independence of livelihood and therefore of decisions. This sector of the population is almost ready to start generating income. Thus, they begin to abandon parental supervision to manage their own financial affairs (Aydin & Selcuk, 2019).
- They are developing human capital to convert it into financial capital in the short to medium term. Unlike other types of workers, university students have academic preparation, although little or no professional experience. In any case, most of them will earn medium-high incomes in the short to medium term. Students more advanced in their educational programs have higher levels of knowledge, Aydin & Selcuk (2019) suggest that it is because the soon-to-be graduates have more motivation to learn about such topics because of their proximity to financial independence.
- When they reach the age of majority, they will be open to apply for any product and/or formal financial product, such as credit. Some topics become more relevant because of the stage of the life cycle of college students. For example, payment behaviors are preliminary in college students, while debt behaviors are more advanced (Xiao, Ahn, Serido, & Shim, 2014).
- This sector is still related on a daily basis to the educational institution, so they are at a crucial moment to develop and strengthen their financial literacy. Kaiser and Menkhoff (2017) point out that financial education at a teaching moment is crucial to improve financial knowledge and awareness. In addition to the fact that the habits acquired in these years persistently affect their economic life cycle (Aydin & Selcuk, 2019).

## Methodology

### *The measurement instrument.*

There are instruments designed and applied by formal bodies such as the OECD and the ENIF, but their main objective is only to obtain a descriptive overview, i.e., they do not offer parameters that allow weighting the level of financial literacy. Some global studies such as the one developed by S&P's Ratings Services focus only on the understanding of certain concepts (risk diversification, inflation, arithmetic and compound interest) (Klapper et al., 2014). Others have been developed by in developed country contexts, far from the Latin reality or aimed at the adult population in general.

Thus, the instrument developed by Méndez Prado et al. (2022) was chosen for a Latin American context and aimed at young adults whose purpose is to measure financial literacy from a key decision making approach through the dimensions of Financial Attitude (A), Financial Behavior (CM) and Financial Knowledge (C). The instrument was validated with a sample of 478 young Ecuadorians.

The instrument was subjected to Correlation Analysis, Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) tests to validate the underlying theoretical construct. The Cronbach's alpha reached  $\alpha = 0.855$ . Regarding the SEM indicators, the authors obtained: Chi-square/Grades of freedom,  $\chi^2/pdf=2.08$ ; Goodness of fit index, GFI= 0.959; Comparative fit index CFI= 0.952; Mean square error of approximation, RMSEA= 0.059. All from model number 2 (CM~C; A~C; A~C; A~CM).

The instrument developed by the authors contemplate the three dimensions of financial literacy establishing the following definitions taken from other works (Chaulagain, 2015; Lusardi, 2015; Vieira et al., 2018):

Financial Knowledge (C). "Ability to assimilate and understand economic and financial processes to make correct decisions about financial planning, budgets, loans and other issues" (Méndez Prado et al., 2022, p. 3).

Financial Behavior (CM). "Reflects the skills and actions to achieve short- and long-term financial objectives that can be acquisitive or cover unexpected expenses." (Méndez Prado et al., 2022, p. 3)

Financial Attitude A. "How an individual perceives and judges financial issues and nurtures intentions regarding money" (Méndez Prado et al., 2022, p. 3).

The instrument is made up of 41 items. The Attitude (A) factor with 17 items (9 with inverse treatment). The Behavior factor (CM) with 13 items. Both on a Likert scale 1-5. The Knowledge factor (C) with 11 items with dichotomous response analysis (1=correct, 0=incorrect).

### *Sample and data collection*

The instrument was self-administered through the Surveyplanet platform to a total of 616 students from three University Centers of the Autonomous University of the State of Mexico (Ecatepec, Valley of Mexico and Zumpango), during the months of March and April 2023. Sample by convenience and voluntary participation.

Groups	Description
Age	Max= 40 Mín=20 $\bar{x}$ = 21.92 DE=2.021
Female	n= 349 (67.0%)
Male	n=172 (33.0%)
B.A. in Administration LA	n=120 (23.0%)
Bachelor of Accounting LC	n= 64 (12.3%)
Bachelor in Law LD	n= 106 (20.3%)
Bachelor's Degree in Tourism LT	n= 49 (9.4%)
Bachelor's Degree in Psychology LPS	n= 88 (16.9%)
B.S. in Computer Science LIA	n= 75 (14.4%)
B.S. in Actuarial Science LAC	n=19 (3.6%)
Works formally	n=37 (7.1%)
Works informally	n=224 (43.0%)
CU Ecatepec	n=96 (18.4%)
CU Valle de Mexico	n= 79 (15.2%)
CU Zumpango	n= 346 (66.4%)
Does not work	n=260 (49.9%)
Works informally	n=224 (42.9%)
Works formally	N=37 (7.10%)

**Table 2** Descriptive of the sample  
Source: Own elaboration

Of the total number of responses obtained, 95 participants were discarded because they did not pass the commitment criteria in the answering process. These criteria were as follows:

1. Participant who selects the same answer in all items ( $\bar{x} = 0$ ), is discarded.
2. Participant who takes less than the average time minus one standard deviation (0 h 6 min 49 s, minimum), is discarded.

Thus, only 521 participants will be considered for the analysis, whose characteristics are shown in Table 2.

### The analysis

The results of the 521 participants were subjected to descriptive and inferential statistical analysis with the help of SPSS software. For the descriptive analysis, the central measures were used: mean and median; while for dispersion, the standard deviation and range were used.

Regarding group analysis, the Kolmogorov-Smirnov normality test was first applied to the metric variables. Due to the result, the Mann-Whitney U test was used (accompanied by the Hedges g to measure the effect size) and the Kruskal-Wallis test; in addition to the post hoc analysis with the Games Howell test.

The tests to determine the difference between groups were used on the total obtained from A, CM and C; while for Financial Literacy it was applied to the result from equation 1, which was proposed in the work of Méndez Prado et al. (2022).

$$FL = (0.34*FA) + (0.30*FB) + (0.36*FK) \quad (1)$$

It should be noted that Méndez Prado et al. (2022) also presented five levels of financial literacy based on the results achieved in the three dimensions, as shown in Table 3.

Level	Score
Very High	80-100
High	60-80
Average	40-60
Low	20-40
Very Low	0-20

**Table 3** Descriptive of the sample. Level of financial literacy

Source: (Méndez Prado et al., 2022)

## Results

The reliability results of the instrument are satisfactory in AF, A, CM and C ( $\alpha = .817$ ,  $\alpha = .814$ ,  $\alpha = .843$  and  $\alpha = .607$ ; respectively).

Beginning with the descriptive analysis of each of the items of dimensions A, CM, C (see Table 4), it is detected that in dimension A, the highest weighted items are: AF13.A13. The importance of saving ( $\bar{x} = 4.39$  SD= 0.903), AF4.A4. Disability contingency plan ( $\bar{x} = 4.31$  SD= 0.934); while the lowest were: AF8.A8. Planning for old age ( $\bar{x} = 3.54$  SD=1.340) and AF12.A12. Investing time in financial records ( $\bar{x} = 3.56$  SD= 0.953).

Meanwhile, for the CM dimension, the items with the highest scores were: AF26.CM9. Paying debts on time ( $\bar{x} = 4.55$  SD=0.788) and AF23.CM6. Paying bills on time ( $\bar{x} = 4.41$  SD= 0.864). In contrast, AF29.CM12. Financial reserve for unexpected circumstances ( $\bar{x} = 2.76$  SD=1.260) and AF18.CM1. Controlling expenses in a written manner ( $\bar{x} = 2.73$  SD=1.069).

Finally, for the C dimension, AF36.C6. Cost of debt by term ( $\bar{x} = 0.80$  SD=0.402) and AF33.C3. Use of discount ( $\bar{x} = 0.79$  SD=0.402) reached the highest value, on the contrary, AF32.C2. Interest rate calculation ( $\bar{x} = 0.36$  SD=0.480) and AF41.C11. Fixed vs. variable rate ( $\bar{x} = 0.14$  SD=0.351) resulted with the lowest scores.

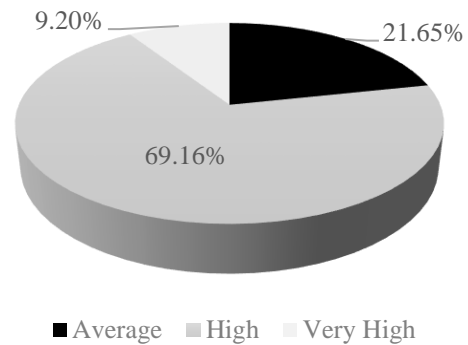
It is relevant to highlight that the mean and median of A ( $\bar{x} = 67.31$  SD=8.570; Mdn=68 Rank=45 ) was higher than the mean of CM ( $\bar{x} = 48.20$  SD=8.107; Mdn=49 Rank=52).

Item/Dimension/Construct	Min	Max	Mdn	Rgo	$\bar{x}$	DE
AF1.A1. Develop a regular savings pattern	1	5	4	4	3.93	1.242
AF2.A2. Written financial goals to prioritize spending	1	5	4	4	4.14	1.031
AF3.A3. Written budget for financial management	1	5	4	4	3.98	0.922
AF4.A4. Disability contingency plan	1	5	5	4	4.31	0.934
AF5.A5. Expense planning	1	5	4	4	4.24	0.912
AF6.A6. Future planning	1	5	4	4	4.13	0.896
AF7.A7. Financial statement in 5 or 10 years	1	5	4	4	3.97	0.912
AF8.A8*. Planning for old age	1	5	4	4	3.54	1.340
AF9.A9*. Financial plan for decision making	1	5	4	4	3.61	1.071
AF10.A10*.Saving plan to meet the needs AF11.	1	5	4	4	3.86	1.087
AF11.A11*.The need for planning AF12.	1	5	4	4	3.75	1.060
AF12.A12*.The investment of time in financial records AF13.	1	5	4	4	3.56	0.953
AF13.A13*. The importance of saving	1	5	5	4	4.39	0.903
AF14.A14*.The Time of Debt	1	5	4	4	3.97	1.055
AF15.A15*.Alignme nt of plans based on life stage AF16.	1	5	4	4	3.78	1.012
AF16.A16. Life changes and financial plans	1	5	4	4	4.25	0.761
AF17.A17*. The integral theme of financial planning	1	5	4	4	3.90	0.825
Financial Attitude (A)	40	85	68	45	67.31	8.570
AF18.CM1. Controlling Expenses in a Written Manner AF19.	1	5	3	4	2.73	1.069
AF19.CM2. Comparison of Prices	1	5	4	4	4.15	0.974
AF20.CM3. Saving from monthly income	1	5	3	4	3.69	1.130
AF21.CM4. Spending Plan	1	5	3	4	3.28	1.154
AF22.CM5. Competence in personal finance	1	5	3	4	3.42	1.026
AF23.CM6. Paying bills on time	1	5	5	4	4.41	0.864
AF24.CM7. Monthly savings	1	5	3	4	3.65	1.104
AF25.CM8. Analyzing the financial situation before a major purchase AF26.	1	5	5	4	4.27	0.967
AF26.CM9. Paying debts on time	1	5	5	4	4.55	0.788
AF27.CM10. Saving to achieve long-term goals	1	5	3	4	3.72	1.074
AF28.CM11. Increasing savings based on income growth	1	5	4	4	3.98	1.099
AF29.CM12. Financial reserves for unexpected circumstances	1	5	3	4	2.76	1.260
AF30.CM13. Savings in the last 12 months	1	5	3	4	3.60	1.158
Financial Behavior (CM)	13	65	49	52	48.20	8.107
AF31.C1. Effect of Inflation	0	1	1	1	0.56	0.497
AF32.C2. Interest Rate Calculation	0	1	0	1	0.36	0.480
AF33.C3. Use of Discounting	0	1	1	1	0.79	0.411
AF34.C4. Time Value of Money	0	1	1	1	0.64	0.479
AF35.C5. Comparison of annuity with different terms	0	1	0	1	0.38	0.486
AF36.C6. Cost of Debt by Term	0	1	1	1	0.80	0.402
AF37.C7. Diversification	0	1	0	1	0.40	0.490
AF38.C8. Cost of debt by maturity (comparative)	0	1	1	1	0.55	0.497
AF39.C9. Identification of equity	0	1	0	1	0.41	0.492

