"El saber de mis hijos hará mi grandeza"

NUMBER
95
ISSN:
2683-2623

VÉRTICE UNIVERSITARIO

Hermosillo, Sonora, Mexico • January-December 2024 • Year 26

INDEXED IN:

80 ANIVERSARIO UNIVERSIDAD DE SONORA 1942 2022

AURA · CLASE · CONACYT PRE-CLASIFICADA · Dialnet · Signatory of DORA · EZB Elektronische Zeitschriftenbibliothek · Google Académico · I40C · LatinREV · latindex · MIAR · REDIB Red Iberoamericana · SERIUNAM Catálogo · Catálogo de Libros Universidad de Sonora · Ciencia UNISON · Repositorio Institucional Universidad de Sonora · Revistas UNISON

VÉRTICE UNIVERSITARIO Volume 26 Number 95 (January-December) of 2024 is a continuous annual publication edited by the University of Sonora, through the Interdisciplinary Faculty of Economic and Administrative Sciences. Blvd. Luis Encinas and Av. Rosales s/n, Col. Centro, C.P. 83000, Hermosillo, Sonora, Mexico, Tel. 52(662) 259-21-66, www.revistavertice.uson.mx; vertice@unison.mx. Responsible editor: PhD. Edna María Villarreal Peralta. Reservation of Rights to Exclusive Use 04-2022-082615335300-102 granted by the National Copyright Institute. ISSN: 2683-2623. Responsible for the last update of this issue: PhD. Edna María Villarreal Peralta.

Vértice Universitario

Vértice Universitario
Peer-reviewed journal of Universidad de Sonora
Division of Economic and Administrative Sciences
Indexed in Sistema Regional de Información en línea para revistas científicas Latindex: Folio 14186.
Indexed in Clase, the database of Latin American and Caribbean journals in social sciences and humanities of Universidad Nacional Autónoma de México.
Indexed in Periódica Index of Latin American Scientific Journals.
Indexed in Scielo México.

VÉRTICE UNIVERSITARIO, Volume 26, Number 95 (January-December) 2024 is a continuous annual publication edited by Universidad de Sonora through the Interdisciplinary Faculty of Economic and Administrative Sciences. Blvd. Luis Encinas and Av. Rosales s/n, Col. Centro, C.P. 83000, Hermosillo, Sonora, Mexico, Tel. +52 (662) 259-21-66, www.revistavertice.uson.mx; vertice@unison.mx. Editor-in-chief: Edna María Villarreal Peralta, PhD. Exclusive Rights Registration 042022-082615335300-102, granted by the National Institute of Copyright. ISSN: 2683-2623. Person responsible for the most recent update of this issue: Edna María Villarreal Peralta, PhD. Date of last update: November 15th, 2024.

Distributor: Universidad de Sonora, Blvd. Luis Encinas and Av. Rosales s/n, Building 10J, ground floor, Col. Centro. Hermosillo, Sonora, Mexico.
Tel. +52 (662) 259-21-66.

Content

Cover and design: Universidad de Sonora.
Interior design: Andrés Abraham Elizalde García.

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Opportunity Areas and Best Practices in Procurement Management in Metallurgical Companies in Gomez Palacio, Durango, Mexico

Áreas de oportunidad y mejores prácticas en la gestión de compras en empresas metalmecánicas de Gómez Palacio, Durango, México

Date received: August 2, 2023 Date of approval: December 4, 2023

Liliana Angélica Guerrero Ramos[1], José Luis García Zamarripa[2], José de Jesús Espinoza Arellano[3]

[1] PhD in Information Sciences from Universidad de la Habana. Research Professor at the Faculty of Accounting and Administration, Universidad Autonoma de Coahuila. Torreon Unit. National Researcher Level I in SNI-CONACYT.
Email: dralilianaclases@gmail.com ORCID: https:// 0000-0001-7030-3101

[2] Master's in Administration and Senior Management from Universidad Autonoma de Coahuila. CONACYT Fellow in the Doctorate in Administration and Senior Management at the Faculty of Accounting and Administration, Universidad Autonoma de Coahuila.
Email: joselgarciaz@hotmail.com ORCID: https://0000-0002-8808-6093

[3] Corresponding author: PhD in Agricultural Economics from Texas A&M University, College Station, TX. Research Professor at the Faculty of Accounting and Administration, Universidad Autonoma de Coahuila, Torreon Unit. National Research I in SNI-CONACYT.
Email: jesusespinoza_612@yahoo.com.mx ORCID: https://0000-0003-0858-3987

Abstract

The objective of this work was to identify areas of opportunity in the management of purchases, its operations, and functions in small and medium-sized enterprises in the metalworking sector of Gómez Palacio, Durango, Mexico. The hypothesis proposed was that there are practices in the purchasing area that are managed inefficiently and represent areas of opportunity for improvement, thereby contributing to enhancing the effectiveness and efficiency of the supply chain. To gather the necessary information, a questionnaire designed on Google Forms was applied to a non-probabilistic sample of 13 metalworking companies in the city of Gómez Palacio, Durango, Mexico. Statistical analysis was carried out using the non-parametric Kruskal-Wallis test for small samples and the Chi-square statistic. The maturity test of the practices was performed using the SCOR model (Supply Chain Operations Reference Model). The results, obtained through the identification of weaknesses in the process, allowed for the identification of areas of opportunity in some purchasing practices, as well as specific areas of opportunity for the 13 companies studied.

Keywords: Degree of Maturity, Supply Chain, Purchasing, Supplier Selection

JEL Codes: M21

Resumen

El objetivo de este trabajo fue identificar áreas de oportunidad en la gestión de compras, sus operaciones y funciones en pequeñas y medianas empresas del sector metalmecánico de la ciudad de Gómez Palacio, Durango, México. Se planteó la hipótesis de que existen prácticas en el área de compras que se gestionan de manera deficiente y que representan áreas de oportunidad para su mejora contribuyendo con ello a mejorar la eficacia y la eficiencia de la cadena de suministro. Para obtener la información necesaria se aplicó un cuestionario diseñado en Google forms a una muestra no probabilística de 13 empresas del ramo metalmecánico de la ciudad de Gómez Palacio, Durango., México. El análisis estadístico se realizó con la prueba no paramétrica para muestras

pequeñas Kruskal-Wallis y el estadístico Chi cuadrado. La prueba de maduréz de las prácticas se realizó con el uso del modelo SCOR (Supply Chain Operations Reference Model. Los resultados, obtenidos a través de la identificación de debilidades en el proceso, permitieron encontrar áreas de oportunidad en algunas prácticas de compras, asi como también áreas de oportunidad específicas para las 13 empresas estudiadas.

Palabras Clave: Grado de Madurez, Cadena de Suministro, Compras, Selección de Proveedores

Códigos JEL: M21

Introduction

The metalworking industry is a fundamental link in the national production framework, providing key machinery and supplies to economic activities such as construction, automotive, mining, and aerospace, among others. In this sense, the metalworking industry has a decisive impact on job creation, requiring a variety of specialists, including operators, mechanics, technicians, welders, electricians, turners, and post-graduate experts, among others (CONACYT, 2020a).

The metalworking industry in Gómez Palacio, Durango, is strategically positioned in terms of connectivity, which allows it to serve as a logistical distribution hub that encourages capital investment in companies within the sector. It is important to highlight the significance of the metalworking experience in the region of study, where important manufacturing groups are dedicated to the production of steel pipes with oilfield specifications, bodywork, metal forms, and export metal furniture (CONACYT, 2020b).

The increasing complexity of supply chains (SC) creates the need to measure and monitor their functioning to assess performance (Vinajera, Marrero, & Crespón, 2020). Purchasing is an essential part of a company as it impacts the organization's ability to achieve its strategic projects (Porter, 1982). Manene (2014) refers to "purchasing" as a key activity for organizations, where inputs are transformed into finished goods, contributing to profitability since purchased materials represent 40-60% of the value of the final product sales. Among the objectives of purchasing management are cost reduction, obtaining quality inputs and services, and thereby achieving profitability and process efficiency (Álzate, 2017).

It is necessary to seek the optimization of supply chain functions, including purchasing, which trigger the effective use of time to contribute to the elimination of unnecessary activities and enhance the profitability of resources. Several factors can lead to deficiencies in the process, such as poor information management, lack of process control, insufficient staff training, poor planning, inadequate communication, and others. These issues can result in customer and process non-compliance, low product quality, inadequate inventories, high costs, and delays in activities, among others.

In recent years, the use of the SCOR model has increased for supply chain management. SCOR® (Supply Chain Operations Reference Model) is a product of the APICS Supply Chain Council (APICS SCC) (APICS, 2021), whose tools for methodology, diagnostics, and benchmarking help organizations diagnose and, if necessary, make changes in their supply chain processes. Among other functions, it allows for diagnosing the maturity level of purchasing practices and supports communication among supply chain partners to improve efficiency and related activities.

The aim of this study was to identify areas of opportunity in the management of purchases, operations, and functions in small and medium-sized metalworking enterprises in the city of Gómez Palacio, Durango, Mexico. The identification of these areas of opportunity was based on an analysis of how purchases and material sourcing are managed, as well as the measurement of the maturity level at which they are carried out. The hypothesis suggests that there are inefficient purchasing practices that represent areas of opportunity for improvement, contributing to enhancing the efficiency of the supply chain.

Literature Review

In the area of purchasing, Chai & Ngai (2020) state that supplier selection is a sophisticated problem, oriented toward application and decision-making, which is why it has received significant attention. The complexity of supply chains increased due to the global pandemic, which, regardless of the

strategy, resulted in losses beyond the anticipated effects (Kano, Tsang, & Yeung, 2020). Kusrini, Rifai & Miranda (2019) assert that measuring supply chain performance using the SCOR model can lead to process improvements, including purchasing, to enhance market competitiveness. Rizkya et al. (2019) highlight that SCOR is a method proposed by the Supply Ikatrinasari et al. (2020) recommend improving the supply chain with performance measurement results using four criteria: 1) Reliability criterion: order fulfillment compliance, 2) Responsiveness criterion: order fulfillment cycle time, 3) Cost criterion: cost of goods sold, and 4) Asset criterion: effective cycle time.

According to APICS (2021), best practices to evaluate are the maturity level based on the Supply Chain Operations Reference (SCOR) model to determine performance metrics such as planning, sourcing, manufacturing, delivering, returning, and enabling, as well as their performance attributes, namely reliability, responsiveness, agility, cost, and asset management efficiency.

To measure performance, it is necessary to define the objectives pursued in the supply chain processes (Masi, Day & Godsell, 2017). Moreover, Perdana, Usman & Arifiya (2020) define that mapping the supply chain practices of the company is based on SCOR, which serves, among other things, to identify risks, their severity, occurrence, and correlation.

Arone and Ganoza (2020) used the SCOR model for supply chain management in a transportation company. Based on the model's results, they made improvement recommendations to enhance the company's competitiveness. Buitrago et al. (2021) reported deficiencies in the processes of a company, from the logistics of sourcing raw materials to the delivery of the product to the final customer. With the results obtained, a strategy was launched to adjust processes with the aim of organizing, optimizing, and ensuring the management of acquisition and distribution of goods. Cruz (2019) analyzed the supply chain of a pharmaceutical franchise to reduce stockout rates through a proposal based on the SCOR methodology.

Ancajima et al. (2020) argue that proper supply chain management leads to greater efficiencies in an organization's production chain. They used the SCOR model, which enabled them to assess the diagnosis of the five supply chain processes at Nobex Foods S.A. Moreno and Fuentes (2017) applied the planning function of the SCOR model in the manufacturing sector of Bogotá, Colombia. This study also applied the SCOR model to the manufacturing sector in the city of Gómez Palacio, Durango, Mexico.

Bonifacio (2020) mentions that poor coordination and deficiencies in purchasing functions are reflected in poor process management between the sales and distribution areas. This miscoordination causes incorrect, duplicated, and crossed orders. This can be corrected by applying the SCOR methodology, which, through diagnostics, analyzes the strengths and weaknesses of the supply chain process or processes.

Methodology

The research design used in this study was non-experimental, with a mixed approach, meaning both qualitative and quantitative. The qualitative approach was utilized with a set of 11 open-ended questions employed to evaluate the maturity of purchasing practices, comparing what was evidenced through interviews and the ideal, as established by experts, according to the SCOR methodology (APICS, 2021).

The SCOR model consists of a set of standardized processes and activities with common terminology, best practice information, and references to software tools and their suppliers. The SCOR model allows for describing the business activities necessary to meet customer demand and is organized around five main management processes: Planning (Plan), Sourcing (Source), Manufacturing/Service (Make), Delivery (Deliver), and Return (Return).

The model provides a unique framework that combines Business Processes, Management Indicators, Best Practices, and Technologies into a unified structure to support communication between Supply Chain Partners and improve Supply Chain Management efficiency.

On the other hand, the quantitative approach was used to measure purchasing management through the use of items evaluated on a Likert scale and analyzed with inferential statistics using the non-parametric Kruskal-Wallis test and the Chi-square statistic (Levin and Rubin, 2010). The Kruskal-

Wallis test is the non-parametric equivalent of one-way analysis of variance (ANOVA) and detects differences in the distribution location. Non-parametric tests analyze data that do not require a normal distribution or homogeneity of variances (Lind, Marchal, and Mason, 2004).

In both approaches, a questionnaire was applied to a non-probabilistic sample of 13 small and medium-sized companies in the metalworking sector of Gómez Palacio, Durango, Mexico. The 13 companies are registered in the National Directory of Economic Units (DENUE) of INEGI. The instrument was developed using the Google Forms tool and was sent to the purchasing managers electronically due to the COVID-19 health contingency.

The questionnaire was divided into three sections: 1) general company data, 2) direction (strategic planning, guidelines, and organization), and 3) purchasing practices and supply chain measurement. In this study, the results of section 3 focused on purchasing management were analyzed. The validity and reliability of the instrument were evaluated using Cronbach's alpha (α) statistic.

The minimum acceptable value for Cronbach's alpha coefficient is 0.70; below this value, the internal consistency of the scale used is low. The maximum expected value is 0.90; above this value, redundancy or duplication is considered (Lind, Marchal, and Mason, 2004). In evaluating the instrument used in this study, a value of 0.88 was obtained, indicating that the instrument is reliable. An instrument is reliable when it is consistent in its application, meaning that the results of the test are the same when applied a second time to the same subjects (test-retest or equivalent test).

Table 1 shows the variables analyzed in the study and their measurement scale. The purchasing management variables and the operations and functions variables were evaluated using the Likert scale to capture the perceptions of the interviewees. With the values obtained, their means were calculated and compared using the Kruskal-Wallis test and the Chi-square statistic with a significance level of $\alpha = 0.05$ to analyze potential statistical differences. The practices were valued differently, highlighting those with low values, which, for this study, represented areas of opportunity for improvement. In the case of the better-evaluated practices, they should be maintained to ensure efficient purchasing processes.