AF40.C10. Capital credit	0	1	1	1	0.55	0.498
AF41.C11. Fixed vs. variable rate	0	1	0	1	0.14	0.351
Financial Literacy (C)	.00	11.00	6	11	5.5854	2.30236
Financial Literacy (AF)	71	157	121	86	121.090	12.954

**Table 2** Level of knowledge of CBFP by item  
Source: Own elaboration

Applying eq. (1) identifies the mean Financial Literacy in the sample is 67.44 (FL = (0.34\*79.1825) + (0.30\*74.1532) + (0.36\*50.7764)). Thus, the distribution of the financial literacy level is observed in Figure 1.



**Figure 1** AF level of the sample  
Source: Own elaboration

Gender showed statistically significant differences in A, where the scores of women (Mdn=68; Range=45) is higher than that of men (Mdn= 66; Range =42) U= 24973.00; p=.001; Heges= 0.331570, as can be seen in Table 5.

	Female (n=349)	Male (n=172)	U	p	g of Hedges
A	68 (45)	66 (43)	24873.00	.001	0.331570
CM	47 (41)	50 (52)	26624.00	.036	0.165645
C	6 (11)	6 (11)	24908.00	.001	0.297824
AF	121(72)	121(86)	29286.50	.652	0.061286

**Table 5** Comparison between PA dimensions and gender  
Source: Own elaboration

Likewise, with CM, where, on the contrary, the scores of women (Mdn=47; Range= 41) lower than that of men (Mdn= 50; Range =52) U= 26624.00; p=.036; Heges= 0.165645 (Note Table 5).

Through the medians shown in Table 5 no gender difference is identified, with respect to C, however, through the mean it is observed that males ( $\bar{x}$ = 6.0407, SD=2.4215) have a higher score than females ( $\bar{x}$ = 5.3610, SD=2.2105), U= 24908.00; p=.001; Heges= 0.297824.

	A	CM	C	AF
LA (n= 120)	69 (43)	50 (34)	6 (11)	122 (57)
LC (n=64)	71 (36)	48 (39)	7 (10)	126 (65)
LD (n=106)	66.5 (43)	51 (52)	5.5 (11)	121 (81)
LT (n=49)	69 (32)	47 (38)	5 (10)	121 (66)
LPS (n=88)	68.5 (40)	45 (37)	5 (9)	120 (55)
LIA (n=75)	64 (37)	49 (37)	5 (9)	119 (54)
LAC (n=19)	70 (29)	49 (26)	6 (6)	125 (43)
<i>H de K</i>	20.579	26.212	46.388	29287
<i>p</i>	0.002	<.001	<.001	0.004

**Table 6** Comparison between AF dimensions and education

Source: Own elaboration

The Kruskal Wallis test indicated the difference between the groups by profession (Bachelor in Administration LA, Accounting LC, Law LD, Tourism LT, Psychology LPS, Administrative Informatics LIA and Actuary LAC) of the three dimensions. As identified in Table 6.

The post hoc analysis through the Games Howell test exposed that LC students (Mdn=71) scored higher than those belonging to the LIA Program (Mdn=64  $p=0.016$ ) 95% CI [0.57, 9.33]. In turn, LPS students (Mdn=68.5) also score higher than LIA participants (Mdn=64  $p=0.016$ ) 95% CI [0.64, 8.48]. This is in the Financial Attitude dimension.

Regarding CM, students in the LPS program (Mdn=45) scored lower than students in: LA (Mdn=50  $p<0.000$ ) 95% CI [2.19, 8.09], LC (Mdn=71  $p=0.035$ ) 95% CI [0.17, 7.82], LD (Mdn=51  $p=0.009$ ) 95% CI [2.19, 8.09] and LIA (Mdn=49  $p<0.046$ ) 95% CI [0.03, 6.61].

In dimension C, the score of LA (Mdn=6) and LC (Mdn=7) students is higher than: LD students (Mdn=5.5  $p=0.002$ ) 95% CI [0.3431, 2.3133] and (Mdn=5.5  $p<0.000$ ) 95% CI [0.7824, 2.9688], respectively; than LT students (Mdn=5  $p=0.022$ ) 95% CI [10.38, 2.2812] and (Mdn=5  $p<0.000$ ) 95% CI [55.53, 2.9255], respectively; that LPS students (Mdn=5  $p<0.000$ ) 95% CI [0.3172, 2.0586] and (Mdn=5  $p<0.000$ ) 95% CI [0.7423, 2.7293] respectively and that LIA students (Mdn=5  $p=0.022$ ) 95% CI [0.851, 1.8749] and (Mdn=5  $p<0.000$ ) 95% CI [0.5138, 2.5421], respectively.

Also, the Kruskal Wallis test presents significant difference in the dimension of A and CM, between the groups of students with academic space ascription.  $H(2)=12.209$ .  $p=.002$  and  $H(2)=9.682$   $p=.008$ , respectively, as shown in Table 7. Applying the post hoc analysis, students from Zumpango (Mdn= 68.5) have a higher score, in dimension A, than students from Ecatepec (Mdn=65  $p=0.006$ ) 95% CI [0.76, 5.60].

On the other hand, students from Valle de México (Mdn= 51) out score Zumpango (Mdn=48  $p=0.001$ ) 95% CI [1.13, 5.62] in the CM dimension.

	CU Ecatepec (n=96)	CU Valle de Méx. (n=79)	CU Zumpango (n=346)	<i>H of K</i>	<i>p</i>
	Mdn (Range)				
A	65 (44)	67 (38)	68.5 (43)	65 (44)	.002
CM	47.5 (40)	51 (30)	48 (52)	47.5(40)	.008
C	5 (9)	6 (8)	6 (11)	5 (9)	.058
AF	118 (63)	122 (62)	122 (86)	118 (63)	.059

**Table 7** Comparison between AF dimensions and space of ascription

Source: Own elaboration

As shown in Table 8, there is only a difference in the CM dimension, by work activity  $H(2)= 12.562$ .  $p=.002$ . The CM is found to be lower in those who do not work (Mdn=47).

	Formal work (n=37)	Informal work (n=224)	Not working (n=260)	<i>H of K</i>	<i>p</i>
	Mdn (Range)				
A	70 (36)	68 (43)	68 (45)	1.991	.370
CM	51 (30)	51 (52)	47 (38)	12.562	.002
C	6 (11)	6 (11)	6 (11)	5.322	.070
AF	128(59)	122 (81)	120(72)	5.223	.073

**Table 8** Comparison between AF dimensions and work activity

Source: Own elaboration

Adding the post hoc analysis through the Games Hollew test yields that students who do not work (Mdn=47) score lower than students who work informally (Mdn=51  $p=0.038$ ) 95% CI [0.80, 3.55] (refer to Table 8).

## Discussion

The FA of the sample of university students is higher than that of the general Mexican population (CNBV, 2022; INCyTU, 2018). The results expose that 78.36% of the students in this sample are at a high or very high AF level. This fact supports the issue that AF improves as the educational level increases (CNBV, 2022).



Klapper et al. (2014) identify that in emerging economies young people between 15 and 35 years old present higher levels of AF than adults in the following stages (consider that the authors limit the measurement of literacy with four knowledge questions). It is worth noting that this knowledge will improve over time since Hernández-Mejía et al. (2021), through the ENIF results, find that knowledge behaves as an inverted U with age (age ranges 15-24, 25-34, 35-44, 45-54).

Proportionally, A obtains the best result, followed by CM, leaving C on the last rung. Part of the reasons that may explain this result is that, unlike CM and A, C is made up of evaluation questions.

The items with the lowest scores are related to calculating the simple interest rate and making a decision regarding the type of rate (fixed or variable) and predicting a future scenario.

In line with the general population that understands the concepts of diversification, inflation and interest, but is more deficient in the calculation of interest rates (CNBV, 2022), the sample shows the same trend. Somehow it is made to glimpse that the mathematical aspect is not entrenched, a weakness that has been dragged from the upper secondary level, since the PISA results reveal that 56% of Mexican young people are at the lowest level in the mathematical evaluation (OECD, 2018).

Regarding decision making among interest rates, it is important to identify that not only knowledge is necessary among university students but also application in decision making, as explained by Osorno Morales and Hernández Rivera (2021).

While the highest items achieved by the participants, which are related to A, point to the importance of saving and having a contingency plan in case of disability of a family member who supports financially. In practice, it seems that this remains more in intention than in fact (a statement that is confirmed later), since according to the ENIF 2021, the population with a higher level of education prefers to spend money rather than save it compared to other educational groups. Likewise, Montoya Gómez et al. (2016) find that young university students tend to the intention to save, only a small percentage carry it out adequately.

About the contingency plan, despite the fact that students consider it fundamental, in fact through the item of C (one of the lowest score items said dimension) students do not have a financial reserve for unexpected circumstances. Evidence shows that only 18% of Mexicans would have resources to cover their needs for three months in case of an eventuality (CNBV, 2022).

Continuing with the discussion, the item related to the importance of investing time to record financial matters (from the A dimension) and the behavior of keeping expense records in writing (from the CM dimension), are the lowest scoring items in their respective dimensions. Thus, both what they think and what they do, in an undesirable way, are aligned. And this trend is reflected in the results of the ENIF 2021 survey, since 2 out of 10 people make a budget and 4 out of 10 register their debts (CNBV, 2022).

The behavior of paying bills and debt on time represents a good indicator in university students, appearing to be influenced by knowledge, since according to Xiao et al. (2014) knowledge reduces risky payment behaviors.

Regarding the analysis of differences between groups. It was observed that there is a significant difference in the three dimensions by gender, where the score of A in women is higher than that of men; while for the dimensions of C (with its reservations) and CM men obtained a better score.

Klapper et al. (2014) describe that women score lower in knowledge regardless of whether they belong to a developed or developing country. However, Aydin and Selcuk (2019) state that there is no significant difference between knowledge by gender; likewise Karakurum-Ozdemir et al. (2019) (results obtained for Mexico). The possibility of this lack of difference may be in line with the sample results, that although there is significance, there is no gap in the median (indicator for non-parametric samples). In contrast to the results found in the sample, regarding behavior, according to Xiao et al (2014) men incur more risky payment and indebtedness behaviors. Specifically in the use of credit cards, women pay the full amount monthly so as not to generate interest (64.4% over 61.47%) (Hernández-Mejía et al., 2021).

Concerning the educational program, on the A dimension, LIA students obtained the lowest scores. In the behavior dimension, LSP obtained the lowest scores. While in knowledge, the highest scores are in LC and LA. Identifying heterogeneity among the results of each program, visualizing that the programs within the economic-administrative area have better scores.

Continuing with the differences found by academic space, students from Zumpango surpass students from Ecatepec in A scores, although they are surpassed by students from Valle de México in CM. This suggests that there are other environmental variables that influence the AF dimensions of the students, such as the level of urbanism of the municipality, the proximity to the metropolis, the presence of industry and the socioeconomic level of the entity. These variables will provide the basis for further research.

Finally, the employment status of the participants. Hernández Rivera (2019) do not find a significant difference between the C of those who work and those who do not, in the same way as the results of this study, since significance is only detected in CM, where the lowest score is obtained by students who do not work. It is worth noting that young people with their own income begin to experiment earlier with financial products, including credit cards (the most widely used formal debt product by Mexicans (CNBV, 2022)). As cardholders, they are more financially literate than the general population (Hernández-Mejía et al., 2021). Also consider that the greater the economic independence, the greater the interest in becoming financially literate (Aydin & Selcuk, 2019).

## Conclusions

University students show results above the average obtained by the Mexican population, however, it is necessary to generate strategies that allow strengthening the study programs in favor of decision-making. In terms of knowledge, it is essential to improve the exercise of calculus and to understand how it is useful when making decisions. Likewise, it is necessary to develop mechanisms that allow the transfer of conceptual theoretical knowledge to the solution of problems under different scenarios.

In the same way, that positive perceptions become desirable actions to achieve wealth and financial wellbeing.

The work offers evidence on the application of an instrument generated in Latin America that satisfactorily fulfills the psychometric indicators, and that takes into account the environment for a specific group that begins its maturity in the financial life cycle. Valuing the exercise of other researchers who seek to propose with scientific rigor.

The results shed light on future research questions that help to explain the level of Financial Literacy and its dimensions as well as the correlation between each one of them, transferring it to other student samples in our Continent.

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## Panorama on competitiveness, financing capacities and training of personnel in companies of the Food sector dedicated to the production of dairy products in Cajeme, Sonora

### Panorama sobre competitividad, las capacidades de financiamiento y capacitación del personal en empresas del sector Alimentos dedicadas a la producción de productos lácteos en Cajeme, Sonora

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#### Abstract

Objective. The objective of this research is to visualize the panorama on competitiveness, the financing capacities and training of personnel in companies in the food sector dedicated to the production of dairy products in the municipality of Cajeme for the detection of areas of opportunity that increase their possibilities of permanence in the market.

Methodology. The research to be carried out is of a mixed nature, that is, it requires descriptive statistics for the qualitative results and inferential statistics for the correlation of the variables. The structural equations method is used with the SMART PLS4 software. The independent variables (financing capacities and personnel training) and the dependent variable (competitiveness) are established. The instrument used was adapted from the INEGI 2018 National Survey on Productivity and Competitiveness of Companies.

Contribution. Statistically significant evidence was found that access to financing and receiving training to improve staff performance increase the competitiveness of companies. The variable of access to financing being more significant than that of training.

#### Competitiveness, Financing Capacities, Training

#### Resumen

Objetivo. El objetivo de esta investigación visualizar cual es el panorama sobre competitividad, las capacidades de financiamiento y capacitación del personal en empresas del sector alimentos dedicadas a la producción de productos lácteos en el municipio de Cajeme para la detección de áreas de oportunidad que incrementen sus posibilidades de permanencia en el mercado.

Metodología. La investigación a realizar es de carácter mixto, es decir requiere de estadística descriptiva para los resultados cualitativos e inferencial para la correlación de las variables. Se utiliza el método de ecuaciones estructurales con el software de SMART PLS4. Se establecen las variables independientes (capacidades de financiamiento y capacitación del personal) y la variable dependiente (competitividad). El instrumento utilizado fue adaptado de la Encuesta Nacional sobre la Productividad y Competitividad de las Empresas del INEGI 2018.

Contribución. Se encontró evidencia estadísticamente significativa sobre que el acceso a financiamientos y el recibir capacitaciones para mejorar el desempeño del personal incrementan la competitividad de las empresas. Resultando la variable de acceso a financiamiento más significativa que la de capacitación.

#### Competitividad, Capacidades de Financiamiento, Capacitación

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## Introduction

Derived from the financial uncertainty with which the average Mexican entrepreneur operates (Hernandez and Jimenez, 2018), rooted in different ways in which they carry out the operation of their (family) businesses, it is necessary to create spaces for research that facilitate their decision-making, that is, to generate information that allows them to lessen the damage of uncertainty. This is why this proposal aims to apply an instrument on competitiveness, financing capacities and personnel performance in food sector companies dedicated to the production of dairy products in the municipalities of Cajeme in order to detect areas of opportunity that will increase their chances of remaining in the market in the medium and long term.

In publications by Álvarez, M. (2009) in the preparation of the report for the Economic Commission for Latin America and the Caribbean (ECLAC) on Micro, small and medium-sized enterprises (MSMEs), it is mentioned that this type of organisation constitutes 90% of the business structure and has a contribution to GDP that ranges from 20% to 50%. Likewise, they stimulate capacities, increase employment possibilities and favour the conditions to achieve a reduction in the social backwardness generated by poverty.

Similarly, in research conducted by Orueta, Echagüe, Bazerque, Correa, García, García and Rodríguez (2019) found that particularly in Latin America, small and medium-sized enterprises contribute around fifty percent of the Gross Domestic Product; of the one hundred percent of existing companies, around ninety percent belong to this category. In terms of employment, it is estimated that they employ between fifty and seventy-five percent of the total number of employees.

The central problem of the research is to determine to what extent the competitiveness of the enterprises (micro, small and medium-sized) is affected by the performance of the personnel and the financing capacities.

This problem has been addressed by different authors who mention that training staff, obtaining financing (level of financing) but with knowledge of its management, information systems, continuous improvement, have increased the profitability of the business, influencing sustained growth and competitiveness (Siccha, 2017; Luciani and Navarro, 2018; Coz, 2019).

This is why it arises from the need to link academia with the productive and public sectors, in order to address the needs that afflict them. This problem has been raised by the National Strategic Programmes (CONACYT, n.d.). In the same way, the aim is to increase the possibilities of success through key variables within the organisation. As a member of the university community, it is a social responsibility to contribute with actions that facilitate the systematisation of knowledge in order to subsequently move on to its implementation (Ruiz, Mellado and Landazuri, 2021).

Based on the previous paragraph, the following hypotheses are to be tested:

H1 Financing capabilities in micro and small enterprises positively impact competitiveness.

H2 Staff training in micro and small enterprises has a positive impact on competitiveness.

This is why the following general objective of the research is elaborated: To determine to what extent the financing and personnel training capacities of companies in the food sector dedicated to the production of dairy products in the municipality of Cajeme have an impact on competitiveness, in order to detect areas of opportunity that increase their possibilities of remaining in the market.

The structure of this article is divided into six sections. The first section begins with an introduction, presenting the background, the problems identified, the hypotheses to be tested and the objective to be achieved through the development of the research. In section two, the theoretical framework is developed, in this section the study variables and the theoretical underpinning that supports it are presented.

The research methodology is presented in section three. The subjects of the study, the design of the instrument, the methodology used to test the hypotheses are established. Section four presents the main results obtained, and then proceeds to section five: the conclusions. This section shows the main inferences obtained through the proposed model and finally, the bibliographical references used in the development of the article are listed.

### Theoretical framework

For the present research, three variables were detected, which will be the object of study. Firstly, the independent variable X1 Financing Capacities: this variable is related to how organisations have structured their financial information in order to be eligible for credit. Since formal financial institutions ask for certain requirements to be eligible for credit, micro and small enterprises have to have verifiable information on their performance in order to be eligible for different formal financing options.

In publications by Valles (2021), he mentions that the main requirements to be eligible for credit are the following: registration with the Tax Administration Service, incorporation certificate, tax identification card, at least six years of invoicing, Confidential Electronic Identification Code, official identification, favourable credit bureau record, proof of address and, above all, various financial statements to prove the economic solvency of the organisation.

In research conducted by Gutierrez (2019), he mentions that although Mexico has modernised its banking system, there is a paradox regarding the exclusion of lower-income sectors, since the beneficiaries have been mainly large corporations. From this, it can be inferred that there is a gap in which small and medium-sized entrepreneurs are not subject to credit and have to resort to different credit options (family, friends, informality, among others).

The second independent variable is X2 staff training. According to Changuán (2020), he mentions that this construct becomes one of the pillars for the organisation, since qualified personnel generate a greater bond of commitment; they also offer, through their own experiences, proposals for improvements to the services they offer, "know how" of the activities they carry out, thereby raising the levels of innovation and competitiveness, which are attributes that are increasingly appreciated in economic environments.

Likewise, Bohórquez, Caro and Morales (2017) point out that trained personnel significantly reduce several of the errors that are made in the production and sale of products and services, thereby mitigating the main operational failures. Also, Bonilla, Macero and Mora (2018) have alluded that staff with little training substantially affect the organisational climate, in addition to the obsolescence of carrying out processes or the lack of orientation produces a lower competitiveness in the entities.

Continuing with the variables, the third Y1 Competitiveness is presented. Nowadays, organisations face increasingly complex market conditions, having to stand out with differentiators over the rest of the competitors. The Mexican Government website (2023) mentions that competitiveness can be defined as the relationship that exists between the income received by one organisation with respect to another. Variables such as economic growth generated, job creation and investment promotion can also be incorporated, depending on the perspective being sought.