As mentioned above, the maturity evaluation of purchasing practices was carried out using the SCOR methodology (APICS, 2021). A set of 25 practices related to the purchasing area were selected from the SCOR catalog. Practices in the supply chain that do not relate to the purchasing area were not considered for this study. Based on the responses obtained, purchasing practices were classified into five categories according to their development or maturity level (Table 2): (a) Primitive practices, (b) Ascending practices, (c) Standard practices, (d) Improved practices, and (e) Emerging practices. The development level of each practice (last column) was based on the classification proposed by SCOR, and the rating (1 to 5) was according to Lockamy and McCormack (2004) to quantify the maturity level of each purchasing practice, as well as of the 13 companies studied.

Table 1. Study Variables and Measurement Scale

Subsection	Scale	Variables
Purchasing Management	LIKERT SCALE (Level of agreement, from Strongly Agree to Strongly Disagree)	Material requirements, response time to users, budget, supplier evaluation, quotation methods, supplier delivery time, product recipt according to specifications, use of software, years of buyer experience.
Operations and Functions in Purchasing	LIKERT SCALE (Always to Never)	Applications in the company related to demand planning and forecasting, projects, information and communication technologies, training of purchasing staff, supplier classification, key performance indicators, risk assessment, and predictive analysis.
Best Practices (SCOR)	Open-ended questions, qualitative approach, perception.	Indicators of how raw materials are planned and sourced for demand, alignment of production plans with mechanisms and strategies, evaluation for supplier selection, optimization of inventory, costs, and processes for the flow of raw material sourcing.

Table 2. Evaluation and maturity levels of different purchasing practices in the studied companies.

Definition	Rating	Level
(a) Primitive Practices: The processes are not structured and are poorly defined. There are no process measurements, and organizational functions and structures are based on traditional roles, not horizontal processes.	1	Ad Hoc
(b) Ascending Practices: These represent business methods that can be generalized and have shown poor supply chain performance as a result. Basic processes are defined and documented.	2	Defined
(c) Standard Practices: These have been historically practiced by a wide range of companies either by default or by accident. Managers employ intentional management and strategic outcomes. They are implemented in broad job roles and structures outside traditional functions.	3	Linked
(d) Improved Practices: These are current, structured, and repeatable practices that have had a proven positive impact on supply chain performance.	4	Integrated
(e) Emerging Practices: These are practices where companies introduce new technology, knowledge, or radically different ways of organizing processes, with a culture of horizontal collaboration and competition based on multi-enterprise networks.	5	Extended

Results and Discussion

Measurement of the Application of Purchasing Management

Figure 1 shows the results of measuring the implementation of 14 supply chain purchasing management practices. These practices were taken from the "best practices" in the purchasing section of the SCOR methodology (APICS, 2021). The three lowest-rated practices were: "our company has actively collaborated in group purchasing organizations" (2.77) (Practice 1), "the purchasing department has developed supplier classification according to their level of importance (ABC)" (3.23) (Practice 2), and "predictive analysis practices have been implemented in the purchasing area of our company" (3.46) (Practice 3).

On the other hand, the three highest-rated practices were (Figure 1): "our purchasing function has used information and communication technologies for supply management" (4.38) (Practice 12), "our company's purchasing function has worked on specific joint projects with other company functions/departments/processes that require high collaboration and communication" (4.38) (Practice 13), and "our company's purchasing function has participated in strategic management processes" (4.46) (Practice 14).

However, to test whether the differences between the means were statistically significant, the Kruskal-Wallis test was applied. According to the significance level ($p<0.05$), the null hypothesis of equality of means was rejected, and the research hypothesis that at least one mean was different was accepted.

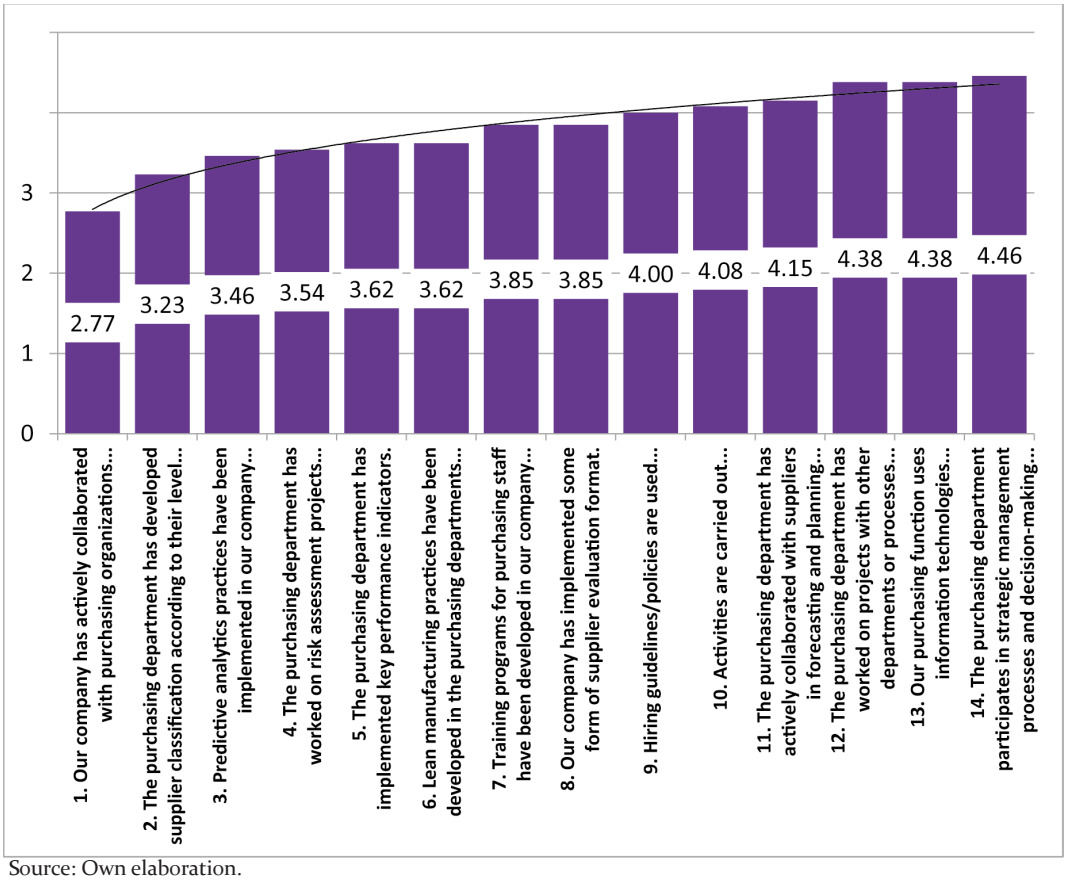
Subsequently, a post hoc test was conducted to compare all means against each other, obtaining the following results: Practice 1 was statistically equal ($p>0.05$) to Practices 2, 3, and 4, but different ($p<0.05$) from Practices 5 to 14 (Figure 1). Practice 2 was statistically equal ($p>0.05$) to Practices 1 to 11 but different ($p<0.05$) from Practices 12, 13, and 14.

Practices with low evaluations present areas of opportunity to improve processes. Improvement opportunities are mainly perceived in actively collaborating in organizations for group purchasing (Practice 1) and conducting supplier classification activities (Practice 2); to a lesser extent, in predictive analysis in the purchasing area (Practice 3) and in risk assessment projects (Practice 4). Practices from 5 onwards, which were highly rated, only need to be maintained.

Evaluation of Purchasing Management

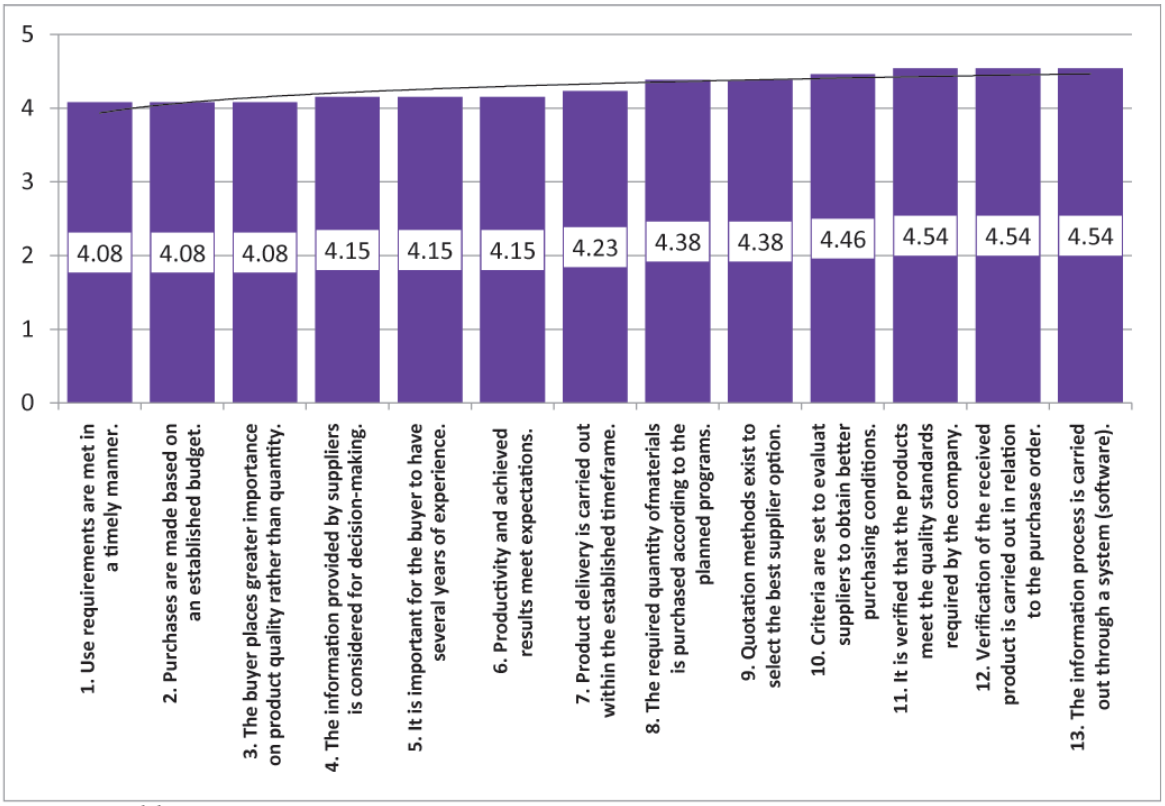
Figure 2 presents the results of the evaluation of 13 supply chain purchasing management practices. The results of applying the Kruskal-Wallis test indicate that the null hypothesis of equality of means is not rejected ($p>0.05$). This means that the interviewees

Figure 1. Evaluation of Purchasing Management in Metal-Mechanical Companies in Gomez Palacio, Durango.



Source: Own elaboration.

Figure 2. Evaluation of Purchasing Management in the Supply Chain.



Source: Own elaboration.

— purchasing managers — stated that they perform the different practices in their companies with the same frequency.

However, as a "trend", three purchasing practices were identified that require greater attention, as they obtained the lowest evaluation scores (4.08 each). These practices are: "user requirements are met in a timely manner (Practice 1)", "purchases are made based on an established budget (Practice 2)", and "the buyer gives more importance to product quality than to quantity (Practice 3)". This result suggests that there is a need to improve responsiveness to user requirements, to carry out purchasing planning based on a budget, and to consider that customers value not only the quality but also the quantity of supplies.

Conversely, the three highest-rated practices (4.54 each) were: "products are verified to meet the quality standards required by the company (Practice 11)", "verification of the received product is carried out in relation to the purchase order (Practice 12)", and "the information process is carried out through a system (Practice 13)". These practices should be maintained, as they are essential for the purchasing department's contribution to the competitiveness of the supply chain.

Evaluation of the Maturity of Best Practices in Purchasing Management

Based on the application of the research instrument in the 13 participating companies, the purchasing practices used and their level of maturity were identified. As mentioned above, the maturity assessment was based on SCOR, which is a supply chain operations reference model. In this study, the performance of best practices was evaluated for the processes related to suppliers and manufacturers, selecting 25 best practices (BP) linked to purchasing, procurement, and supply management.

The practices considered for analysis were the following: BP.097 Supplier Research; BP.100 Strategic Sourcing; BP.147 Goods Reception Inspection; BP.068 Supplier Delivery Performance Analysis; BP.128 Supplier Recovery; BP.060 Corrective Action on Order Delivery Time; BP.056 Improvement of Supplier Raw Material Quality; BP.134 Supplier Evaluation; BP.162 Long-term Supplier Partnership Agreement; BP.021 Global Production/Sales Planning (Demand); BP.042 Periodic Review of Procurement Conditions; BP.015 Safety Stock Planning; BP.069 Raw Material Receiving Process; BP.129 Return Policy Included with Shipping Document; BP.144 Purchase Order Management; BP.161 Enterprise-wide Spend Analysis; BP.016 Supply Network Planning; BP.034 Inventory Planning with Supplier Collaboration; BP.030 Inventory Record Accuracy; BP.087 ABC Inventory/Supplier Classification; BP.033 Improvement of Traditional Demand Forecasting; BP.140 Return Authorization Required; BP.145 Supplier Collaboration; BP.059 Employee Incentives for Effective Inventory Management; and BP.091 Job Load Evaluation.

The practices were classified and evaluated according to their level of development or maturity as follows: Primitive Practices (1), Emerging Practices (2), Standard Practices (3), Improved Practices (4), and Leading Practices (5). Practices with a score closer to 5 represent a higher level of maturity (Table 2). "Low maturity" processes are characterized by obsolete practices and/or a lack of discipline and consistency. "High maturity" processes frequently employ best practices and are implemented with a high degree of discipline and compliance. Table 3 shows the results found in this study. The maturity levels of both practices and companies were evaluated. In the case of companies, they were identified with letters from A to M to protect their privacy in accordance with the confidentiality agreement. Companies with higher scores show a higher level of development in the application of purchasing best practices.

The worst evaluated practices were BP.162 "Long-term Supplier Partnership Agreement" with a score of 2.08 (scale 1-5); BP.087 "ABC Inventory/Supplier Classification" with 2.62; and BP.059 "Employee Incentives for Effective Inventory Management" with 2.77. These practices are classified between "Improved Practices" and "Standard Practices" (Table 2) and present areas of opportunity for improvement in establishing long-term agreements with suppliers, performing inventory/supplier classification, and creating employee incentives for better inventory management.

On the other hand, the best evaluated practices were BP.140 "Return Authorization Required" with an average score of 4.0, BP.147 "Goods Reception Inspection" and BP.069 "Raw Material Receiving Process," both with an average score of 3.92. These three evaluations are related to the processes of receiving and returning goods, and in general, companies are performing them well, so they should simply be maintained. These practices are classified as "Improved Practices" (Table 2), which are current, structured, and repeatable practices that have had a proven and positive impact on supply chain performance.

Table 3. Evaluation of the Maturity of Best Practices in Purchasing Management in Metal-Mechanical Companies of Gomez Palacio, Durango.

Companies:	H	I	L	G	E	M	K	B	C	A	F	J	D	Avg.
BP.140 Return authorization required	5	4	4	4	4	4	4	4	4	4	4	4	3	4.00
BP.147 Goods inspection reception	4	4	3	4	4	4	4	4	4	4	4	4	4	3.92
BP.069 Raw material reception process	4	4	3	4	4	4	4	4	4	4	4	4	4	3.92
BP.056 Improvement of suppliers' raw material quality	4	4	4	4	4	3	4	3	4	4	4	4	4	3.85
BP.129 Return policy included with the shipping document	4	5	4	4	4	4	4	4	4	4	4	4	1	3.85
BP.144 Purchase order management	4	4	4	4	4	4	4	4	4	4	4	2	4	3.85
BP.030 Inventory record accuracy	4	4	4	4	2	4	4	4	4	4	4	4	4	3.85
BP.097 Supplier research	4	4	3	4	4	4	4	4	3	4	4	4	3	3.77
BP.068 Supplier delivery performance analysis	4	4	3	4	4	4	4	4	3	4	4	4	3	3.77
BP.042 Periodic review of procurement conditions	4	4	4	4	4	2	4	4	4	1	3	4	3	3.46
BP.161 Company-wide expense analysis	4	4	4	4	4	4	4	3	3	4	3	3	2	3.54
BP.016 Supply network planning	4	4	4	4	4	4	4	3	3	4	3	3	2	3.54
BP.060 Corrective action on order lead time	4	4	4	4	4	3	3	3	3	4	3	3	3	3.46
BP.015 Safety stock planning	4	4	4	3	3	3	4	4	4	1	4	4	3	3.46
BP.034 Extend inventory planning using supplier collaboration	4	4	3	3	4	3	4	4	1	1	4	4	3	3.23
BP.100 Strategic sourcing	4	4	4	3	4	4	3	2	3	4	1	3	1	3.08
BP.021 Global production/sales (Demand) planning	4	4	4	3	4	4	3	2	3	4	1	3	1	3.08
BP.033 Improve traditional demand forecasting	4	4	4	3	4	4	3	2	3	4	1	3	1	3.08
BP.145 Supplier collaboration	4	4	4	3	4	4	3	2	3	4	1	3	1	3.08
BP.128 Supplier recovery	4	4	4	3	4	2	3	4	3	1	3	3	1	3.00
BP.134 Supplier evaluation using robust assessment tools	4	4	4	3	4	2	3	4	3	1	3	2	1	2.92
BP.091 Job workload evaluation	4	4	4	4	3	4	2	2	3	3	2	1	1	2.85
BP.059 Employee incentives for effective inventory management	4	3	4	4	3	3	1	3	3	3	3	1	1	2.77
BP.087 ABC inventory/supplier classification	3	1	4	4	3	2	2	3	3	3	4	1	1	2.62
BP.162 Long-term supplier partnership agreement	2	3	1	4	2	2	1	3	3	2	2	1	1	2.08
Average Maturity	3.9	3.8	3.7	3.7	3.7	3.4	3.3	3.3	3.3	3.2	3.1	3.0	2.2	3.36

Source: Own elaboration.

Regarding the companies evaluated, the best-rated were companies H and I, with average scores of 3.9 and 3.8, respectively (Table 3). However, these companies presented some low scores in the practices BP.087 "Inventory/Supplier Classification" and BP.162 "Long-term Partnership Agreement with Suppliers", which represent specific areas of opportunity for improvement.

On the other hand, the worst-rated companies were J and D, particularly in the practices BP.091 "Workload Evaluation", BP.059 "Employee Incentives for Effective Inventory Management", BP.087 "Inventory/Supplier Classification", and BP.162 "Long-term Partnership Agreement with Suppliers". These practices were rated at level 1, corresponding to "Primitive Practices", which are described as processes that are unstructured and poorly defined, with no performance measurements, and where functions and organizational structures are based on traditional roles rather than horizontal processes. Therefore, these four practices represent critical areas of improvement for companies J and D.

In general, most of the companies are at level 4, called "Improved Practices", which are current, structured, and repeatable practices that have shown a proven positive impact on supply chain performance. However, there is potential for them to advance to level 5, "Emerging Practices", where companies introduce new technology, knowledge, or radically different ways of organizing processes, fostering a culture of horizontal collaboration, and where competition is based on multi-company networks. Moving towards this level would allow companies to develop greater efficiency to survive in an increasingly competitive environment.

In a previous study, Cruz (2019) found deficiencies in the following practices within the companies analyzed — in research similar to the present work: 1) The management of consignment inventory, where the supplier manages within the company's warehouses the raw materials owned by them to be consumed according to needs; and at the same time, the practice of bidding processes to obtain raw materials at lower costs; 2) Processes still follow a manual and mechanical course, showing an area of opportunity to improve automation levels through the use of technology in inventory management and the systematization of procedures; and 3) The level of coordination and planning of the supply chain is incipient, without reaching an optimal level. Although the type of companies analyzed in that study belonged to the pharmaceutical sector, in the metal-mechanical sector —the object of this study— similar problems were also found in inventory management, identifying areas of opportunity in process automation through the use of information technologies.

Similarly, García (2018) found that companies that use ICT in their production processes or in their relationship with the final customer can improve their competitive position and obtain better operational and financial results. The improvement resulting from the introduction of ICT can generate better outcomes for companies, especially when applied specifically to the supply chain. Many authors have analyzed the influence of ICT through the theory of transaction costs or the resource-based view; however, few have empirically tested their impact on results, as García (2018) did.

By applying the SCOR methodology in this research, and considering the complexity of the metal-mechanical industry —which has a high level of foreign suppliers— it was possible to identify areas of opportunity, as presented in the following conclusions.

Conclusions

1. Purchasing management within the supply chain is a highly important process because it improves its effectiveness and efficiency by reducing and controlling costs, ensuring the supply of the required quantities in terms of time, quality, and price. Therefore, it is essential to identify areas of opportunity for its improvement.

2. In the measurement of purchasing management, among the 14 activities evaluated, the two that represent the greatest areas of opportunity are the need to carry out group purchasing to generate economies of scale, and the classification of suppliers to select those most reliable in terms of quality, timeliness, and compliance with orders or contracts. To a lesser extent, it is also worth mentioning the need to conduct predictive analyses (forecasts) in the purchasing area and to develop projects focused on risk assessment and mitigation within the purchasing process.

3. In the evaluation of 13 purchasing management practices within the supply chain, the results indicate that there were no statistically significant differences among them. However, there is a perceived "tendency" towards lower evaluation scores in some practices that generate areas of opportunity, such as: the need to improve responsiveness to user requirements, to carry out purchasing planning based on a budget, and to consider that customers value not only the quantity but also the quality of the supplies.

4. The maturity level of 25 best practices related to purchasing, procurement, and supply management was also evaluated. The "low maturity" processes are characterized by obsolete practices and/or a lack of discipline and consistency. In contrast, "high maturity" processes frequently employ best practices and are implemented with a high degree of discipline and compliance. The practices with the lowest maturity level reveal areas of opportunity for improvement in the purchasing process, among which the following stand out: establishing long-term partnership agreements with suppliers, carrying out inventory/supplier classification, and applying employee incentives for effective inventory management.

5. The individual performance of the 13 companies participating in this study was also evaluated. Most of the companies are at level 4, known as "improved practices", which are practices that have had a proven and positive impact on supply chain performance. However, some companies received low evaluations because they implement "primitive practices", described as processes that are not structured and are based on traditional functions, which indicates that there is still much room for improvement.

References

Ancajima, A., Flavia, A., Rosas, L. S. A. L. Y., Zayuri, M., Quiroz, S., & Selene, E. (2020). FACULTAD DE GESTIÓN Y ALTA DIRECCIÓN Análisis y propuesta de mejora de la gestión de la cadena de suministro de una empresa del sector olivícola . Caso de estudio : Nobex Foods S . A. Recuperado de: https://tesis.pucp.edu.pe/repositorio/handle/20.500.12404/18271?show=full

Álzate, J. (2017). Propuesta de mejoramiento en el area de compras de la empresa construccion, reingenieria, producción. (c.r.p). S.A.S.. Universidad Autonoma de Occidente, en la Cuidad de Santiago de Cali (1Aa), 1–106. Recuperado de: https://red.uao.edu.co/handle/10614/9520

APICS. SCOR Supply Chain Operations Reference Model. 2021. Available online: http://www.apics.org/docs/default-source/scor-training/scor-v12-0-framework-introduction.pdf?sfvrsn=2 (accessed on 21 May 2023).

Arone, C. E., y Ganoza, J. C. (2020). Análisis del Modelo SCOR en la Gestión de la Cadena de Suministros de una empresa de transporte en Arequipa 2018-2019, Escuela de post grado y estudios continuos. Universidad Privada del Norte, Arequipa, Lima, Peru. Recuperado de: https://alicia.concytec.gob.pe/vufind/Record/UUPN_1da33eae25120819636211 62dcebd6ce/Details

Bonifacio, L., (2020). Evaluación del desempeño del aprovisionamiento de una concesionaria de vehículos en lambayeque empleando el modelo Scor, Facultad de Ciencias Empresariales de la Universidad Católica Santo Toribio de Mogrovejo. Recuperado de: https://tesis.usat.edu.pe/handle/20.500.12423/2661

Buitrago, D., Castrillon, G., Hernández. Y., Robayo, D. y Piñeros, C., (2021). Propuesta en Supply Chain Management y Logística en la empresa ZARA U Universidad Nacional Abierta y a Distancia – UNAD

Chai, J., & Ngai, E. (2020). Decision-making techniques in supplier selection: Recent accomplishments and what lies ahead. Expert Systems with Applications, 140, 112903. https://doi.org/10.1016/j.eswa.2019.112903

CONACYT. (2020a). Fondos-y-apoyos/programa-de-estimulos-a-la-innovacion. Información obtenida de: http://www.conacyt.mx/index. php/

CONACYT. (2020b). Agenda de Innovación de Durango. CONACYT. www.agendasinnovacion.org. Recuperado de https://www.agendasinnovacion.org/wp-content/uploads/2015/03/Agenda-de-Innovaci%c3%b3n-Durango.pdf

Cruz, A. (2019). Análisis de la cadena de suministro utilizando el modelo SCOR para la reducción de los índices de quiebre de inventarios de una empresa farmacéutica. Tesis Doctoral. Universidad de Guayaquil. Facultad de Ingeniería Industrial. Recuperado de: http://repositorio.ug.edu.ec/handle/redug/51947

García, A. J. (2018). Gestión de la cadena de suministro: análisis del uso de las TIC y su impacto en la eficiencia. Tesis Doctoral. Universidad Complutense

de Madrid. Recuperada de: https://eprints.ucm.es/id/eprint/46224/1/T39544.pdf

Ikatrinasari, Z. F., Harianto, N., & Yuslistyari, E. I. (2020). Improvement of supply chain pelkatrinasari, Z. F., Harianto, N., & Yuslistyari, E. I. (2020). Improvement of supply chain performance of printing services company based on supply chain operation references (Scor) model. Uncertain Supply Chain Management, . Uncertain Supply Chain Management, 8(4), 845–856. https://doi.org/10.5267/j.uscm.2020.6.001

Kano, L., Tsang, E. W. K., & Yeung, H. W. (2020). Global value chains: A review of the multi-disciplinary literature. Journal of International Business Studies, 51(4), 577–622. https://doi.org/10.1057/s41267-020-00304-2

Kusrini, E., Rifai, M. A. B., & Miranda, S. (2019). Performance measurement using supply chain operation reference (SCOR) model: A case study in a small-medium enterprise (SME) in Indonesia. IOP Conference Series: Materials Science and Engineering, 697(1). https://doi.org/10.1088/1757-899X/697/1/012014

Levin, R. y Rubin, D. 2010. Estadística para Administración y Economía. Ed. Pearson. 7ª edición revisada. México, D.F. 799 p.

Lind, D., Marchal, W., y Mason, R. 2004. Estadística para Administración y Economía. Ed. Alfaomega. 11a edición. México, D.F. 830 p.

Lockamy, A., y McCormack, K. (2004). The development of a supply chain management process maturity model using the concepts of business process orientation. Supply Chain Management: An International Journal, 9(4), 272-278. doi: 10.1108/1359854041055001

Manene Cerrageria, L.M. (2014) Dirección de compras: su importancia, desempeño e interrelaciones. Actualidad empresa 2019. Recuperado de http://actualidadempresa.com/direccion-de-compras-su-importancia-desempeno-e-interrelaciones/

Masi, D., Day, S., & Godsell, J. (2017). Supply chain configurations in the circular economy: A systematic literature review. Sustainability (Switzerland), 9(9). https://doi.org/10.3390/su9091602

Moreno Ramírez, M. A., & Fuentes, M. N. (2017). Función De La Planeación En El Modelo Scor, Caso: Empresas De Familia Del Sector De Alimentos. Universidad De La Salle, 1–23. Recuperado de: https://ciencia.lasalle.edu.co/administracion_de_empresas/1399/

Perdana, S., Usman, R., & Arifiya, N. (2020). Analysis of Perdana, S., Usman, R., & Arifiya, N. (2020). Analysis of supply chain risk mitigation strategies in the Bogor compressor company with the house of risk method. IOP Conference Series: Materials Science and Engineering, 852(1). https://doi.org/. IOP Conference Series: Materials Science and Engineering, 852(1). https://doi.org/10.1088/1757-899X/852/1/012094

Porter, M. E., (1982) Competitive Advantage of Nations, Prentice-Hall, New York, NY

Rizkya, I., Syahputri, K., Sari, R. M., Siregar, I., & Utaminingrum, J. (2019). SCOR: Business Process Analysis and Supply Chain Performance in Building Materials Industry. IOP Conference Series: Materials Science and Engineering, 598(1). https://doi.org/10.1088/1757-899X/598/1/012070

Vinajera, A., Marrero, F., & Cespón, R. (2020). Evaluación del desempeño de la cadena de suministro sostenible enfocada en procesos. Estudios Gerenciales, 36(156), 325–336. https://doi.org/10.18046/j.estger.2020.156.3699. Recuperado de: https://www.icesi.edu.co/revistas/index.php/estudios_gerenciales/article/view/3699

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Identifying Economic Activities in Restructuring. A Study of Economic Trajectories in the Guadalajara Metropolitan Area from 1998 to 2018

Identificación de actividades económicas en restructuración. Un estudio de trayectorias económicas en la Zona Metropolitana de Guadalajara de 1998 al 2018

Date received: February 06, 2024

Noé René Luna Plascencia[1]

Date of approval: April 23, 2024

[1] Bachelor's degree in Economics, Master's degree in Business and Economic Studies, and PHd in Geography and Territorial Planing from Universidad de Guadalajara (UdeG). Adjunct professor B and secretary of the mathematics academy in the Department of Quantitative Methods at UdeG.
Email-address: noe.luna@cucea.udg.mx ORCID: https://orcid.org/0000-0002-5509-293X

Abstract

This study analyzed economic sectors related to design, based on the assumption that design can enhance the competitiveness of products. This premise is supported by the economic crises that emerged in 2004 and 2008, ith a recovery at the aggregate level of the state economy only becoming evident in 2016. Aiming to highlight industrial dynamism, the findings emphasize that some sectors related to traditional and technology industries are undergoing economic restructuring towards expansion, while others are experiencing a decline. This is occurring in the context of economic liberalization and new agreements with China, which have led to a competitive confrontation between Chinese and Mexican products. Consequently, only those industries capable of adapting flexibly to change and restructuring their businesses will survive.