In publications by Acosta-Medina, Plata-Gómez, Puentes-Garzón and Torres-Barreto, (2019) mention that business competitiveness is the ability of organisations to achieve an increase or consolidation in the market, so that they have to develop the particular attributes of the services they offer to achieve significant differentiators. For this reason, Silva, Barrientos and Díaz (2010) point out that communication strategies must be assertive in order to increase business competitiveness.

**Methodology**

The research to be carried out is of a mixed type; descriptive statistics will be used to characterise the phenomenon and inferential statistics will be used to make correlations between variables and predict possible behaviours. Similarly, the quantitative approach will be used for the collection and schematization of the information, as well as the qualitative approach to determine the characterisation of the subjects under study.

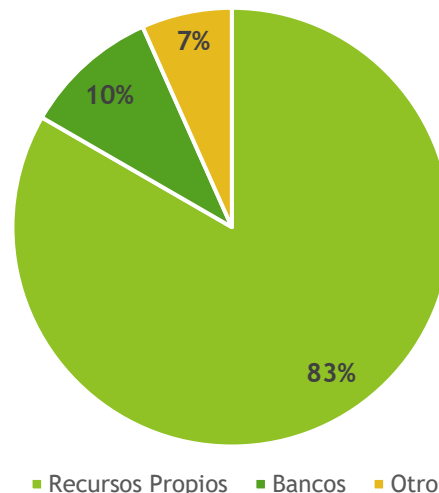
To access the information, an instrument was designed based on the National Survey on Productivity and Competitiveness of Enterprises (ENAPROCE, 2018) and for the calculation of the sample, the population data provided by the National Institute of Statistics and Geography through the National Statistical Directory of Economic Units (DENUE, 2022) will be used.

For data processing, SPSS and SAMRTPLS4 were used to determine the content validity criteria, as well as the correlations and significance of the variables.

The subjects of the study will be companies in the dairy food sector in the municipalities of Cajeme that have between 0 and 10 employees in their hiring schemes. Likewise, the database of the National Statistical Directory of Economic Units (DENUE, 2022) will be considered as input. This database includes 41 organisations that meet these characteristics (it should be noted that at the time of the survey some companies were no longer in force and it was decided to survey others with similar characteristics). Of the total population, a response rate of 73% was achieved, i.e. 30 companies.

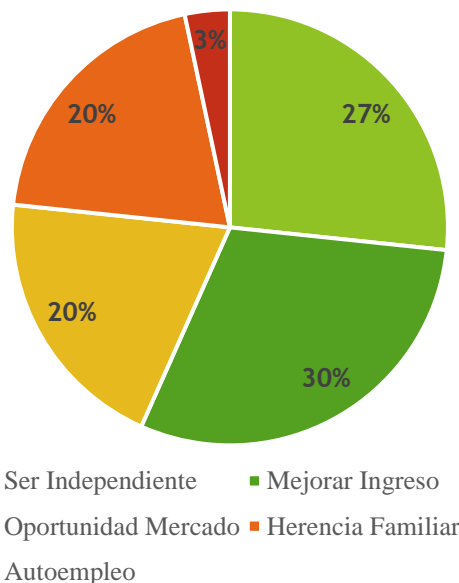
**Results**

In terms of descriptive statistics, it was found that 87% are registered as natural persons and the rest as legal entities. Regarding the start of operations, it was found that the longest-lived company started in 1961 and the most recent was in 2020. The year in which the most companies of this type were opened was 2016. Graph 1 shows that most of the entrepreneurs obtained their resources to start operations through their own resources or support from family members:



**Graphic 1** Obtaining resources  
Source: Own elaboration, 2023

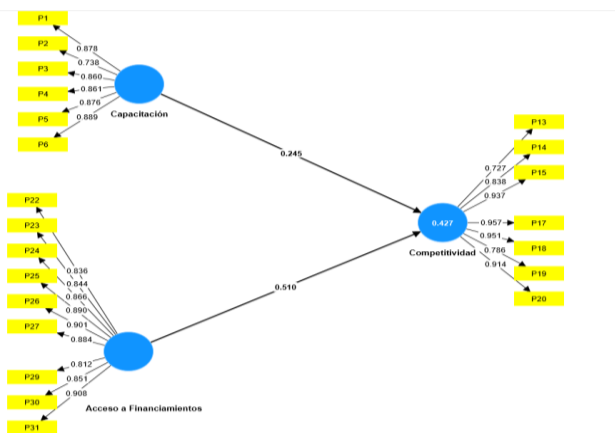
With regard to the motivation for starting the business, the following was found: most of the respondents answered that it was to improve the family income or to complement it and to achieve independence, with both options accounting for 57% of the total:



**Graphic 2** Motivation for starting the business  
Source: Own elaboration, 2023

The SMARTPLS4 software was used for the variables, as it was a small sample and due to the nature of the study, this system was chosen and the following model was obtained. The following is the graphic model elaborated with the independent and dependent variables:





**Figure 1** Graphical model  
Source: Own elaboration with SMARPLS4, 2023

As for the Beta coefficients and collinearity statistics, it was found that both variables maintain a parameter higher than 0.20, which indicates that they have good inference in the model, and it was also determined that the access to finance variable has a greater impact on competitiveness. The collinearity statistics show that since the data are less than 5, there is no collinearity problem. The results are shown in the table below 1:

Variable	Coefficiente Beta	Estadísticos Colinealidad (VIF)
Access to finance-Competitiveness	0.510	1.221
Training-Competitiveness	0.245	1.221

**Table 1** Beta coefficient and VIF  
Source: Own elaboration with SMARPLS4, 2023

Regarding the R2, a value of 0.427 was obtained (moderate to weak) and according to the acceptance criteria indicated by Hair, Ringle and Sarstedt (2011), the R2 classifies it with the following values: 0.75 substantial, 0.5 moderate and 0.25 weak. Therefore, 43% of competitiveness is explained by staff training and access to finance.

In terms of hypothesis testing, it was found that financing and personnel training capabilities in micro and small enterprises positively impact competitiveness as the relationships were found to be statistically significant with a reliability value of 95% and also approved with the T-statistics higher than 1.76. Table 2 shows the results obtained:

Hypothesis	P value	T statistician	Result
H1 Financing capabilities in micro and small enterprises positively impact competitiveness.	0.000	5.004	Accepted
H2 Staff training in micro and small enterprises positively impacts competitiveness.	0.040	2.057	Accepted

**Table 2** Hypothesis testing  
Source: Own elaboration with SMARPLS4, 2023

**Conclusions**

Companies need to take different actions that differentiate them from their competitors in order to capture the market in which they operate. That is why having trained personnel and access to financing options can help them to prolong their permanence in the market. Similarly, evidence has been found that the use of advanced technologies such as artificial intelligence favours the conditions of knowledge exchange and thus the optimisation of resources (Vargas, Orozco, García, Ayala and Serrano, 2023).

The present research found that there is statistically significant evidence that financing capabilities and personnel training in micro and small enterprises have a positive impact on competitiveness. This was proven by significance tests at less than 5% error with p-values and Beta coefficients with a positive sign. This is in line with Changuán (2020) and Bohórquez, Caro and Morales (2017).

Therefore, it can be affirmed that the competitiveness of a firm is affected by the performance of its financing capabilities and staff training, the most relevant according to the Beta coefficient being the former with a value of 0.5. This inference is being explained with an R2 of 0.427, which indicates that there are other variables that affect competitiveness and are not being contemplated in this model, which represents an area of opportunity.

It is also important to note that the government must intervene in facilitating the conditions for building a better future, as it has been observed that the climate change factor has been detrimental to the performance of organisations in developing countries. This will be achieved by thinking about how to deal with these consequences in the medium and long term (Simmons and Simmons, 2023).

It is also important to point out that the strengthening of companies, relating them to investment and collaboration with other economic entities (even from other countries such as the members of the European Union) permeates into the improvement of the economic conditions of both organisations and employees. This is intended to reduce the backwardness caused by inequality, food security, among others (ECLAC, 2023).

Finally, it is necessary to mention that linking academia with society in the solution of real problems helps to address the economic lags that have been generated over time, reducing the uncertainty of the decisions taken by entrepreneurs in the sector under analysis. For future research, it could be recommended to investigate whether in other contexts, for example, another sector, the same behaviour would be observed or whether there are significant differences.

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## Organizational performance improvements through the design of internal controls, accounting records and determination of unit production costs in industrial smes of transformation, service and assembly

### Mejoras del desempeño organizacional mediante el diseño de controles internos, registros contables y determinación de los costos unitarios de producción en las pymes industriales de transformación, servicio y montaje

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#### Abstract

Organizations nowadays need to improve their performance, which is why it is necessary to have all the elements that are part of their administration, especially in the financial area. These SMEs (industrial processing, service and assembly) that have been investigated were found to lack financial information in relation to their production costs and support in terms of internal control elements, accounting records, as well as the calculation of return on investment and recovery of the same, which is achieved through the sale price of products and services offered. The small and medium-sized enterprises (SMEs) that were investigated and derived from their problems, the objective of this study is to show the improvements established for each participating entity and the recommendations suggested at the end of the project as a contribution to this research. The methodology suggested in the participating economic entities, following a description of them, in a period of time and by convenience sample and the application of a procedure consisting of a series of several four stages: analysis of financial data, improvement of internal control of operations, accounting records and determination of unit cost and % of profitability. Contributing in this inquiry this series of procedure and carrying it out, gives the certainty of contributing to a better performance of each one of the organizations and allowing with it to generate valuable financial information and profitability with percentage analysis.

#### Resumen

Las organizaciones en actualidad requieren consta mente mejorar su desempeño, por ello es necesario contar con todos los elementos que forman parte de su administración, en especial en el ámbito financiero. Estas Pymes (industriales de transformación, de servicio y de montaje) que se han investigado se les detecto la falta de información financiera en relación a sus costos de producción y respaldo en cuanto a los elementos de control interno, registros contables, así como el cálculo de rendimiento de su inversión y recuperación de la misma, la cual se logra mediante el precio de venta de los productos y servicios que ofrece. Las pequeñas y medianas empresas (Pymes) que se investigaron y derivado de su problemática, se establece el objetivo de este estudio que es mostrar las mejoras que establecieron para cada entidad participante y las recomendaciones sugeridas al término del proyecto como una aportación a esta indagación. La metodología sugerida en las entidades económicas participantes, siguiendo una descripción de ellas, en un periodo de tiempo y por muestra conveniencia y la aplicación de un procedimiento que consiste en una serie de varias cuatro etapas: análisis de los datos financieros, mejora de control interno de las operaciones, registros contables y determinación de costo unitarios y % de rentabilidad. Contribuir en esta indagación esta serie de procedimiento y llevándolo a cabo, da la certeza de contribuir a un mejor desempeño de cada una de las organizaciones y permitiendo con ello generar valiosa información financiera y rentabilidad con análisis porcentual.

Internal Controls, Accounting Records, Unit Cost

Controles internos, Registros contables, Costo unitario

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## Introduction

The economic entities will always be looking for ways to improve and have an avant-garde approach to what the markets in which they interact require from their products, in order to satisfy their customers.