Keywords: Economic restructuring, economic trajectories and industrial dynamics.

JEL Classification: H32, L22, L52, L60

Resumen

En este trabajo se analizaron las ramas económicas relacionadas con el diseño, bajo el supuesto de que el diseño puede ayudar a la competitividad de los productos, esto se hace por los hechos derivados de las crisis económicas que surgieron en el 2004 y en el 2008, y que apenas en el 2016 se pudo observar una recuperación a nivel agregado de la economía estatal. Con el objetivo de resaltar el dinamismo industrial, los hallazgos/resultados destacan que algunas ramas relacionadas con las industrias tradicionales y de tecnología presentan una reestructuración económica hacia la expansión, mientras que otras están sufriendo un retroceso, esto bajo el escenario de los efectos causados por la aperturas económica y los nuevos acuerdos con China, que dieron como resultado una confrontación competitiva entre los productos chinos y los productos de México y aunado a esto solo sobrevivirán aquellas industrias que logren ser más flexibles al cambio y logren reestructurar su empresas.

Palabras clave: reestructuración económica, trayectorias económicas y dinámica industrial

Clasificación JEL: H32, L22,L52,L60

Introduction

Over time, economic, political, and social changes have shaped the structure and the rise or decline of the productive system in the Guadalajara Metropolitan Area (ZMG). Several studies have documented growth trajectories, such as Ortega (2012) Alonso y Carrillo (1996), who, based on typologies of employment and the electronics industry trajectories, respectively, provide a foundation for understanding economic evolution. To gain deeper insight into the evolution and structural transformations of the local productive system, it is essential to use a method that organizes

information to explain economic trajectories, patterns, and trends. Studies by Morales (2009), Cuadrado-Roura & Moroto-Sánchez (2012), Rendón, Rosales & Mejía (2019), propose analyzing employment and the added value in production. These researchers consider employment and add value as cumulative variables (such as the total number of occupied personnel or added value). However, it is no longer just about accumulation without spatial considerations—now, it is argued that the region also accumulates production factors and may, at some point, become more competitive. Additionally, regional specialization is defined as the set of most-utilized resources in a specific economic activity. For instance, the intensive use of human capital as a variable result in the generation of added value in a given economic sector. This outcome helps explain a region's growth or decline.

Growth or decline can also be influenced by the inclusion of both qualitative and quantitative variables, such as foreign direct investment (FDI), political changes, economic crises, and public and private financing support. Other factors that drive industry growth include political changes and the inclination of governments toward specific economic models, as these influence how production factors are organized. Such decisions may promote certain economic sectors while others deteriorate. This was the case in Mexico, particularly in Jalisco.

For example, in the late 1950s, the Economic Commission for Latin America and the Caribbean (ECLAC) proposed the import substitution model, which was based on three main justifications. First, economic growth was restricted by trade barriers imposed by other countries on manufactured goods, creating the need for an internal source of growth. Second, the industrial sector needed to expand employment faster than the labor force growth rate to provide better job opportunities for underemployed agricultural workers. Third, industrialization was state led, as it was seen as the only way to incentivize and drive technological progress (FitzGerald, 2003).

The implementation of this model resulted in significant state intervention in protecting domestic trade, developing both public and private industries, and investing in basic infrastructure primarily through public debt (Solis, 2000). During this period, industries flourished, and major companies such as Kodak, Motorola, and Euzkadi established operations in Guadalajara (Rodríguez, 2006). However, in the 1970s, the import substitution model was replaced by neoliberalism, allowing free entry of capital and products. This shift led to direct competition between international and national products, causing the closure of many businesses and increasing unemployment (Bernal, Rodríguez y Ortiz, 2020).

These changes occured nationwide, including in Jalisco. One major event was the transition of the state government from the Partido Revolucionario Institucional (PRI) to the Partido de Acción Nacional (PAN) with Carlos Rivera handing power over to Alberto Cárdenas. This represented a drastic shift, as the latter solidified economic liberalization and emphasized Foreign Direct Investment (FDI) to stimulate the economic dynamism of the Guadalajara Metropolitan Area (ZMG). However, FDI did not benefit all sectors equally, the electronics industry emerged as the winner, while traditional sectors were left behind. This shift in resource allocation favored export-oriented industries, leading to the decline of sectors that had existed for centuries in the ZMG.

Similarly, industrial policies and financial support for various sectors have led to a reconfiguration of how production factors are organized. The economic model now prioritizes activities that generate higher added value in national products (Palacios, 2008). This can be observed in initiatives driven by the Jalisco State Economic Promotion Council, which works to attract national and foreign investments and foster connections between producers, designers, and distributors. These connections facilitate value chain scaling, ultimately leading to the creation of greater added value.

The activities that facilitate value chain scaling include design, research, and development, which are integral to the technological maturation process. These activities focus on product quality and innovation through design. They are primarily found in industries such as apparel, furniture, household appliances, lighting, medical equipment, integrated circuits, and consoles. It is noted that the expected evolution of this type of manufacturing transitions from assembly to "modern manufacturing" (Alonso y Carrillo, 1996:61) meaning a shift from assembly to a restructured process incorporating creation, design, and innovation. This raises key questions: Which industries are undergoing economic restructuring? and Which industries have lost competitiveness amid rapidly changing economic conditions?

To explore these questions, the first section of this document reviews economic restructuring theories with contributions from various scholars. The next section outlines the methodology used in the study, followed by a presentation of the results. Finally, a brief conclusion highlights key points and suggestions for future research.

1. Economic Structuring

All the aforementioned industries (traditional, electronics, and services) have experienced varying degrees of growth due to government support, foreign direct investment, international organizations, and economic crises, which hae driven economic dynamics to greater or lesser extent. This transformation is reflected in two ways: 1) an increase in productivity and employment; and 2) an increase in international trade and Foreign Direct Investment (FDI). The first considers internal factors, while the second examines external influences.

These two factors lead to economic movements that are not always constant or smooth but instead follow cyclical patterns in productive activities (Vázquez, 2015). Companies must adapt to investment shifts, innovation, labor adjustments (outsourcing), reduced transportation costs, and global competition. As a result, some regions lead economic transformation processes by offering advanced services and undergoing structural changes (Vázquez, 2011).

Although economic growth impacts the structuring of the production system, it depends on the potential of a given territory, which is shaped by economic relationships and productive factors accumulated over time (Vázquez, 2015).

Cities, as units that can encompass territories, serve as both territorial entities (Maya 2006) and. organizational frameworks (Vázquez-Barqueo y Rodríguez Cohard 2019) As cities evolve into global hubs, their competitiveness and presence grow. However, before reaching that stage, they undergo restructuring, which tests the flexibility of businesses regarding innovation and human capital. Competitiveness in this process depends on transportation infrastructure, access to national and international markets through interconnected networks, and proximity to key markets (Vázquez-Barqueo y Rodríguez Cohard 2019).

In more dynamic regions, companies make investment decisions that reshape economic structures (Vázquez, 2015); Large corporations wield significant influence across multiple sectors, often sidelining fewer flexible industries that struggle to integrate into evolving market dynamics. In this context, state intervention plays a crucial role in fostering the development of priority sectors through various programs that facilitate economic restructuring (Hong, 2017).

Constantly increasing productivity is essential for business to boost profits (Hong, 2017), However, from a governmental perspective, expanding employment opportunities is a priority, as it allows more individuals to access stable incomes. When businesses face declining sales and production while maintaining the same workforce size, productivity decreases. To remain competitive, companies must reduce their workforce, cutting costs to improve efficiency, yet this leads to unemployment. Therefore, maintaining a vertical relationship between the state and businesses is crucial (Friedman y Kuruvilla, 2015). Otherwise, an inverse dynamic may emerge, where corporations dictate economic policies, limiting state support for employment, particularly during crises marked by declining sales and production.

Globalization is another key factor in economic restructuring, as foreign products can disadvantage domestic industries, particularly in strategic sectors (Hseuch, 2015). Contemporary literature also highlights the role of business and systemic managers, who enhance communication to drive radical restructuring (Isaksen, Jakobsen, Njos y Normann, 2018). This process is particularly significant in industries with limited expertise and continues in those with high specialization.

In the same sense, managers can be seen as internal or external actors who contribute to improving products in terms of aesthetics, functionality, and utility (OECD y Eurostat, 2018) They help reduce costs, time, and movements through the design of strategies and products via creative proposals. The OECD (2015. ′p. 262) defines design as “an innovation activity aimed at planning design procedures, technical specifications, and other functional and user characteristics for new products and business processes.” Design, together with new technologies such as digitalization, the use of software programs, and computer-aided design

(Azariadis et al 2018) enables the full use of design and digital technologies to become competitive advantages. Therefore, the use of design will support the restructuring of companies.

The efficient use of productive factors, adequate infrastructure within the territory, multiple networks among actors, the proximity of these elements and of the markets within the territory, along with the proper functioning of the State, would result (among other things) in the growth of the number of companies, employment, broader markets, increased investment, and improved infrastructure in response to growing demand from both civil society and businesses. As a result, demand rises for limited spaces dedicated to business activities, such as industrial parks. The aforementioned characteristics enhance some of the previously mentioned quantitative variables, though there are also other variables that may not necessarily be tangible.

2. Method

To provide a general overview of what has happened to the industries, a method developed by Morales (2009), based on Camagni and Capello (1997), is applied. This method estimates trajectories to determine whether economic sectors are undergoing restructuring or falling into decline, thus losing dynamism. The method uses two main variables: the number of employed personnel (EP) by economic activity and the Gross Census Value Added (GCVA), based on growth rates. The data for EP and GCVA were obtained from the economic censuses from 1998 to 2018 conducted by the National Institute of Statistics and Geography (INEGI), by economic sector, for the Guadalajara Metropolitan Area, which includes only the municipalities of Guadalajara, Zapopan, Tlaquepaque, Tonalá, Tlajomulco, and El Salto.

The variables calculated according to Morales (2009) are as follows:

$$\text{Labor Productivity} \quad \text{“P”} = \frac{\text{GCVA}}{\text{EP}} \quad (1)$$

Where GCVA is the Gross Census Value Added, and EP is the Employed Population. This applies to the branches by municipality and for the state entity of Jalisco.

$$TCRPO_{kj}^{i} = \frac{TCPOM_{kj}^{i}}{TCPOE_{k}^{i}} \quad (2)$$

Where:

$TCRPO_{k}^{i}$ is the relative growth rate of the employed population of sector k in municipality j during period i.

$TCPOM_{kj}^{i}$ is the growth rate of the employed population of sector k in municipality j during period i.

$TCPOE_{k}^{i}$ is the growth rate of the employed population of the state entity during period i.

$$TCRP_{kj}^{i} = \frac{TCPM_{kj}^{i}}{TCPE_{k}^{i}} \quad (3)$$

Where:

$TCRP_{k}^{i}$ is the relative growth rate of labor productivity of branch k in municipality j during period i

$TCPM_{kj}^{i}$ is the growth rate of labor productivity in municipality k during period i.

$TCPE_{k}^{i}$ is the growth rate of labor productivity of the federative entity during period i.

The combination of the previous rates results in different trajectories, with values either above or below one. This is summarized in the following matrix of economic trajectories (Table 1).

Table.1 Matrix of Economic Trajectories Relative Growth Rates (TCRPO) and Labor Productivity (TCRP)

TCRP TCRPO	TCRP>1T	CRP<1
TCRPO>1	4 Expansion	2 Progressive Transformation
TCRPO<1	3 Radical Transformatio	1 Regression

Source: Adapted from Morales, 2009: 30.

The modification made to the matrix proposed by Morales allows the assumption that the higher the trajectory number, the pattern will indicate the expansion of the economic sector. It will also be

possible to graph and project an image of the selected industry and services. Subsequently, a sum of the trajectories will be performed and categorized to mention which sectors lost dynamism, which gained dynamism, and which remained relatively stable.

3.Results

The results obtained for the municipality of Guadalajara are as follows: in the food industry, which includes the sectors 3112 Grain and seed milling and production of oils and fats, 3113 Production of sugars, chocolates, sweets, and similar products, 3115 Production of dairy products, and 3119 Other food industries. Sectors 3112 and 3119 are the ones with the greatest dynamism; the other two sectors are in transition.

As part of the textile and clothing industry, which corresponds to the sectors 3141 Manufacturing of carpets, linens, and similar items, 3149 Manufacturing of other textile products except garments, 3151 Manufacturing of knitted garments, 3152 Manufacturing of garments, and 3159 Manufacturing of clothing accessories and other unclassified garments. In this group, sectors 3141, 3152, 3149, and to a lesser extent 3159 are the ones losing dynamism and approaching regression. On the contrary, sector 3151 is gaining dynamism and trending toward expansion.

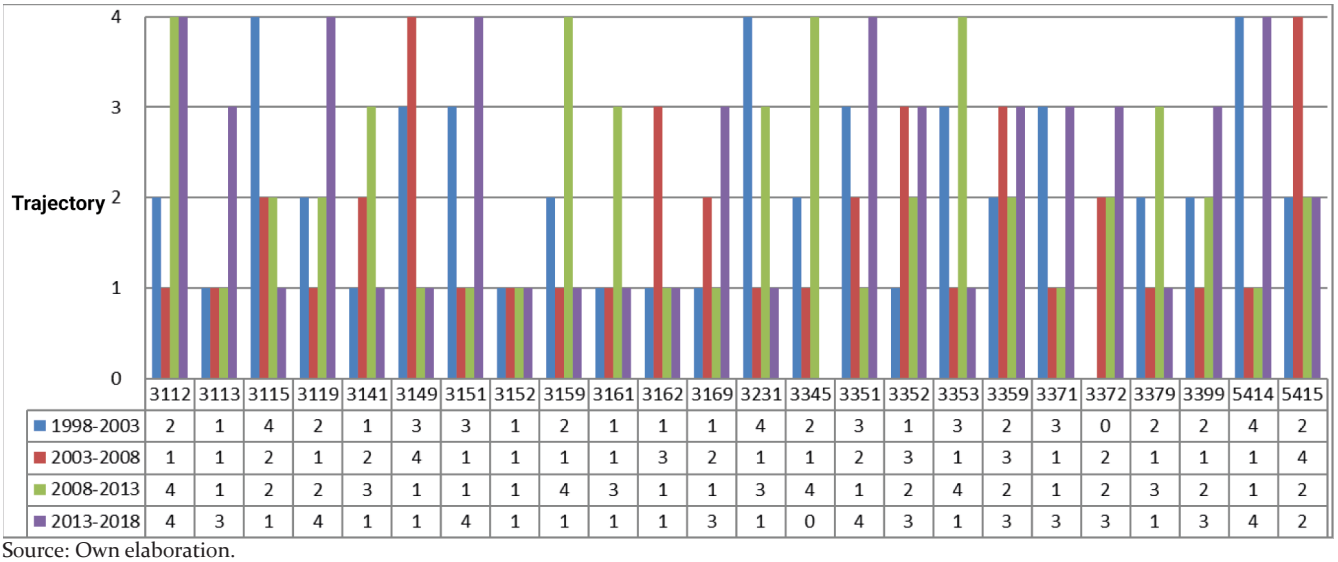
Considering the leather, hide, and substitute materials industry, which includes the sectors 3161 Tanning and finishing of leather and hide, 3162 Footwear manufacturing, and 3169 Manufacturing of other leather, hide, and substitute material products, it can be observed that sectors 3161 and 3162 show a trend toward regression, while sector 3169 shows low dynamism but a tendency toward radical transformation.