It is extremely important to improve everything necessary and have timely and clear information, especially in their production processes, in the registration of their financial operations and in the determination of their unit costs.

These will allow them to set prices based on the recovery of their investment and calculate unit costs as a key to compete with fair prices in these markets.

In the case of industrial companies, which are linked in this research, were a group of small and medium-sized entities, with which a linkage agreement was established through a professional practice of costs, a case of the Technological Institute of Sonora (ITSON case).

Within the inquiry process, 4 stages were established, where they were carried out: questionnaires, reviews and observations as well as analysis of their financial data; some problems were detected in these organizations, and it was observed that they should improve the aspects of: internal control of their financial operations incurred during the production process, in their accounting records to determine their unit costs in order to support their administrative decisions and decide a more real and competitive price according to the particular case of each of the SMEs participating in this project.

The objective is to show the improvements established for each participating entity and the recommendations suggested at the end of the project as a contribution to these companies.

## Theoretical framework

In recent years it has been observed that companies are constantly changing, always looking to improve their operations, their structure and the way of doing business.

The opening to international markets, technology such as web platforms, and alliances with other business entities has created an opening of opportunities for them, so it will always be necessary to be evolving as any business, regardless of the size or type of operations performed.

This allows them to seek to improve day by day, from their forms of production in conjunction with the elements of quality delivered by their suppliers, the style of production must have a greater demand in the care of the inputs, the measurement of quality in their processing, the constant review of the form of control in their systematizations, the care of possible waste and taking into account the compliance with their customers through the satisfaction and delivery of their final products.

In organizations it will be relevant to have philosophies and ways of working that go in all directions, but especially in those from which both qualitative and quantitative decisions are made. In this sense, establishing changes, improving, adapting internal controls that validate and support its operations as a starting process will be the key to determine the appropriate procedures as described by (García, 2010).

Continuous improvement is identified as a management where the entity focuses on changing what is not working or innovating what is necessary or eliminating what is no longer working (Guerra, 2010), while Hernandez (2023) considers that companies are more efficient when working as a team and increasing productivity, this is part of a continuous improvement process.

In order to keep improving their performance, entities need to verify internally that they have an adequate internal documentary control that supports the financial operations that are constantly carried out. For this reason, the theory describes it and focuses on maximizing human labor, which helps to make processes efficient through the use of machinery, tools, products, raw materials and others (Valverde, 2020).

The internal control activities according to Meléndez (2018) establish procedures and measures that support in the case of SMEs (industrial and service entities) in their financial operations such as: the acquisition of materials, payment of salaries and control of manufacturing expenses, as well as control of human resources through the hierarchical structure, productivity control, attendance and everything that helps the administration of the companies.

Internal controls are directly related to the accounting records which will support the periodicity of its operations that are inherent to the production process which is defined as García (2010) comments.

Guardo and Andrade (2008) mention that financial operations at the time of registration must be supported by the internal control that each of them requires. They also describe that these operations are the accounting record of the financial decision made by the entity for an executed transaction.

Therefore, the financial operations that are made in terms of purchases of raw materials, materials, payment of salaries, payment of expenses, payment of debts, contributions to the company, customer collection, cash sales among many that are made every day, is that precisely the support of the same arises, through the documentary internal control.

In a specific case such as the production process, which is carried out in SMEs, since they transform goods and services, having a backup of the financial investments made will undoubtedly require internal controls for each of its production cost elements, as described by (Guardo and Andrade, 2008).

The concept of productive process mentions Quiroa (2019) is the set of tasks and procedures used for the production of goods and services. The process can be managed by stages, by elements of the productive process and by low production characteristics.

Chávez (2020) mentions that the process is a set of coordinated activities that plan the development of products and services under special characteristics and seek to meet market demands.

The production process will involve costs incurred in the stages or activities that are consumed at the same time that the products and services are produced.

For this purpose, it is necessary to have the accounting records validated in the accounting systems managed by each of the entities in order to quantify what was incurred in the process. Guajardo and Andrade (2008) highlight the importance of carrying out these accounting operations that arise from the production process in the elaboration of products or services, as the case may be.

The quantification of costs that are part of the production process, as in the following cases:

The quantification of the purchases made of the inputs to start the productive process, is going to require a backup supported by an internal control that validates such need and for them the following are required:

- a) Material Requisition. Document that supports the production request to the materials warehouse department within the production area.
- b) Purchase order. Document that originates from the materials warehouse to the purchasing department.
- c) Purchase order. Document that supports the materials requisition, the warehouse order up to the purchase request to the suppliers.
- d) Warehouse receipt. Document that supports the entry of the materials offered by the supplier to be fulfilled all this procedure of beginning of the production and that finally will be emphasized in the accounting record of purchases.
- e) Accounting record as the first step of the cost incurred to calculate the cost of the production process.

Date	Concept	Partial	Has to	To have
	Materials warehouse		\$	
	Creditable VAT		\$	\$
	Suppliers XXX		\$	\$
	sum equals			
concept of operation: purchase of materials of the month				
elaborated	Revised	Record	# POLICY	

**Figure 1** Accounting record of purchases in daily policy  
Source: Own elaboration

Subsequently, the production process continues by describing García (2010) the internal controls required and the corresponding accounting record in terms of wages and salaries or, as the case may be, direct labor, based on internal control processes and documents:

- a) Position in the organization chart: Sales, production, administration or other department.
- b) Attendance list or electronic card or fingerprint according to the corresponding schedule.
- c) Weekly or biweekly payroll according to the production period.
- d) Payroll receipt validating the payment obtained.
- e) Accounting record generated:

Date	Concept	Partial	Has to	To have
	Production cost	\$	\$	
	Wages and salaries	\$	\$	
	Sales expenses. Wages and salaries.			
	Taxes to pay			
	IMSS ISPT	\$		\$
	Banks Banamex	\$		\$
	sum equals		\$	\$

Concept of operation: payment of salaries for the period

elaborated	Revised	Record	# expenses
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**Figure 2** accounting record of purchases in expense policy  
Source: Own elaboration

These accounting records are supported by internal controls as described and shown in Figure 2. As for the third stage of the process, the key operations were considered to be indirect manufacturing expenses generated for the completion of the process and for the use of the fixed assets required to complete the products and/or services, as the case may be.

Del Río (2010) describes that as part of the elements of internal control in relation to indirect manufacturing expenses, the following should be considered:

- a) Concentrate of indirect manufacturing and/or service expenses in the period incurred.
- b) List of fixed assets required for production, as well as their calculation sheet for depreciation and amortization.
- c) Use of proration policies.
- d) Accounting records in policies.

Date	Concept	Partial	Has to	To have
	Indirect Manufacturing Expenses Light		\$	
	Banks			\$
	sum equals		\$	\$

Concept of operation: indirect manufacturing expenses of the month

elaborated	Revised	Record	# POLICY
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**Figure 3** accounting record of purchases in expense policy  
Source: Own elaboration

These control documents support this type of accounting operations that track the costs incurred in production, as mentioned by Napoles (2010).

It will also integrate the records that combine the production costs in relation to the three elements: materials, wages and salaries - indirect manufacturing costs - giving a cost of production or service as the authors described as (Garcia, Del Rio and Napoles, 2010) in terms of accounting mechanics and obtaining the report of the statement of cost of production.

Date	Concept	Partial	Has to	To have
	Production Cost in Process: Materials Wages and salaries Manufacturing overhead		\$	
	Stock materials Wages and salaries Indirect Manufacturing Expenses.			\$
	sum equals			

Concept of operation: transfer of costs incurred in production.

elaborated	Revised	Record	# POLICY
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**Figure 4** accounting record of purchases in daily policy  
Source: Own elaboration

Once the production cost elements are added and finalized, the cost of sales can be determined, so it will be necessary to send it to the finished goods warehouse as shown in figure N.5.

Date	Concept	Partial	Has to	To have
	Finished product warehouse		\$	
	Cost of Production in Process.			
	sum equals			\$

Cost of the finished product ready for sale.

elaborated	Revised	Record	# POLICY
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**Figure 5** accounting record of purchases in daily policy  
Source: Own elaboration

By obtaining the cost of production and in relation to the volume of production, the cost of sale of the product is determined and this accounting basis will allow setting a selling price to the public. Therefore, by carrying out internal controls and accounting records, it is possible to determine a cost concentrate, which serves as an administrative basis to check if the costs incurred increase or decrease, then the price could change and this is an improvement for the organization.

The production cost according to García (2010) mentions that it is the sum of all the efforts of raw materials, wages and salaries and indirect costs to produce or provide a service, hoping to obtain a benefit in the future, which is the profit through the selling price.

According to Napoles (2010), the selling price is the value at which goods and services are offered in a market and that the customer is willing to pay for it.

For small and medium-sized enterprises (SMEs) it is a great performance for the organization to know and take care of the resources they invest in their goods and services, undoubtedly this facilitates the management of their business. Having clarity in the resources invested allows them to always measure their profitability through the price.

For the Ministry of Economy (SE, 2023), SMEs are small businesses that, depending on their number of workers and level of income generated, are identified as: micro, small, medium and represent a large participation in the gross domestic product and in the generation of employment.

**Methodology**

The linkage with the productive sector such as entrepreneurs and managers of small and some medium-sized enterprises (SMEs) has allowed generating a descriptive analysis of the problems they face in relation to the lack of internal controls that support the financial accounting operations in the context of their productive processes, also has a low performance in the calculation of unit cost of products and some services offered, which is why this inquiry is supported by an agreement of agreements linked to the professional practice of costs, where they could apply elements of information search and analysis of hard data to which they had access and also identified the processes incurred in the development of their products.

Objects of study 20 small and medium-sized companies linked through the professional practice of costs during the period from January to May of fiscal year 2023.



**Materials:** Use of data analysis that are directly related to the financial operations of the items generated in these businesses in the elaboration of their products and services. Students studying the seventh to eighth semester of the Public Accountant program. In each of these businesses, a series of questions, descriptions of their processes, method of observation and data collection of such accounting operations and the support of accounting and financial controls of the same were applied directly to the manager or owner of the company, or the person to whom he is managing it.

### Procedure

**Phase 1** In this stage, the linkage agreements with the entrepreneurs were concentrated, authorizing to work with their companies (from each of the 35 participating SME companies) signing and authorizing the generation of the information related to the financial accounting operations generated during the productive process and the internal control backup of each one of them.

In this phase, some needs were detected to improve these internal control documentary formats, due to their lack of compliance to validate these operations, as well as the method of observation in the companies themselves.

**Phase 2.** Here were concentrated the total of financial accounting operations ranging from: the needs of requisition of inputs, the amounts of purchases acquired for a period of one month, considering the highest month of production, as well as the expenses generated by the concept of wages and salaries and social security deriving with it the fulfillment of the payroll during the same selected period of the production of that month.