In the case of the electronics industry, the included sectors are 3345 Manufacturing of measuring, control, navigation, and electronic medical equipment, 3351 Manufacturing of lighting accessories, 3352 Manufacturing of household electrical appliances, 3353 Manufacturing of power generation and distribution equipment, and 3359 Manufacturing of other electrical equipment and accessories. Within this category, sectors 3345, 3351, 3352, and 3359 are trending toward expansion or radical transformation.

With respect to the furniture industry, which includes the sectors 3371 Manufacturing of furniture, except office and shelving furniture, 3372 Manufacturing of office furniture and shelving, and 3379 Manufacturing of mattresses, blinds, and curtain rods, it is identified that sectors 3371 and 3372 show a trend toward radical transformation, and only one sector (3379) shows a tendency toward regression.

Lastly, the branches belonging to the jewelry, specialized design, and software industries 3399 Other manufacturing industries, 5414 Specialized design, and 5415 Computer systems design and related services all show a tendency toward radical transformation, expansion, or progressive transformation, respectively.

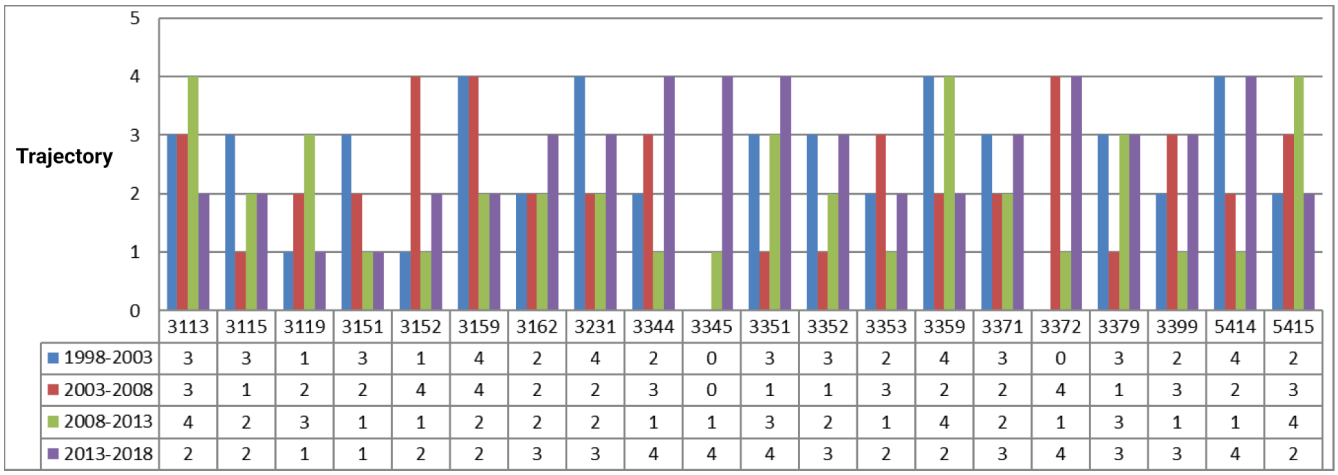
Graph 1. Distribution of branches by trajectories for the municipality of Guadalajara, from 1998 to 2018.



	3112	3113	3115	3119	3141	3149	3151	3152	3159	3161	3162	3169	3231	3345	3351	3352	3353	3359	3371	3372	3379	3399	5414	5415
1998-2003	2	1	4	2	1	3	3	1	2	1	1	1	4	2	3	1	3	2	3	0	2	2	4	2
2003-2008	1	1	2	1	2	4	1	1	1	1	3	2	1	1	2	3	1	3	1	2	1	1	1	4
2008-2013	4	1	2	2	3	1	1	1	4	3	1	1	3	4	1	2	4	2	1	2	3	2	1	2
2013-2018	4	3	1	4	1	1	4	1	1	1	1	3	1	0	4	3	1	3	3	3	1	3	4	2

Source: Own elaboration.

Graph 2. Distribution of branches by trajectories for the municipality of Zapopan, from 1998 to 2018.



	3113	3115	3119	3151	3152	3159	3162	3231	3344	3345	3351	3352	3353	3359	3371	3372	3379	3399	5414	5415
1998-2003	3	3	1	3	1	4	2	4	2	0	3	3	2	4	3	0	3	2	4	2
2003-2008	3	1	2	2	4	4	2	2	3	0	1	1	3	2	2	4	1	3	2	3
2008-2013	4	2	3	1	1	2	2	2	1	1	3	2	1	4	2	1	3	1	1	4
2013-2018	2	2	1	1	2	2	3	3	4	4	4	3	2	2	3	4	3	3	4	2

Source: Own elaboration.

In summary, in the municipality of Guadalajara, there are six branches that tend toward regression, twelve that show a tendency toward radical transformation or expansion, and six that oscillate between the two previously mentioned trajectories.

The municipality of Zapopan has leaned toward expansion, which is evident in the economic branches presented in Graph 2. It is important to note that for several branches, data is not available at this level of detail, as INEGI groups them under confidentiality principles, making a full analysis impossible. Therefore, those branches are not included in this document.

In Graph 2, it can be observed that the bars are small (between trajectories 1 and 3), showing a very particular structure that differs from the pattern projected by the municipality of Guadalajara. This is also observable in Graph 2, where branches 3119 and 3151 show a tendency toward regression, while all other branches tend toward progressive evolution, radical transformation, or expansion.

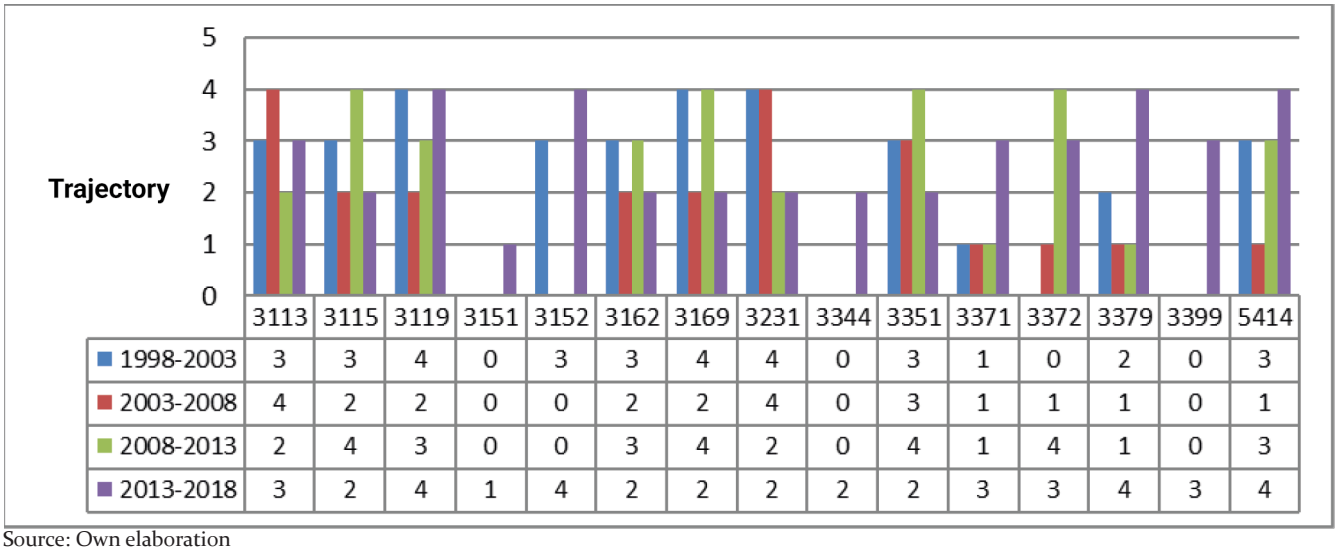
In summary, 15 out of 20 branches tend toward radical transformation or expansion, two branches show a tendency toward regression, and three branches oscillate between the two previous categories. It is important to mention that the services included in the analysis show a strong tendency toward expansion or transformation, which suggests that they are experiencing higher growth in the employed population relative to the growth of the employed population at the state level.

It is also possible to see that, unlike in the municipality of Guadalajara, the footwear and clothing industries in Zapopan are showing positive results from their restructuring, as some branches fall into trajectories 2 or 3, and some even exhibit an expansion trajectory in the latest period. Likewise, the electronics industry continues to follow an expansion path. Finally, specialized design and computing services tend toward restructuring through radical transformation or expansion. It is important to note that these sectors have shown significant dynamism, especially in Zapopan.

Continuing with the presentation of results, Tlaquepaque is one of the first municipalities that joined the Guadalajara Metropolitan Area (ZMG). Although it does not hold the same economic weight as the two previously mentioned municipalities, it presents an interesting dynamic. To describe this, we can refer to its behavior in Graph 3, in which it can be observed that, in its last period, most branches do not fall into trajectory 1, regression. Therefore, the overall pattern shows that the upper part of the graph remains in trajectories other than regression, and only in the furniture industry do several branches reach the regression trajectory though in their most recent trajectory, they recover. It is also noticeable that several branches, such as 3151, 3344, and 3399, only presented values in 2013 and 2018; therefore, they do not have a trajectory before this period.

The municipality of Tonalá is the fourth and final municipality that originally formed part of the ZMG. Although this municipality does not have as much economic activity as the others, it plays an important role in the dynamics of the area. Even though it does not provide information for all branches, it shows

Graph 3. Distribution of branches by trajectories for the municipality of Tlaquepaque, from 1998 to 2018.



	3113	3115	3119	3151	3152	3162	3169	3231	3344	3351	3371	3372	3379	3399	5414
1998-2003	3	3	4	0	3	3	4	4	0	3	1	0	2	0	3
2003-2008	4	2	2	0	0	2	2	4	0	3	1	1	1	0	1
2008-2013	2	4	3	0	0	3	4	2	0	4	1	4	1	0	3
2013-2018	3	2	4	1	4	2	2	2	2	2	3	3	4	3	4

Source: Own elaboration

dynamism in others. For example, in Graph 4, it can be seen that branches 3162, 3231, and 3371 show a pattern of regression, but recover in the last period.

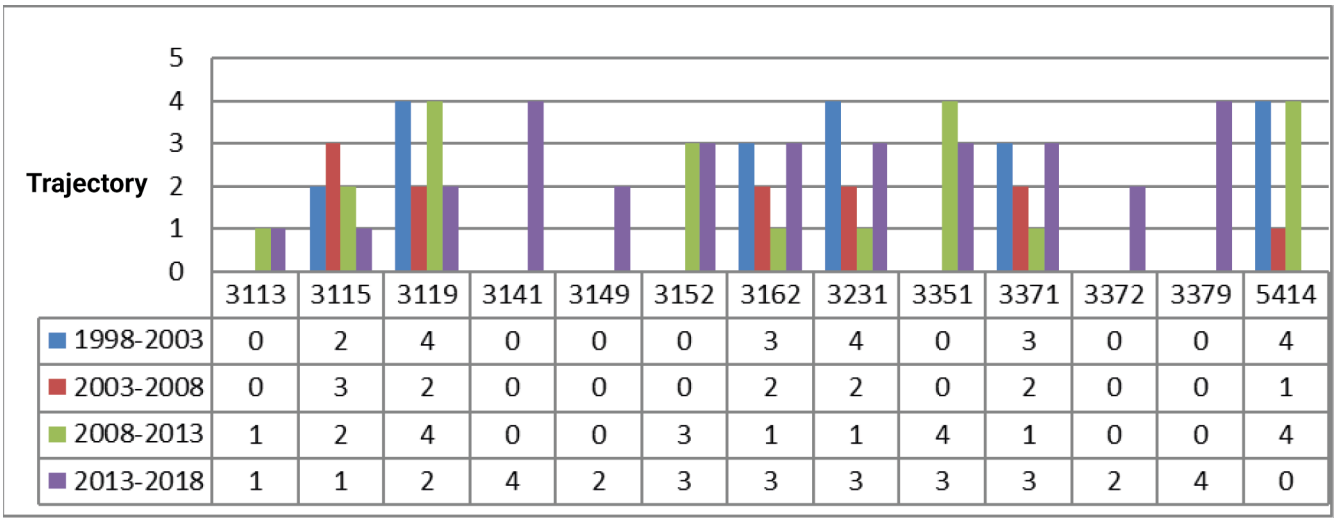
Additionally, the previous graph shows a growing presence of design-related activities, as well as activity in the textile, apparel, and furniture industries, along with services. However, the evolution in the services sector is not very clear, as data appears in one five-year period and disappears in the next, for example, in computer systems design services. It can be observed that only one branch, 3115, tends toward regression, while the rest of the branches could be said to show a positive dynamic of economic restructuring.

For the municipalities that were added to the ZMG later, Tlajomulco and El Salto, there are inconsistencies in the data. For instance, it is known beforehand that the municipality of El Salto is dedicated to the electrical industry, but the data is only available for the 2009 census. In the other censuses, the data does not appear. Therefore, only those branches with continuous data across the censuses were considered, and with them, it was possible to estimate the growth rate.

Branches marked with * are from the municipality of Tlajomulco; the rest are from the municipality of El Salto.