All the financial operations were directly related to the production process of a selected month in each one of the SMEs, also the indirect expenses that go in this way with what the production of the good or service requires, concentrating on it each accounting item, the amount of the month and the application of the proration policies.

These data were raised in the questionnaires used with the entrepreneurs or manager of the companies.

**Phase 3.** Analysis and concentration of the financial data of the accounting items that make up the cost of production formed by: the amount of raw material consumed in the month by each of the entities, the wages and salaries accrued in the same accounting period, the indirect expenses incurred as part of the final process.

**Phase 4.** In order to determine the unit cost of production, it was necessary to carry out the accounting process of the operations located as part of this research. For this purpose, expense policies, journal policies and transfer policies were made in relation to the elements of the production cost: raw materials, wages and salaries plus indirect manufacturing expenses.

Finally, the follow-up of these phases was carried out, as part of obtaining the results of improvement for the performance of the SMEs.

### Results

In relation to the results obtained, the composition of Table 1 shows the type of industrial SMEs investigated in number and %.

Industrial company	#	%
Transformation	7	35%
Services	12	60%
Mounting	1	5%
total	20	100%

**Table 1** Industrial and service SMEs

Source: Own elaboration

As can be observed, 35% of them are from transformation industries such as: food, clothing and furniture; while 60% correspond to 12 service companies and 1 assembly company.

Company type	Requisition	Order	Order	Entrance	total
Transformation	7	6	7	7	27
Services	12	10	12	12	46
Mounting	1	1	1	1	4

**Table 2** below shows the internal control designs in relation to the improvement of raw materials and/or materials in the industrial and service SMEs.

Source: Own elaboration

Here we quantify the internal controls of the materials that are proposed as improvements and support for the investments made in these resources.

Company type	Organization chart	Payroll	Payroll receipt	Cost per man hour	total
Transformation	7	7	5	7	26
Services	12	12	10	6	40
Mounting	1	1	1	1	4

**Table 3** Design of internal controls over wages and salaries in industrial and service SMEs.

Source: Own elaboration

In this table the internal controls for the industrial SMEs were elaborated, such as: organization chart, payroll, payroll receipt and man-hour cost in the period in which the cost was incurred for each one of them, giving a great number of improvements to their performance.

Company type	Depreciation	Apportionment	Expense Ratio
Transformation	7	7	7
Services	12	12	12
Mounting	1	1	1

**Table 4** Design of controls for SMEs in relation to Indirect Manufacturing Expenses.

Source: Own elaboration

Here was improved for the performance of the control of indirect manufacturing expenses in the industrial and service SMEs, considering that the necessary formats for the control and distribution of expenses were 100% complied with.

Company type	Sales	Administration	Production	total
Transformation (embroidery)	3	3	3	9
Transformation (bakery foods)	1	1	1	3
Transformation (footwear)	3	4	3	10
Transformation (sausage foods)	10	0	4	14
Transformation (construction)	4	4	7	15
Transformation (chemicals)	0	1	3	4
Transformation (carpentry)	2	1	2	5
Services (taqueria)	5	5	1	11
Services (transport)	2	2	3	7
Services (food)	1	4	1	6
Services	0	5	0	5
Services (cellular)	1	2	2	5
Services (dinner)	0	1	2	3
Services (room washing)	2	1	7	10
Service (painted)	0	1	2	3
Services (Taqueria)	0	4	3	7
Services (dinner)	0	2	1	3
Services (clothing)	0	2	1	3
Services (holiday events)	3	0	1	4
Assembly (bicycles)	1	1	2	4

**Table 5** Number of employees distributed in the functional areas of the Industrial and Service SMEs

Source: Own elaboration

As can be seen, the number of direct jobs in industrial and service SMEs range from 3 to 15 employees.

They range from 3 to 15 employees, so the benefit is observed in the generation of work and in the economic participation taking care of their performance.

In order to understand their own economy, the financial statements that determine the unit cost of their products and the production cost statement were obtained, for this purpose Table 6 is shown.

Company type	Unit cost	Edo. Production Cost
Transformation	7	7
Services	12	12
Mounting	1	1

**Table 6**

Source: Own elaboration

This result shows the amount of unit cost and production cost reports that provide industrial and service entities in making appropriate financial decisions.

In Table 7, Unit Costs for Transformation SMEs.

Type of company Transformation	Unit cost	Sales price	Utility %
Bread	\$3.01	\$8.00	62%
Sausages	\$89.57	\$130.00	31%
Carpentry	\$3,591.64	\$7,000.00	49%
Biotechnology	\$30.12	\$210.12	86%
Footwear	\$1,323.92	\$5,100.00	74%
Construction	\$143,131.32	\$550,000.00	74%
Tortillería (tortilla chips)	\$43.68	\$62.00	29%

**Table 7**

Source: Own elaboration

This table shows an organizational improvement of great magnitude, since it shows the unit cost of each participating entity and allows a reliable basis of the investment made by setting a price for the processing industry.

Services	Unit cost	Sales price	Utility %
Caps	\$5.09	\$75.00	93%
Bread	\$3.146	\$5.00	37%
Jelly	\$8.98	\$15.00	40%
Embroidery	\$41.75	\$150.00	72%
Carnitas tacos	\$20.56	\$38.00	46%
Transport	\$845.82	\$9.00	30%
Asada tacos	\$21.35	\$30.00	29%
Taquizas	\$15,869.67	\$24,975.00	36.5%
Cenaduría (toast)	\$12.68	\$35.00	64%
Washed	750	1500	50%
Consultancy	\$1,241.26	\$2,000.00	38%
Cell phone	\$700	\$1,200	42%

**Table 8** Unit costs vs. sales price, profit %

Source: Own elaboration

Here you can see table 8, which measures the sales

The sales volume is measured and in the same will have the investment recovery and the performance parameter that any business unit can expect. In table 9 SMEs assembly:

Mounting	Unit cost	Sales price	Utility %
Bicycles	\$3,770.18	\$8,000.00	47%

**Table 9**

*Source: Own elaboration*

This is the only company studied that performs the assembly service and its unit costs, achieving 47% gross profitability.

Finally, these results allow us to fulfill the objective of this research, which is to show the improvements achieved in this group of small and medium-sized companies.

Each of these results shows the improvements that were made to each of the participating organizations, ranging from internal control documents in terms of materials, then the designs established in the area of direct wage and salary expenses, controls in the registration of indirect manufacturing overhead operations and the participation of workers in the areas of functions of the entities such as: sales, administration, production.

Other improvements that were achieved are the obtaining of financial reports that allow making adequate decisions such as the calculation of the unit cost and production cost statement.

These improvements are supported by the accounting records that various authors such as García (2010), Cárdenas (2011) point out on the accounting mechanism of production costs and services.

Guardo and Andrade (2008) argue that the accounting records and their production mechanics are used to identify unit costs and production cost reports.

The most important finding is that in spite of having SMEs that have been in existence for some time, the lack of internal controls and calculations of unit production costs is a deficiency, and despite manual support or accounting information systems, at this stage the businesses lack adequate internal controls.

Controls and records that are made through documents in their daily productive operations and that the most important thing they should always handle is to have a traditional basis of unit costs in their production processes.

Undoubtedly the recommendations that are observed in the bibliography are an adequate contribution at the present time in spite of the ease of handling technology.

## Conclusions

The results show in each of the figures and tables provided, the improvements achieved from the internal control documents in relation to the elements of production: raw materials, wages and salaries to indirect manufacturing costs.

As inputs, documents that support the operations of the accounting mechanics of the production process and services. The calculations achieved through the financial information regarding the obtaining of each unit cost by entity.

Estimated sales price fixations for each entity. Profit yield % of each entity achieved through the difference between the gross unit cost and the difference between the selling price.

On the basis of Improvements in Organizational Performance through the Design of Internal Controls, Accounting Records and Determination of Production Costs in the SMEs linked to the Professional Practice of Costs, each of these results is described.

The finding sustained is that this type of methodology supports any economic entity to determine its controls, records and financial reports.

Also the argument of the writers del Rio (2010) and Chavez mention that the production process is the key to determine the costs incurred and be the starting point for measuring profitability in any business.

Achieving the stated objective and the methodology proposed in this research.

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## Evaluation of the degree of social responsibility in micro and small businesses in the food service sector

## Evaluación del grado de responsabilidad social en micro y pequeñas empresas del sector servicio de alimentos

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### Abstract

The objective of this study was to evaluate the degree of social responsibility in micro and small companies in the food service sector. The evaluations were applied to 63 fixed establishments dedicated to the preparation, sale and consumption of food, distributed in eight municipalities of the state of Jalisco, Mexico, which were grouped according to the categories established in the North American Industrial Classification System. A single visit survey was applied to each establishment. The Corporate Social Responsibility index was applied to the results. 6.3 % of the establishments were Socially Responsible, 54 % moderately responsible and 39.7 % as not responsible. The last two ones have elements of Corporate Social Responsibility, but not as structured programs. It contributes to obtain a deeper understanding of the problems involved in trying to apply a sustainable administrative management to accommodate a system of social responsibility, which supports and records the decisions that are being made in the company from this perspective, in order to plan successful intervention strategies.

**Business ethics, Restaurants, Socially responsible management**

### Resumen

El Objetivo del presente estudio fue evaluar el grado de responsabilidad social en micro y pequeñas empresas del sector servicio de alimentos. Las evaluaciones se aplicaron a 63 establecimientos fijos dedicados a la preparación, venta y consumo de alimentos, distribuidos en ocho municipios del estado de Jalisco, México, los cuales fueron agrupados de acuerdo a las categorías establecidas en el Sistema de Clasificación Industrial de América del Norte. Se aplicó una encuesta en visita única a cada establecimiento. A los resultados se les aplicó el Índice de Responsabilidad Social Corporativa. El 6.3 % de los establecimientos resultó Socialmente Responsable, el 54 % medianamente responsables y el 39.7 % como no responsables. Los dos últimos cuentan con elementos de Responsabilidad Social Empresarial, pero no como programas estructurados. Se contribuye a obtener un entendimiento más profundo de la problemática que implica el intentar aplicar una gestión administrativa sustentable para dar cabida a un sistema de responsabilidad social, que soporte y registre las decisiones que desde esa perspectiva se vienen tomando en la empresa, con el fin de planear estrategias de intervención acertadas.

**Ética empresarial, Restaurantes, Gestión socialmente responsable**

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## Introduction

Corporate social responsibility (CSR) refers to the voluntary commitment that companies have regarding to their effect on society, this involves compliance with laws and the integration of environmental, social and ethical elements in the development of their strategies (European Commission, 2018). Although it has been suggested that the only responsibility of companies is to grow within the legal framework, it has also been proposed that those that are managed ethically, acting voluntarily to remedy their effects, attract employees and consumers with the same values, promoting their financial growth (Jones, 1995; Lerro et al., 2018; Santiago, 2003), which can be achieved through CSR.