In Graph 9, it can be observed that for Tlajomulco, most of the bars do not reach trajectory 1, but the initial branches show significant height. It is also noticeable that some branches are new, such as 3159, 3341, and a reemergence of 3371. As for the

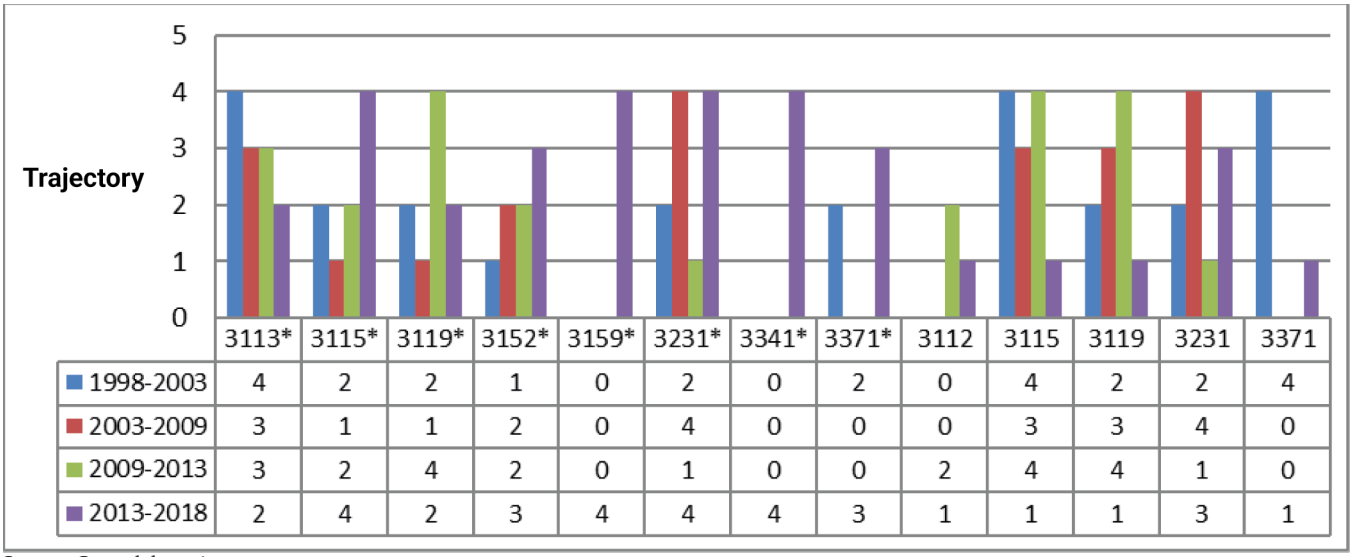
Graph 4. Distribution of branches by trajectories for the municipality of Tonalá, from 1998 to 2018.



	3113	3115	3119	3141	3149	3152	3162	3231	3351	3371	3372	3379	5414
1998-2003	0	2	4	0	0	0	3	4	0	3	0	0	4
2003-2008	0	3	2	0	0	0	2	2	0	2	0	0	1
2008-2013	1	2	4	0	0	3	1	1	4	1	0	0	4
2013-2018	1	1	2	4	2	3	3	3	3	3	2	4	0

Source: Own elaboration

Graph 5. Distribution of branches by trajectories for the municipality of Tlajomulco, from 1998 to 2018.



	3113*	3115*	3119*	3152*	3159*	3231*	3341*	3371*	3112	3115	3119	3231	3371
1998-2003	4	2	2	1	0	2	0	2	0	4	2	2	4
2003-2009	3	1	1	2	0	4	0	0	0	3	3	4	0
2009-2013	3	2	4	2	0	1	0	0	2	4	4	1	0
2013-2018	2	4	2	3	4	4	4	3	1	1	1	3	1

Source: Own elaboration

municipality of El Salto, the first branch appears to be relatively new, as data only starts to appear in 2008. Therefore, its first trajectory could only be calculated for the 2008–2013 period.

From the previous graph, it can also be seen that branch 3152, related to the manufacture of apparel in Tlajomulco, did not show strong dynamics; however, it does not exceed the threshold. Moreover, its last trajectory shows a radically changed pattern.

4. Economic Policy Review

This section presents a brief overview of recent developments in the various industries mentioned earlier, starting with the food industry, which has always been classified as a strategic sector—not only due to its added value, but also because it helps reduce dependence on foreign food supplies. This is reflected in increased production, as the average annual growth rate in the sector from 2010 to 2018 was 4% (INEGI, 2018). Likewise, in 2020, foreign direct investment rose from $79.69 million to $91.80 million, and exports also increased—from $191,211 thousand in 2019 to $230,902 thousand in 2020 (IIEG, 2020). These figures were reflected in the expansion trajectories for the municipality of Guadalajara.

In the case of the fashion industry (apparel, footwear, and jewelry), there have been some ups and downs, as previously discussed. However, in recent years, the industry has received strong support from the state government through programs by the Secretariat of Economic Promotion (SEPROE), in collaboration with business chambers such as the Regional Chamber of the Jewelry and Silverware Industry of the State of Jalisco (CRIJPEJ), the Jalisco Footwear Industry Chamber (CICEJ), and the Garment Industry Chamber. All of these entities work in coordination with an advanced design center called MIND (México Innovación y Diseño), a project driven by the Council of Industrial Chambers of Jalisco (CCIJ) and the Confederation of Industrial Chambers (CONCAMIN), with the goal of fostering innovation and competitiveness in Mexico.

Additionally, initiatives such as the Fashion Council of the State of Jalisco have been created to position Guadalajara as the fashion capital of Latin America (Serrano y Amparo, 2019). Some of the advances resulting from this include jewelry exports to the U.S., followed by Canada, the UK, Dubai, and 29 other countries (Serrano y amparo, 2019). Meanwhile, the footwear industry exports only 5% of its total production, indicating low dependency on foreign markets (Mares y Martínez, 2013).

It's important to mention that since China joined the World Trade Organization (WTO) in 2002 and signed a trade agreement with Mexico in 2011, exports in the textile and garment industry have declined by more than half (Sánchez, Vázquez & Richardt, 2012). Only in 2018 did the sector start recovering, growing further in 2019 to a value slightly over $42 million. Despite all these efforts, there has been no positive impact on the industry in Guadalajara, where regression trajectories were observed.

As for the furniture industry, between 2009 and 2014, only 18.79% of products were exported, while

81.29% were consumed domestically (Lozano y Trinidad, 2016), This suggests that the industry is primarily reliant on national consumption, and thus, international market fluctuations have limited impact. However, this did affect the growth rate, which fell from a consistent rate of over 30% in Jalisco to just 15.71% between 2009 and 2014 (INEGI, 2014). Despite competition from China, the market remains mostly domestic, although more efforts are needed to maintain or boost national consumption of locally produced goods.

Lozano and Trinidad (2016) state that under these conditions, furniture industry entrepreneurs have made efforts to implement collaborative strategies such as clusters to reduce production costs, increase production through design modeling, and gain bargaining power both in purchasing inputs and in selling products. However, the lack of cooperation and the individualistic nature of Jalisco's entrepreneurs hinder access to international markets.

The organizations involved in promoting competitiveness among furniture businesses include: AFAMJAL (Association of Furniture Manufacturers of Jalisco), and the National Chamber of Commerce, Services and Tourism of Tlaquepaque (CONACO Tlaquepaque).

In the electronics sector, exports increased by 5.3% between 2018 and 2019 (IIEG, 2020) and foreign direct investment grew by 10% over the same period. This industry accounts for 55% of total exports. For example, the company Continental chose to relocate from Detroit to Jalisco in 1992 due to advantages like location, low costs, and high potential. It's noted that only the most advanced labs in the world have complete project development like the one Continental operates in Guadalajara. The company also works in partnership with Cinvestav and Tecnológico de Monterrey. Its export distribution is 60% to the U.S., 30% to Europe, and 10% to Asia.

INTEL operates in Guadalajara, where it designs hardware and software technologies. However, its most distinctive contributions, particularly in comparison to other Intel centers worldwide, relate to microprocessor development. Guadalajara notably contributed 20 engineers to the creation of an advanced microprocessor (Rivera, Chapman, Sánchez y Polanco, 2014).

In 2006, the Western branch of CANIETI set out the goal of transforming Jalisco into Mexico's software capital. This initiative emerged from a coordinated effort among CADELEC (founded in 1997 by leading companies such as IBM and Intel), the Government of the State of Jalisco, and CANIETI itself. Previously, in 2001, CANIETI had promoted the establishment of CIPIS, the Center for Research and Promotion of the Software Industry. However, this project was short-lived and eventually dissolved. Later, in 2002, the Jalisco Institute of Information Technologies (IJALTI) was founded with the goal of fostering the use, development, and strategic adoption of Information and Communication Technologies (ICT), as well as driving the sector's overall growth (Palacios 2008).

5. Discussion

Governmental support, particularly during the administration of Alberto Cárdenas (1995–2001), played a key role in promoting foreign direct investment in sectors such as electronics, machinery and equipment, the automotive industry, and auto parts manufacturing (González 2019). However, this shift came at the expense of other traditional industries in Guadalajara. For instance, the footwear industry declined from 692 manufacturing businesses in 1999 to 403 by 2018. Similarly, garment manufacturing dropped from 501 companies to 351, and carpet and household textile production decreased from 33 companies to just 24 over the same period (INEGI).

According to Bernal, Rodríguez and Ortiz (et al 2020) Guadalajara currently specializes in the food industry, textile manufacturing (excluding garments), leather tanning and finishing, electronics, and other manufacturing industries. These findings align with the present study. Interestingly, traditional industries are not receiving significant attention or benefits from policy interventions. Instead, industries that supply intermediate goods such as textiles and leather processing appear to demonstrate greater dynamism and competitiveness.

Similarly, the municipality of Zapopan shows specialization in textiles (excluding garments), wood and paper industries, and computing technologies (Bernal et al, 2020). However, the present study indicates a more nuanced picture: traditional industries such as footwear and garments have shown positive performance trends in Zapopan.

The food industry is also experiencing renewed momentum, along with other sectors such as clothing and footwear in Zapopan, and leather goods in Guadalajara. This trend can be attributed to the growth of design-focused initiatives and new product development. Such developments are being facilitated by the establishment of new design centers and productivity-enhancing programs. Notably, the fashion industry, the software design sector in both Guadalajara and Zapopan, and the emergence of innovation ecosystems like MIND have contributed to the revitalization of once-declining sectors.

6. Conclusions

The shift from import substitution policies to neoliberal economic reforms in Mexico has encouraged investment in high value-added activities while leaving traditional industries behind. This study sought to answer: Which industries have lost competitiveness in this changing environment? The findings reveal that garment and textile manufacturing, along with leather tanning and footwear production, are among the industries most in need of restructuring. These sectors have been in decline for over two decades in Guadalajara. However, in Zapopan, these same industries have managed to remain viable, with some following radical or progressive transformation trajectories.

The second research question was: Which industries are currently undergoing economic restructuring? These include sectors on transformation trajectories 2 and 3, such as the manufacturing of leather goods and furniture, which are actively working to maintain their market positions. Meanwhile, growth is evident in industries such as specialized design, which shows positive development in Guadalajara, Zapopan, and Tlaquepaque. Software design has received strong institutional support in Guadalajara and Zapopan.

Notably, industries do not grow consistently within a single municipality. Instead, they tend to relocate to more dynamic or favorable environments. Examples include the electrical industry, software design, specialized design, and leather goods production, all of which originated in one area but later shifted to others. Technological diffusion has also driven labor displacement through innovations such as remote work and digital platforms. While these changes may not yet be reflected in quantitative data, industries with greater adaptability, especially those focused on design rather than manufacturing, are better positioned for the future.

Future agendas must prioritize the integration of new technologies. Achieving dynamism in today's economy requires embracing cloud computing, e-commerce platforms, and digital design tools. For instance, Nike now offers customers the ability to design personalized sneakers using digital platforms, something currently out of reach for many small businesses that have yet to innovate or lack the resources to do so.

Subsequent studies should explore strategies for technology adoption, production process reconfiguration, new product development, and commercial innovation. These efforts must be supported by public policies aimed at aiding the restructuring of declining industries.

References

Alonso, J. y Carrillo, J. (1996). Gobernación económica y cambio industrial en la frontera norte de México: un análisis de trayectorias locales de aprendizaje. Revista EURE - Revista De Estudios Urbano Regionales, 22(67). https://repositorio.uc.cl/xmlui/bitstream/handle/11534/3621/000157850.pdf

Azariadis, P., Papagiannis, P., & Koutkalaki, Z. (2018). Integrating modern virtual engineering tools in footwear design and development. IOP Conference Series: Materials Science and Engineering. https://doi.org/10.1088/1757-899X/459/1/012072

Bernal, M, Rodríguez, J y Ortiz F, E (2020): Distribución y especialización manufacturera en los municipios de la zona metropolitana de Guadalajara, periodo 2004-2014.

Cuadrado-Roura J y Maroto-Sánchez A (2012) Análisis del proceso de especialización regional en servicios en España. EURE. Vol 38. No. 114. P 534. https://www.eure.cl/index.php/eure/article/view/156/554

Friedman, E., & Kuruvilla, S. (2015). Experimentation and decentralization in China's labor relations. Human Relations, 68(2), 181–195. https://journals.sagepub.com/doi/full/10.1177/0018726714552087

FitzGerald, V. (2003) La CEPAL y la teoría de la industrialización. St. Anton´s College. Oxford.

González Rodríguez, S. (2019). CAMBIOS EN LA ESPECIALIZACIÓN ECONÓMICA DE LAS CIUDADES DEL OCCIDENTE DE MÉXICO, 1960 - 1990. Carta Económica Regional, (58), 3 - 10. https://doi.org/10.32870/cer.voi58.7662;

Hsueh, R. (2015). Nations or sectors in the age of globalization: China's policy toward foreign direct

investment in telecommunications. Review of Policy Research, 32(6), 627–648. https://onlinelibrary.wiley.com/doi/10.1111/ropr.12149

Hong Y (2017) Pivot to Internet Plus: Molding China's Digital Economy for Economic Restructuring?. International Journal of Communication. 1932–8036/20170005. https://ijoc.org/index.php/ijoc/article/view/6105

Isaksen A, Jakobsen S, Njos R y Normann R (2018) Regional industrial restructuring resulting from individual and system agency. Innovation: The European Journal of Social Science Research Volume 32, 2019 - Issue 1: New insights on regional innovation policies. https://www.tandfonline.com/doi/abs/10.1080/13511610.2018.1496322

Instituto Nacional de Estadística y Geografía (INEGI) Censos Económicos, 1999, 2004, 2009, 2014 y 2019. https://www.inegi.org.mx/

El Instituto de Información Estadística y Geográfica del Estado de Jalisco (IIEG), valor de las exportaciones al 2020. https://iieg.gob.mx/ns/

Mares y Martínez, (2013) Las tecnologías de información en las pyme´s de la industria del calzado. XVII CONGRESO INTERNACIONAL EN CIENCIAS ADMINISTRATIVAS – 2013. Universidad del valle de Atemajac.

Lozano K. y Trinidad J (2016) Estrategias locales para recuperar la competitividad en el mercado internacional: el caso del sector mueblero de Jalisco, México a partir del 2008. En panorama de la investigación en las ciencias económico administrativas. International Council for Small Business México, A.C.. ISBN: 978-607-97383-0-3

Morales F (2009) Trayectorias y patrones de evolución económica en los municipios de Chiapas, 1988-2003. Universidad Nacional Autónoma de México.

OECD, & Eurostat. (2018). Oslo Manual 2018. In Handbook of Innovation Indicators and Measurement

OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris, http://oe.cd/frascat

Palacios J. (2008) Alianzas público-privadas y escalamiento industrial. El caso de complejo de alta tecnología de Jalisco, México. Estudios y perspectiva. Series. CEPAL. https://www.cepal.org/es/publicaciones/5026-alianzas-publico-privadas-escalamiento-industrial-caso-complejo-alta-tecnologia.