Since almost half of the population lives below the poverty line, the consumer market is reduced and the companies have the need to worry about the consumer perspectives that keep them running, for which strategies are used to support the employees, the environment, social causes, the reuse or reprocessing of raw materials (Santiago, 2003), the welfare of animals in production, the management of food waste, the reduction and use of residues where the food industry is an important generator, including remediation and mitigation strategies (Hartmann, 2011; Kong, 2012; Nagyová et al., 2016; Núñez, 2008; Podnar & Golob, 2007).

In Mexico, CSR is under development and its distinctive is granted by the Alliance for Corporate Social Responsibility (Responsabilidad Social Empresarial y Sustentabilidad [RSS], 2014) and the Mexican Center for Philanthropy (CEMEFI, 2023). The companies that obtain this distinction are those that work with respect for customers, workers, suppliers, the government, those involved with it, and the environment (López et al., 2011).

One of the particular aspects that are included within CSR in the food industry is food safety, which mainly promotes the exercise of hygienic practices that help reduce the possibility that the food causes any illness to the consumer (Kong, 2012), but they have to be evaluated using tools specifically designed for this purpose such as the specifications of the Standard NOM-251-SSA1-2009 (Secretaría de Salud [SS], 2010), which is not addressed in the present study.

The lack of implementation of social responsibility activities within the food service industry can cause detrimental effects to the development of the company. In situations in which outbreaks of foodborne diseases have arisen from the consumption of food from restaurant chains, a decrease in sales, popularity, trust and loyalty among consumers has been recognized affecting directly the growth and financial stability of these companies (Seo et al., 2017), however, by having a CSR program formally implemented, the recovery of the establishment is more viable.

One motivation for the application of socially responsible strategies is the improvement of the public image of companies, coupled with the pressure imposed by governments and Non Governmental Organizations (NGOs) of various countries, which seek to expand their effect among the public by promoting activities that consumers, employees and investors can consider ethical, and therefore generate trust between them and the intention to pay the added value of CSR (Nagyová et al., 2016; Núñez, 2008; Ocampo-López et al., 2015; Podnar & Golob, 2007).

Companies that apply CSR strategies increase the loyalty, commitment and performance of workers, which will impulse the company to grow economically, while companies that do not apply CSR within their activities may be affected by the rejection of ethical consumers and can even suffer attacks by them, ruining their image and therefore decreasing their profitability (Podnar & Golob, 2007).

Some of the factors that influence CSR are education for the consumption of any type of good, both for the supplier and for the consumer, competition, including globalization, and the application of laws, among others. In this sense, it has been observed that in Europe there has been more progress in the practice of CSR related to the food area than in Latin America, and a determining point is the degree of industrialization of the region due to the fact that certain technology is required for obtaining, preserving and handling food (Aguilar, 2018).

However, there are other factors that give Latin American countries a certain advantage, since they are producers of a large quantity and diversity of foods that are consumed in less time, so their handling and preservation require less sophisticated technology.

Another factor that favors and underpins CSR in general is the communication that companies establish with their customers. This is relevant in the food sector since by publicizing responsible actions with their workers, with their clientele and with the environment, the probability of being chosen by a greater number of people as a frequent place of consumption increases (Germán-Cáceres et al., 2023; Juárez, 2019; Ocampo-López et al., 2015; Pinzón-Ríos et al., 2015), that means, that users give added value to companies with CSR, generating brand loyalty and an increase in consumption intention.

The objective of this study was to evaluate the degree of social responsibility in micro and small companies in the food service sector.

By not having the culture of Corporate Social Responsibility in the field of food services, it is expected that less than 10% of the evaluated establishments comply with the Social Responsibility index.

## Methodology

The study had a quantitative, non-experimental, descriptive and observational approach. The evaluations were applied to 63 fixed establishments dedicated to the preparation, sale and consumption of food, classified as Micro and Small Companies, distributed in eight municipalities of the state of Jalisco, which were grouped according to the categories established in the North American Industrial Classification System (NAICS), for food and beverage preparation services (INEGI, 2021).

A single visit survey was applied to each establishment with prior authorization from the owner or person in charge of it, which addressed the following sections: 1. General data; 2. Profile of the employer and employees; 3. Operations; 4. Corporate Social Responsibility (social component, economic component, environmental component).

The results of the surveys were captured in a spreadsheet to apply the Corporate Social Responsibility (CSR) Index (Reyes et al., 2017, p. 149), in which the value 1 was given when the indicator favorably influences the behavior of CSR. A value of 0 was given when the indicator unfavorably influences the behavior of CSR.

Calculation of the index by dimension:

$$Id = (\sum VI)/n \quad (1)$$

Where:

Id = Index by dimension.

VI = Criteria applied to each indicator according to its influence on CSR based on the assumed assumption, which can be 1 or 0.

n = Number of indicators that make up the dimension.

Based on the above mentioned, if an index less than 1 is obtained by dimension, it means that there is some indicator that is deteriorating CSR.

The CSR index was then determined using the following formula:

$$IRSC = \sum Id \quad (2)$$

Where:

IRSC = CSR index.

Id = Index by dimension.

The ranges were established to evaluate business behavior in relation to CSR according to table 1.

CSR index*	Classification category
$3 \leq CSRI \leq 2.5$	Socially responsible (SR)
$2.5 < CSRI \leq 1.5$	Moderately responsible (MR)
$CSRI < 1.5$	Not socially responsible (NR)
* These limits are established taking into account that 1.5 represents 50 % of 3 and 2.5 represents 83 % of 3	

**Table 1** Definition of ranges for the Corporate Social Responsibility index

Source: Reyes et al., 2017

Results above 83% become the desirable parameter, since it satisfies the minimum category within the criteria of a high social responsibility of the company.

ANOVA and HSD Tuckey test were performed (Statgraphics, 2023), grouped by: section (social, environmental and economic); classification category (SR, MR and NR), and NAICS category. Statistical significance was accepted with a confidence level of 95%.

## Results and Discussion

### *General data*

The results of the surveys carried out to analyze the degree to which companies are interested in providing well-being through their actions, show that it is necessary to disseminate information on the definition of CSR and the benefits that offers for the development of companies. 63 respondents, 40% said they did not know the concept and 27% do not think that social responsibility is a relevant element for business growth. It is a contrary situation to what they report Uba et al. (2023), in whose study the majority of the owners-managers of microenterprises know and understand the concept of CSR, but they understand it as philanthropy and define it as "giving back to society", which may explain the lack of vision of those surveyed in this work.

As reported by Juárez (2019), 67% of Mexicans, and 62% of food companies, consider that the expenditure generated by CSR is an investment while 27% consider it an expense, which coincides with the present study.

Of these food service providers, 54% include family members in their workforce, and 60.31% are registered as individuals, while 11.11% did not provide information, and the rest (28.57%) is registered as a moral person, in the Tax Administration System.

53% of those surveyed are professionals who do know the CSR concept, 36% of those responsible have taken a course on CSR.

In addition to the fact that 64% of those surveyed have not taken a CSR course to reinforce its execution within the company and learnt about its benefits, the fact that those who affirmed that CSR helps the success of companies represented 73% it is relevant, and includes those who have not taken workshops on this subject, as mentioned Ingold et al. (2003).

### *Social and economic components*

The benefits granted to employees by employers are also considered as elements of CSR and serve as indicators to know the level of commitment that companies have with improving the quality of life of their employees Ingold et al. (2003).

Most of the interviewers (81%) stated that they complied with the provisions of the Federal Labor Law, respecting the rights of workers and giving them the basic benefits required by law. 57.14% assured that they have had work accidents in their facilities, and despite the fact that 55.56% of the companies surveyed did not have a service for major medical expenses, 66.66% stated that they provided the basic medical service required by law.

Only 12.7% offer a daycare service, 64% do not provide life insurance, 71% do not provide transportation support and 33% do not have dining room support for employees, although 77.77% comment having suitable areas for the food consumption of their workers.

They inquired about special benefits that could take parents into consideration, and only 57% of employers confirmed having considerations for single parents, while 71.42% said they grant schedule flexibility and 57% affirmed that within their hours of service they include quotas of special hours for family or paternity leave.

Žukauskas et al. (2018), establish that involving company participants in social responsibility activities helps generate greater empathy and better relationships among employees creating a positive culture within the company and for this reason participation activities were taken in consideration in this study, recreational, cultural and social, is a topic in which 44.44% of the companies declared having activities on a regular basis.



Artz et al. (2018), affirm that labor abuse and a bad environment in the workplace have repercussions on the performance of employees, as well as stress and psychological effects on them, however only 74.6% of the employers interviewed confirmed sanctioning the use of physical punishment and psychological, 71.42% instruct their workers to prevent them from being involved in situations of harassment or abuse, while 69.84% even have reporting and monitoring systems for these cases.

The prestations and benefits of employees are not the only issues that companies must take care of in order to be within what it is established as necessary to be considered socially responsible, therefore, in the surveys carried out, the commitment that they provide to consumers was also analyzed, by including CSR criteria for the selection, evaluation and renewal of suppliers, in this area 63.49% of the surveyed companies affirmed having them.

The correct use of the facilities and the signaling of the areas that make it up are necessary, so that diners are safe in cases of emergency, in this part of the care and responsibility for the well-being of its consumers, it was asked if the service providers had with signs of assistance for evacuations and 88.88% of these assured that they had them.

93.65% of those surveyed reported that they carry out service activities within health standards and 95.23% provide drinking water, cleaning areas and clean toilets for employees.

The professional and academic growth of the employees and their encouragement by the company is part of the CSR elements that help them grow, for this reason the support they provide for the continuation of studies was questioned, and only the 47.61% confirmed that they promote their collaborators to complete basic education and 68.25% provide training to them, in which only 65% include CSR topics (although not necessarily explicit as CSR), while 80.95% reported that they usually recognize employees regarding innovation and the contribution of ideas.

In the study of Ingold et al. (2003), conducted in Australia, employers reported that CSR helped them create social benefits, often based on support for diversity, inclusion and affirmative action intentions.

Gender parity and non-discrimination are currently relevant issues whose fundamentals are disseminated within CSR, ensuring equity in salaries and hiring, regardless of gender, race, disabilities or sexual orientation of employees. 80.95% of the employers declared to be promoters of equity, although only 28.57% said they have programs for hiring people with disabilities and 52.38% have security conditions for the work performance of vulnerable groups, about hiring people over 50 years old or with long downtime labor, only 58.73% offer opportunities to this sector of the population, and 85.71% of these have increased hiring women or other minority groups in their company.

65% of the businesses surveyed reject child labor, not accepting support for activities that affect the dignity of people, while 95.23% are aware of Human Rights and sanction non-compliance with respect for them, so that 93.65%, seeks to promote compliance with Human Rights and 92.06% assures that they take care of the coherence between their business activities and the application of CSR.

82.53% also reported promoting ethics among their employees and groups they are related to, and 52.38% reported having a complaint mechanism for actions that interferes with established codes of conduct.

Honest market competition practices are applied by 80.95% of employers, 88.88% affirm that they also carry out honest transactions within the business, and 85.71% reported that they promote ethical and legal sales practices.

They were asked about the honest and accurate disclosure legal and financial situation of the company's to its participants and 76.19% say complied with this premise, in addition to 79.36% said they included CSR aspects in their policies (although not always written and operational), while 69.84% reported having safety, work and health guidelines, 55.55% with marketing and consumer protection guidelines, 49.20% have basic community development programs and 42.85% care for the environment, 46.03% with support for employee education, and even 47.61% address ethical training issues for employees.

The participation of employers in the work environment in order to be harmonious was also the subject of the survey, where 71.42% of those responsible said they were participants in the generation of an environment free of conflicts of interest, and 73.01% count with sanction mechanisms for the detection of illegal activities or corruption within the business, 76.19% also apply sanctions to conducting illegal businesses, of which 66.66% of the total respondents keep employees informed about the detection system and sanction of corruption.

The communities where the companies are developed and that make them functional must also be benefited by them, for that reason the interest of the businesses in participating in the well-being of the regions where they are located was inquired, and only 53.96% of these said they actively participate in the construction of a sustainable community through participation in environmental, economic and social protection, 58.73% maintain monitoring of community affairs and 61.90% are given the task of knowing in depth the community in order to develop an adequate way that avoids the existence of activities that causes problems due to the difference in customs within it, although only 57.14% participate in organizational dialogues with the community, 60.31% participate in activities that reduce inequality and help strengthen the human, natural and social capital of the region, and 53.96% said they have action in decision-making on public policies.

About Uba et al. (2023), point out that the owner-managers of microenterprises with CSR activities can be categorized as social problem solvers or as empowerers (those who help people to fend for themselves), both categories were presented in this study. Linked to the issue of compliance with the law and adherence to a code of ethics there is the fact of compliance with tax payments, where 96.82% claimed to be registered with the Tax Administration System and 93.65% claimed to pay taxes to this secretariat, of those who are registered and pay taxes, 76.19% pay within the defined time, 39.68% withhold income taxes from employees, and 55.55% select social purposes related to their business and 49.20% contribute part of their profits and other resources to carry out said activities, 39.68% also provide space or equipment for their execution.

It is important to recognize the origin of the raw materials and inputs used within a company, since within CSR all aspects involved with the generation of a paid activity for businesses are considered where the elements must also come from a company that complies with CSR; 63.49% affirmed that they comply with this premise, 46.03% say they have strategies to help their local suppliers develop, although only 46.03% include vulnerable population within their suppliers, 66.66% said they buy raw materials to small producers.

#### *Environmental component*

In addition to, it seeks to establish a system within companies that takes care of the environment and carries out its activities in a sustainable way for itself and for the community where it is developed, for this reason the level of participation in the development of sustainable activities is evaluated by different business and 73% declared to take this aspect into account when executing productive, administrative and labor activities. Only 57.14% of those surveyed said they include this topic in their mission and vision, 57.14% do through the use and support for the development of sustainable technologies, and 49.20% apply domestic laws and regulations related to this topic.

The results obtained related to social responsibility associated with the environment coincide with what was mentioned by Juárez (2019), regarding to the fact that in Mexico, companies in the food industry that develop CSR strategies favor those related to the workplace, the environmental area and compliance with laws and regulatory standards.

According to what was reported by Aguilar (2018), in Mexico, the total loss of food is approximately 35%, which is equivalent to 10,000 million dollars per year, in addition to this, it mentions that 96% of micro and small companies in our country do not develop CSR actions related to the reduction of food loss. In this aspect, 69.84% of those surveyed answered that they do give an alternative use or adequate disposal of their residues, by-products and waste.

Eventhough many claim to be in favor of the execution of their activities in a sustainable manner, only 57.14% have previously expressed this situation and invest in innovation on this subject, foreseeing the use of resources based on their maximum use, even 33.33% of them reported that contribute part of its profits before taxes to the execution of activities for this purpose.

In the same way, the use of resources such as water or electricity was inquired and it was found that 41.26% have strategies to promote the responsible use of water, 44.44% avoid disposing of solid waste in the drainage and 36.5% promote savings plans for office supplies among workers.

As part of its actions to develop, the company in a sustainable manner, the promotion of environmental education is included, thus complementing its positive effect on the community in where they are located, among those surveyed, 31.74% reported that they carry out outreach activities of the subject and make the community aware of its effect on the environment, 52.38% know how it affects the environment where it is developed, 34.92% have carried out activities to reduce the effect or remediate it, and eventhough 20.63% work in an organized manner with other stakeholders in caring for the environment, only 17.46% receive support from public organizations that focus on these issues.

#### *Application of the corporate social responsibility index*

The results obtained coincide with the study of Juárez (2019), developed in Celaya, Mexico, in the sense that CSR is considered as a relatively unnecessary expense rather than as an investment to improve conditions for workers, reduce environmental impact and increase company performance, among others.

It contrasts with what was expressed by Ingold et al. (2023), in which Australian employers identified: better employee retention; "make a difference" in the lives of employees; and financial benefits derived from cost savings for the company.

In the case of companies in the food industry in Mexico, 70% implement CSR programs, which has allowed more than half to increase their exports. Even though the benefits of developing this type of program are evident, 46.2% use it as a marketing strategy rather than for the benefit of their employees and customers (Juárez, 2019). Although the benefits of applying CSR strategies permeate to the benefit of these, the fact is that it is conceived as a market strategy and it could have repercussions in the devaluation of the concept.

Uba et al. (2023), indicates that the majority of microenterprises that practice CSR do so thinking only of "voluntarily giving back to society" and it depends on the particular perspective of the owner-manager.

6.3% of the establishments were socially responsible, 54% moderately responsible and 39.7% not responsible (table 2).

The lowest value found (0.23) corresponds to an establishment categorized in 722511, but also in this category there are two of the four Socially Responsible establishments with the highest score (2.67 (franchise) and 2.79).

The Socially Responsible restaurant corresponding to category 722517 corresponds to a franchise with a rating of 2.80, the highest in the entire study, which coincides with the work of Ingold et al. (2003), in where the presence of actions promoted through CSR programs was more evident among large employers. In addition to the fact that companies with better financial performance tend to have greater financial resources to invest in social strategies (Germán-Cáceres et al., 2023).

The last food service cataloged as Socially Responsible corresponds to an industrial dining room (2.53), belongs to category 722310.

It is observed that there is a large area of opportunity to promote CSR, this is consistent with the results of previous studies in which it is mentioned that the companies that develop the greatest CSR actions are those that have been in the market for the longest time (Juárez, 2019; Pinzón-Ríos et al., 2015; Ocampo-López et al., 2015), as reflected by the four establishments classified as Socially Responsible.

It should be noted that there were four establishments with a "zero" score in the environmental section, which on average had the lowest score (0.68), followed by the social section with 0.76 and the economic section with 0.81. A study of companies in the food sector in Quito mentions that there is a need to generate more actions to achieve continuous improvement, especially in environmental components in production process, and that there are companies that are more committed than others, evidencing that more initiatives are needed to contribute to the goals of sustainable development (Martínez et al., 2022).

When performing the statistical analysis, it was revealed that there is a significant difference between the different sections, social and environmental ( $p < 0.01$ ); social and economic ( $p < 0.05$ ); environmental and economic ( $p < 0.01$ ), that is, the economic component has a significant effect on the social and environmental components. When analyzing the results by classification category, MR was significantly different from NR ( $p < 0.05$ ). According to the NAICS category, there were no significant differences ( $p > 0.05$ ).

Although the dissemination of information about companies that carry out CSR activities is essential, the media generally does not disseminate the actions of companies that strive to develop social responsibility (Pinzón-Ríos et al., 2015).

Naics key	Index range	Nr	Mr	Sr
722310 Dining services for companies and institutions	2.53	-	-	1
722320 Food preparation services for specials occasions	1.92	-	1	-
722412 Bars, canteens and the like	0.85-1.73	2	2	-
722511 Restaurants with food preparation service menu or full meal	0.23-2.79	11	13	2
722512 Restaurants with fish preparation service and seafood	1.36	1	2	-
722513 Restaurants with snack preparation service	1.18-2.36	1	2	-
722514 Restaurants with tacos and tortas preparation service	0.84-2.49	4	4	-
722515 Cafeterias, soda fountains, ice cream shops, soft drinks and the like	1.46-2.48	1	4	-
722517 Restaurants with pizza preparation service, burgers, hotdogs and roast chicken to go	1.09-2.80	3	4	1
722519 Other food preparation services for consumption immediate	0.98-1.97	2	2	-
TOTAL	0.23-2.80	39.7%	54%	6.3%
NAICS: North American Industry Classification System NR: Not Responsible	MR: Moderately Responsible SR: Socially Responsible			

**Table 2** Results of the application of the Corporate Social Responsibility index

Source: Direct

## Financing

The project was developed without financing but with the endorsement of the Research Coordination and the Department of Public Health, CUCBA, Universidad de Guadalajara.

## Conclusions

It contributes to obtain a deeper understanding of the problems involved in trying to apply a sustainable administrative management to accommodate a system of social responsibility, which supports and records the decisions that are being made in the company from this perspective, in order to plan successful intervention strategies.

Most companies participate in voluntary CSR activities, only 6.3% of those surveyed comply with the components of Corporate Social Responsibility.

54% of the establishments were moderately responsible and 39.7% as not responsible, which allows a good field of action for institutions or individuals that are dedicated to offer advice in the food service sector, since the vast majority of establishments have bases for a significant improvement in the short term. By obtaining a rating of 0.68, the environmental component is the one that requires the most commitment from the companies, in the vast majority of the establishments there are no written and operationally established programs, they are attitudes of the owners or managers, which involve the components of CSR in their daily activities, so that with training and awareness programs with a comprehensive approach (social, economic and environmental), not only towards companies, but also towards the community, it is possible to have a positive effect on nature.

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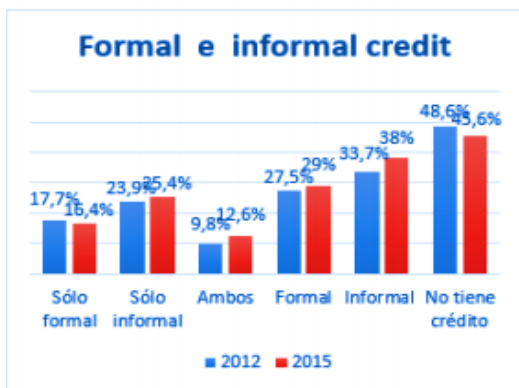
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