Rendón, Rosales y Mejía (2019) Shift-share espacial del empleo manufacturero municipal. Zonas Metropolitanas: Valle de México y Toluca, 2008-2013. Economía, Sociedad y Territorio, vol. xviii, núm. 59, 1213-1242. DOI: http://dx.doi.org/10.22136/est20191248

Rodríguez J (2006) La nueva economía y sus efectos en la ciudad de Guadalajara: La última década del siglo XX. Guadalajara, México: Universidad de Guadalajara.

Sanchez J, Vazquez M y Richardt, L (2012) Estrategias competitivas en la industria textil en Jalisco, ante la liberación comercial con China. Red Internacional de Investigadores en Competitividad. Memoria del VI Congreso ISBN 978-607-96203-0-1. https://www.riico.net/index.php/riico/article/view/413

Serrano D y Amparo D (2019): Redes productivas de la industria de la joyería de México: el caso de Guadalajara. In: Abordajes teóricos, impactos externos, políticas públicas y dinámica económica en el desarrollo regional. Universidad Nacional Autónoma de México y Asociación Mexicana de Ciencias para el Desarrollo Regional A.C, Coeditores, Ciudad de México. ISBN

Solís, L (2000) La realidad económica mexicana: retrovisión y perspectivas. México: FCE.

UNAM Volumen I: 978-607-30-2640-6 ISBN UNAM Obra completa: 978-607-30-2621-5 ISBN AMECIDER Volumen I: 978-607-8632-07-7 ISBN AMECIDER Obra completa: 978-607-8632-06-0. http://ru.iiec.unam.mx/4682/

Vázquez, A. (2011). "Los territorios innovadores, espacios estratégicos del desarrollo". En J.L. Curbelo, M.D. Parrilli, y F. Alburquerque (eds.), Territorios innovadores y competitivos. Publicaciones Orkestra, San Sebastián.

Vázquez A (2015) Cambio de Modelo de Desarrollo en los Territorios Innovadores: La Complejidad del Proceso. Revista Mexicana sobre desarrollo local. ISSN: 2395-863.

Vázquez-Barquero, A and Rodríguez-Cohard JC. (2019) Local development in a global world: Challenges and opportunities. Reg Sci Policy Pract. https://doi.org/10.1111/rsp3.12164

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Exploratory Analysis of Health Tourism in Hermosillo, Sonora, and its Integration into the Digital Economy

Análisis exploratorio del turismo de salud en Hermosillo, Sonora y su incorporación en la economía digital

Date received: February 15, 2024 Date of approval: May 21, 2024

Andree Maximiliano Berrelleza Rocha[1], Myriam Lissette Carrillo Ramírez[2], Rosaura Barboza Guerrero[3]

[1] Technical Professional Bachelor's in Informatics, final-semester student of the Bachelor's Degree in Business and International Trade at Universidad de Sonora.
Email: a22020209l4@unison.mx ORCID: https://orcid.org/0009-0004-8440-9635

[2] Bachelor's Degree in Economics with a specialization in Sustainable Development and a Master's Degree in Policies and Social Development Management. Currently a faculty member at Universidad de Sonora, and Universidad Kino.
Email: myriam.carrillo@unison.mx ORCID: https://orcid.org/0009-0009-8137-2757

[3] Bachelor's Degree in International Trade, Master's Degree in Foreign Trade and Customs. Currently a faculty member at Universidad de Sonora.
Email: rosaura.barboza@unison.mx ORCID: https://orcid.org/0009-0000-5346-3584

Abstract

By the year 2019, the growth of the private medical industry was more prominent in the border cities of the state of Sonora due to the influx of foreign patients and approximately six hundred thousand Sonorans or their descendants residing in the state of Arizona (López, 2019). Among the border municipalities, Hermosillo stands out due to its internationally certified private hospital infrastructure. However, the lack of postoperative services, the absence of external agents promoting these services both abroad and within Mexico, and a disconnect in the value chain have hindered the growth of the medical industry in the capital (López, 2019). The concept of the digital economy does not yet have a widely accepted definition, as society is still in the early stages of digitalization. There is a gap between the available tools and their implementation to optimize the value chain and enhance customer experience. This document contextualizes Hermosillo, Sonora's private medical services industry within the digital economy through a documentary investigation of digital resources, analyzing political, economic, social, and technological aspects. Furthermore, the health crisis forced the digitalization of commercial processes to achieve established objectives, positioning the medical industry as a key player in the digital economy.

Keywords: Digital Economy, Digitalization, Medical Industry, Health Tourism.

JEL Codes: I-11

Resumen

Para el año dos mil diecinueve el crecimiento de la industria médica privada se daba más en las ciudades fronterizas del estado de sonora debido a la afluencia de pacientes extranjeros y unos seiscientos mil sonorenses o descendientes radicados en el estado de Arizona (López, 2019). Hermosillo destaca de los municipios fronterizos, gracias a la infraestructura privada hospitalaria certificada internacionalmente. Sin embargo, la ausencia de servicio postoperatorio al igual que agentes externos promotores de los servicios en el extranjero como en la república mexicana y una desconexión en la cadena de valor, han frenado el crecimiento de la industria médica en la capital (López, 2019). El concepto de economía digital no cuenta con una definición ampliamente aceptada, debido a que la sociedad se encuentra

en las primeras etapas de digitalización. Existe una brecha entre las herramientas y su instrumentación para eficientar la cadena de valor y la experiencia del cliente. El presente documento contextualiza la industria privada de servicios médicos de Hermosillo, Sonora en la economía digital mediante una investigación documental de recursos digitales, esto en materia política, económica, social y tecnológica. Aunado a lo anterior la crisis sanitaria forzó a la digitalización de los procesos comerciales para lograr los objetivos planteados, por lo que la industria médica se convirtió en un actor de la economía digital.

Palabras clave: Economía digital, Digitalización, Industria médica, Turismo de salud.

Códigos JEL: I-11

1. Introduction

The definitions of health tourism vary depending on the author consulted. According to the present research, it refers to the movement of a patient seeking treatment due to a lack of option in their home country, excessively long waiting periods, or high service costs. However, this study focuses on the definition provided by the World Tourism Organization (UNWTO) in collaboration with the European Travel Commission (ETC). This report proposes a coherent conceptualization that describes the intricate system of the industry. The recommended taxonomy and definition indicate that, in general terms, tourism is defined as:*" Tourism and travel are activities that can contribute to the creation or enhancement of well-being"* (OMT Y CET, 2018, p.9). Specifically, health tourism is defined as:

It encompasses those types of tourism whose primary motivation is to contribute physical, mental, and/or spiritual health through medical and wellness activities that enhance individuals' ability to meet their own needs and function better in their environment and society (OMT Y CET,2018, p.9).

The following table summarizes the types of tourism mentioned in the previous definition.

Table 1. The Three Segments of Health Tourism

Indicators	Types of Tourism		
	Retirement Tourism	Wellness Tourism	Medical Tourism
Consumption Factors	Retirees travel abroad to maintain or improve their standard of living from their productive years.	The desire to maintain or enhance overall well-being.	The pursuit of well-being through conventional medicine, treatment, or surgical intervention.
Providers	Depend on the retirement segment they serve and may include professionals with various certifications or none.	Individuals with different certifications and levels of qualification.	Healthcare professionals such as doctors, nurses, and specialists.
Types of Services	Vary based on the target market segment. Example: retirement homes, independent living.	Alternative medicine, yoga, or spas, among others.	Invasive procedures, treatments, or diagnostics.

Source: Market Opportunities and Prospects for Health Tourism in Mexico

Understanding the concept of "Health Tourism" as an activity that involves traveling outside one's place of origin with the sole objective of improving health and well-being, it is also essential to identify the factors that have shaped this industry in recent years and contributed to its constant growth.

Table 2. Factors Driving the Growth of the Health Tourism Industry

The increasing elderly population leads to higher demand for long-term specialized healthcare and caregiving services.
According to UN data, more than half of the world's population currently lives in urban areas, and this figure is expected to rise to two-thirds by 2050. Life in large cities can influence people to seek options that counteract chronic diseases associated with urban lifestyles.
The rise in available time and financial resources allocated to leisure activities—such as travel, entertainment, and healthcare—has fueled the demand for wellness-oriented travel and a healthier lifestyle.

Source: Exploration of Health Tourism – Executive Summary.

Health tourism emerges as an option that contributes to the development of countries and regions, significantly impacting finances through its multiplier effect. According to El Financiero (2023), this sector influences medical services and complementary industries such as logistics, gastronomy, hospitality, and tour

operators. In 2019, global healthcare expenditures represented 10% of the world's gross domestic product (World Health Organization, 2019). Furthermore, according to Mordor Intelligence (2024), the global medical tourism market is estimated at $84.92 billion in 2024 and is expected to reach $239.37 billion by 2029, growing at a compound annual growth rate (CAGR) of 23.03% during the forecast period (2024-2029). Currently, according to the World Trade Organization (WTO), Mexico has established itself as one of the global leaders in medical tourism, alongside countries such as Thailand, Costa Rica, India, Malaysia, Singapore, and South Korea (El Financiero, 2023). Additionally, Mexico has developed an extensive network of trade agreements, including fourteen free trade agreements, thirty reciprocal investment promotion and protection agreements with thirty-one countries or administrative regions, and nine limited-scope agreements under the framework of the Latin American Integration Association (ALADI) (Government of Mexico, 2023). One example is the Sonora-Arizona Commission, established in 1959 (Rubio, 2023). This collaboration has led to the implementation of strategies to leverage comparative and competitive advantages, facilitating the development of cross-border projects and trade corridors. These efforts promote the integration of both states in commercial, social, and cultural aspects (Government of the State of Sonora, 2024). In recent years, Mexico has ranked as the second-largest destination for health tourism worldwide, receiving 1.2 million visitors annually. The country welcomes patients from various nations, primarily seeking services related to cardiothoracic surgery, plastic surgery, ophthalmology, oncology, dentistry, gastroenterology, reproductive medicine, orthopedics, and gynecology, among others (Hernández, A. 2023). Sonora possesses several advantages that favor the development of medical tourism, including hospital capacity, healthcare professionals, and the *Law for the Promotion of Tourism of the State of Sonora and its Regulations*, which support the search for more and better services. Additionally, its proximity to the United States, the world's largest healthcare market, creates a favorable environment for U.S. residents to seek healthcare services in Sonora. The lower cost of medical services compared to other countries, along with well-developed transportation infrastructure, allows for continuous patient flow. Furthermore, Sonora boasts significant hotel and resort capacity, with more than 17,000 rooms and an extensive service network. The state also has specialized tourism service companies, as well as natural attractions and recreational activities that may be of interest to visitors and their companions (Datatur, 2020). In the specific case of Hermosillo, the city's characteristics make it an attractive destination for medical services. By 2020, Hermosillo had 48 healthcare centers and 2,544 healthcare spaces. The city's leading private clinics and hospitals include *Hospital San José, Centro Médico del Noroeste, CIMA, Licona, Sanatorio San Francisco, and Clínica San Benito* (Ministry of Health, 2020). For these reasons, it is essential to consider health tourism as a viable option for business development and meeting the healthcare needs of patients worldwide. A key factor in increasing the competitiveness of Sonora's private medical services in health tourism is its integration into the digital economy. Every revolution transforms industries, and Industry 4.0 is inherently reshaping the global medical tourism landscape. The emphasis on connectivity and automation opens the door to endless possibilities in a rapidly growing sector. For healthcare professionals, this transformation expands their reach and access to new markets while facilitating global collaboration with colleagues. Patients benefit from greater convenience, control, and transparency in finding healthcare services. Businesses can create new business models, optimize processes, and increase profitability. These are just a few of the benefits for all stakeholders involved in the industry.

2. Methodology

This study is based on an exploratory documentary investigation of health tourism at the national, state, and local levels. It involves a content analysis of digital sources such as industry reports, research papers, scientific articles, opinion pieces, and journalistic reports. Additionally, databases and statistical resources from Mexico, the World Bank, and the World Health Organization were considered.

2.1. Problem Statement

The Mexican medical tourism industry has positioned itself as one of the global leaders in the sector, according to the World Trade Organization (*El Financiero,* 2023). However, despite its potential, it faces challenges that hinder its full development. Industry experts emphasize the need to implement strategies to attract more patients, improve

workforce training, and establish an appropriate legal framework. Misael Uribe, Director of International Medicine at *Hospital Médica Sur*, highlights the lack of available information and stresses the importance of leveraging Mexico's existing infrastructure, certifications, favorable location, and competitive pricing in the medical tourism sector (Luna, 2023).

Similarly, Jorge Azpiri, Director of Development and Expansion at *TecSalud*, expresses concern that despite Mexico's exceptional geographic location and significantly lower costs compared to the United States, the country has yet to fully capitalize on its potential in this industry (Luna, 2023). Javier Potes, Director of the *Mexican Hospital Consortium*, points out the absence of a unified strategy in developing medical tourism in Mexico, emphasizing the need for more effective coordination to attract a greater number of international patients (Luna, 2023).

According to Ayala Espinosa (2023), the growth of medical tourism in different states not only helps attract more visitors but also creates opportunities for the development of medical manufacturing and pharmaceutical e-commerce in various regions. Experts suggest that integrating the industry into the digital economy will be a key element in future strategies to boost the growth of medical tourism in Hermosillo, Sonora.

2.2. Objective

To identify the viability of the digital economy as a tool for the development of the private medical industry in Hermosillo, Sonora, within the scope of medical tourism. This study aims to recognize the opportunities presented by the integration of digital technologies in this sector.

3. Literature Review

3.1. Medical Tourism in Mexico

It is estimated that health tourism began in the late 20th century (Connell, 2013). This industry is characterized by its regional and cross-border development, demonstrating significant global potential. The economic value derived from health tourism-related activities has increased over the years: in 2016, its value stood at $4.792 billion, rising to $5.064 billion in 2017, and exceeding $5.3 billion in 2018. The industry's growth rate between 2013 and 2018 was estimated at 33.7%, with an expected annual trend growth rate of approximately 13.5% for the 2024-2030 period (Secretaría de Turismo, 2022). It is estimated that the revenue generated per medical tourist in Mexico ranges between $5,000 and $20,000, depending on the treatment. Regarding accommodation, medical tourists are expected to stay in the country for approximately five to fifteen days (Deloitte, 2019). By 2021, the healthcare sector in Mexico reported an economic contribution equivalent to 6.2% of the national Gross Domestic Product (GDP) (Instituto Nacional de Estadística y Geografía, 2022). During the first half of 2022, Mexico issued 201,495 medical passes to foreign nationals, generating an estimated economic inflow of approximately 80 million pesos (Secretaría de Turismo, 2022). According to Hernández Castillo (2023), health tourism in Mexico has thrived due to three key factors: certified medical professionals, modern healthcare infrastructure, and competitive pricing. Patients can save between 36% and 89% on treatments and outpatient procedures compared to costs in the United States, France, Germany, Canada, and Italy. The ratio of specialist doctors to general practitioners is 63.4%, surpassing the average of 57.7% among member countries of the Organization for Economic Co-operation and Development (OECD) (Hospital CMQ, 2023). This competitive advantage strengthens Mexico's position in the healthcare sector, offering a broad range of high-quality specialized medical services. Additionally, the country's geographic proximity to one of the world's largest markets, the United States, has been a key factor in the success of health tourism (Banco Nacional de Comercio Exterior, 2022). American travelers account for 70% of revenue in the Mexican healthcare sector. Studies indicate that demand for medical services in the United States is expected to increase, particularly among the "baby boomer" generation, which will require greater medical attention as they surpass the age of 70. Furthermore, according to the U.S. government, approximately 30 million Americans lack health insurance, representing 12.1% of the population. The United States is considered a significant market, as it has one of the most expensive healthcare systems globally (Centro de Investigación de Alimentación y Desarrollo, 2015). Regarding wellness tourism, the overall industry value stands at $17.9 billion, with an average annual growth rate of 16%. A wellness

tourist spends approximately 53% more than other types of tourists (Deloitte, 2019). In Mexico, this segment represents 2.6% of the tourism industry. Specific regions within the country have emerged as leading wellness tourism destinations, earning international recognition, such as Tulum, which has been designated the "Yoga Capital of the World" (La Pancarta, 2017). Other prominent wellness tourism destinations in Mexico include Baja California, Baja California Sur, Monterrey, Jalisco, Nayarit, Colima, Guerrero, Oaxaca, Chiapas, Tabasco, Yucatán, Quintana Roo, San Luis Potosí, and Guanajuato. The main activities associated with wellness tourism include traditional pre-Hispanic medicine, temazcales, healthy eating, spas, yoga, detox programs, beauty treatments, and anti-aging therapies (Deloitte, 2019). Additionally, retirement tourism presents significant potential in Mexico. Tourists within this segment allocate substantial financial resources, as they tend to stay in their destinations for an average of sixteen days. They also travel internationally approximately three times per year, with an average expenditure of around $3,000 per traveler and an annual household income of $123,676. It is estimated that by 2050, approximately four million retired Americans will seek to reside in Mexico. These tourists are drawn to the country due to its proximity to their home nations, attractive culture, healthcare services, and recreational opportunities (Deloitte, 2019).

3.2. Capacity of the Healthcare System in Mexico

Based on the analysis of projections regarding the demand for healthcare services, it is essential to assess Mexico's capacity to attend to patients. In this regard, as of 2018, Mexico had ninety-eight hospitals accredited by the federal Ministry of Health and seven certified by the Joint Commission International. Some of these hospitals are located in states such as Baja California, Baja California Sur, Mexico City, Chihuahua, Jalisco, Sonora, Nuevo León, Puebla, Quintana Roo, San Luis Potosí, Tamaulipas, and Yucatán (Banco Nacional de Comercio Exterior, 2022). By 2020, seven federal entities concentrated 53% of private healthcare establishments, of which 10.9% provided specialized care. Among 15,399 medical offices, 35.7% were designated for general and emergency medical consultations, while 64.3% were used for specialized consultations. Additionally, the country had 5,141 operating rooms, 1,041 clinical analysis laboratories, 458 mammography units, 424 computed tomography (CT) scanners, 95 radiotherapy units, and 1,148 intensive care units (ICUs) for adults (Instituto Nacional de Estadística y Geografía, 2022). Furthermore, in 2021, outpatient services in Mexico accounted for 71.9% of medical consultations, highlighting the importance of ambulatory care (diagnostics and treatments). General and family medicine services represented 22.4%, emphasizing the significance of primary healthcare. Hospitalization and support services accounted for 13.6%, while dentistry comprised 6.94%. Additionally, urology and pediatrics represented 3.47% and 2.84%, respectively, indicating the availability of specialized services in these areas. Lastly, surgical services accounted for 2.52% (Data México, 2022).

3.3. Medical Tourism in Sonora

According to Bancomext (2022), Sonora is among the Mexican states that receive the highest volume of health tourism, alongside Baja California, Baja California Sur, Mexico City, Chihuahua, Jalisco, Nuevo León, Puebla, Quintana Roo, San Luis Potosí, Tamaulipas, and Yucatán. In this context, Sonora serves a profile of foreign patients with limited healthcare coverage, positioning the state as a potential health tourism hub over the next ten years (Imparcial, 2023). The primary retirement communities in Sonora are in San Carlos, Puerto Peñasco, and Álamos. According to Deloitte (2019), these communities represent a significant opportunity for medical tourism in the state. Considering this, Sonora is developing strategies to attract more patients. Furthermore, according to the 2021-2022 government report of the State of Sonora, in 2021, the state government collaborated with the University of Arizona, Section 43 of the National Union of Health Sector Workers (SNTSSA), El Colegio de Sonora, and the University of Arizona's School of Public Health to offer the "Diplomado de la Salud" program. This initiative aimed to contribute to the training and professional development of health promoters working in various sectors and institutions. Additionally, Sonora participated in the "Meta Salud Diabetes" educational program. These efforts have enhanced Sonora's visibility as a healthcare destination, making it a focal point for international healthcare initiatives. Given the benefits stemming from the Sonora-Arizona relationship, the state's border cities have experienced significant growth in private

healthcare services, catering to approximately 600,000 Sonoran nationals, as well as American and Canadian patients. These international patients seek dental treatments and specialized medical services due to cost savings, quality, and infrastructure (Alvarado, M., 2018). In October 2023, the Sonora-United States Commission was relaunched, expanding collaboration to include California, New Mexico, and Texas. This initiative involved restructuring the original sixteen focus areas into seven key axes: Quality Education, Health and Well-being, Sustainable Energy, Water and Environmental Resilience, Economic Development and Global Promotion, Public Safety, Infrastructure and Logistics, and Tourism. Among these, health tourism is a priority for strengthening Hermosillo's position as a medical industry hub. Through this initiative, Sonora is reinforcing cross-border cooperation, positioning itself as a healthcare solution for the neighboring country while fostering an international partnership based on collaborative efforts and effective solutions (Gobierno del Estado de Sonora, 2023). Regarding the state's installed capacity to meet the growing demand for health tourism services, the National Statistical Directory of Economic Units (2024) reports that Sonora has approximately 4,266 healthcare facilities, including medical and dental offices, other healthcare consultation centers, and outpatient care centers for non-specialized patients. This information is detailed in Table 2.

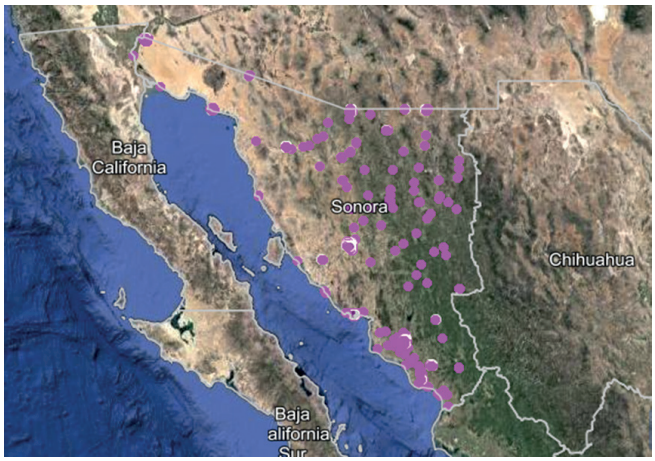
Table 2. Healthcare Facilities in Sonora

ACTIVITY	SONORA
Medical offices	2193
Dental offices	1242
Other health care offices	779
Outpatient care centers for patients who do not require hospitalization	52
Total	4266

Source: National Statistical Directory of Economic Units.

Figure 1 shows the location of these health care units across the state of Sonora, represented by points on the map. These units are mainly concentrated in the central, southern, and northern regions of the state, particularly along the border with the United States.

Figure 1. Distribution of health care units in Sonora.



Source: National Statistical Directory of Economic Units.

Most of these health centers and hospitals are distributed across the cities of Hermosillo, Nogales, Guaymas, Navojoa, and Ciudad Obregón (Cárdenas, P., 2020). Among them, approximately ten medical units meet relevant standards, including those granted by the General Health Council, the *Joint Commission International*, Accreditation Canada International, and the American Association for Accreditation of Ambulatory Surgery Facilities (Centro de Investigación de Alimentación y Desarrollo, 2015). Regarding healthcare personnel, the number of physicians per thousand inhabitants in Sonora has increased in recent years. By 2019, it was estimated that there were 2.9 physicians per thousand inhabitants, including general practitioners, specialists, interns, and residents from both public and private institutions. In comparison, the World Health Organization considers an acceptable rate to be 3 physicians per thousand inhabitants, meaning that Sonora is close to reaching this level. In terms of nurses, it was estimated that there were 3.4 nurses per thousand inhabitants (Pineda, N., n.d.). Currently, Mexico has a legal and regulatory framework for medical and health tourism. In 2022, the Senate approved a reform to promote this type of tourism in the country, fostering collaboration between the Ministry of Health and the Ministry of Tourism to establish quality standards in medical services. In addition, the creation of the National Registry of Destinations was approved, aiming to classify tourist zones according to their development level, with the objective of designing specific strategies for each destination (Senado de la República, 2022).

3.4. Hermosillo as a Development Hub for Medical Tourism

The characteristics of the city, along with its economic development and growth, have made it attractive in several ways. It stands out as an appealing and competitive city for investment. According to the World Bank's "Doing Business" index, Hermosillo was classified as a location with high potential for developing economic activities due to its general characteristics (Davis, D., et al., n.d.). These aspects also make it an attractive destination for investment in medical tourism, given its short distance from the United States and its transportation infrastructure, which can position it as a healthcare center for medical tourism. Moreover, it has qualified healthcare personnel. According to the National Statistical Directory of Economic Units (Directorio Estadístico Nacional de Unidades Económicas), Hermosillo has 1,578 healthcare units in the urban area, corresponding to 80.7%, while 19.3% are located in rural areas (Directorio Estadístico Nacional de Unidades Económicas, 2024). Table 3 shows the healthcare units by type of service distributed in the city of Hermosillo, Sonora.

Table 3. Healthcare Units in Hermosillo, Sonora.

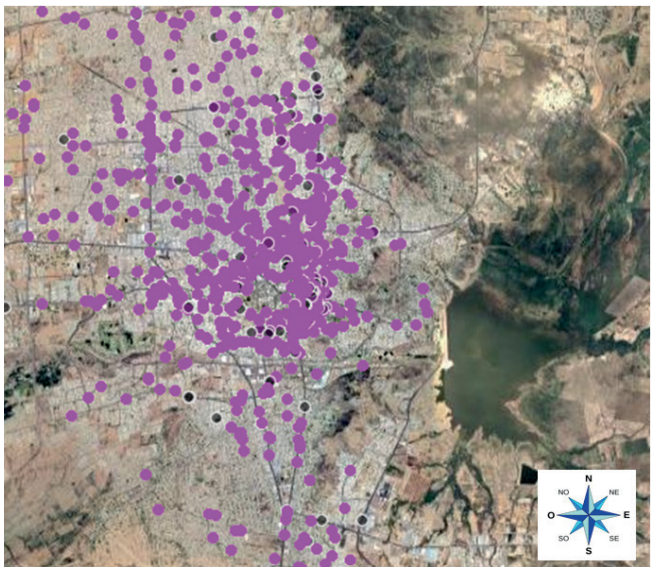
ACTIVITY	SONORA
Medical offices	850
Dental offices	399
Other health care offices	305
Outpatient care centers for patients who do not require hospitalization	24
Total	1578

Source: National Statistical Directory of Economic Units.

Among the healthcare units, 71.9% of the facilities correspond to outpatient consultation services, 13.6% to hospitalization services, and another 13.6% to support services. Additionally, by 2021 there were 317 medical offices, of which 54.6% belonged to hospitals and 45.4% to clinics. Of these, 22.4% provided general and/or family medicine, 2.25% surgery, 3.15% gynecology and obstetrics, 1.89% internal medicine, 2.83% pediatrics, 6.94% dentistry, 0.31% dermatology, 1.57% ophthalmology, 2.28% otorhinolaryngology, 11.98% psychiatry, 1.57% traumatology and orthopedics, 3.15% reproductive health/family planning, 18.92% psychology and/or mental health, 3.15% gastroenterology, 1.89% emergency medicine, 0.94% cardiology, 0.94% neurology, 3.47% urology, 2.20% oncology and dysplasia, and 13.56% other medical specialties (Data México, 2022).

The following map shows the distribution of healthcare units in the city of Hermosillo. Each point represents a healthcare unit. It is possible to observe that the highest concentration of these units is in the city center, followed by the northern and southern areas respectively.

Figure 2. Distribution of Healthcare Units in Hermosillo, concentrated mainly in the central area of the city.



Source: National Statistical Directory of Economic Units.

Regarding projections on the capacity to provide healthcare services, the city of Hermosillo has a significant supply through Higher Education Institutions with training programs related to medical tourism. These programs will ensure, in the short, medium, and long term, the availability of qualified personnel to meet market demand. In 2022, there were 63,800 higher education enrollments in Hermosillo across various fields of study, of which 52,100 were in health-related areas. Specifically, 4.08% corresponded to general nursing and obstetrics, 2.69% to general medicine, 2.21% to dentistry and general stomatology, 1.69% focused on therapy and rehabilitation, 1.67% on medical diagnosis and treatment technology, and 0.083% on medical specialties. In the service-oriented fields, gastronomy and food services accounted for 0.62%, public safety 0.46%, personal care and beauty

services 0.27%, and hospitality and tourism 0.24%. Other relevant areas for the analysis included business and commerce (3.56%), marketing (1.93%), and law (6.67%). Additionally, software development represented 2.43%, while tourism management and restaurant administration accounted for 0.7%, and information technology represented 0.53% (Data México, 2022).

Concerning the installed capacity to receive tourists, according to 2020 data, Hermosillo had 94 lodging establishments, of which 6 were classified as five-star, 21 as four-star, 12 as three-star, 14 as two-star, and 41 without classification. This represents a total of 5,855 rooms. The city also had 586 leisure establishments, such as restaurants, nightclubs, coffee shops, refreshment stands, etc., and 199 establishments dedicated to tourism-related activities, such as travel agencies, reservation services, water parks and swimming facilities, car rentals, golf courses, convention centers, tourism education centers, tourist guides, tourist assistance modules, land, water, and other types of tourist transportation, handicraft shops, among others (Datatur, 2020).

3.5. Conceptualization of the Digital Economy

Due to the constant evolution experienced in recent years with Information and Communication Technologies (ICT), it is complex to establish a single concept that encompasses everything related to this topic. In fact, the 2019 report on the digital economy by the United Nations (UNCTAD, 2019: p.4) states:

Given that the world is still in the early stages of digitalization, the evolving digital economy and several other related economic terms lack widely accepted definitions. This may reflect the rapid pace of technological progress. The time required to reach agreement on standard definitions often lags the speed of technological change (UNCTAD, 2019: p.4).

One way to understand this concept is by considering the historical context of the global economy. Until the 20th century, the economy was divided into two major categories: agriculture and industry. The industrial economy is particularly noteworthy due to the emergence of computers and the rise of the internet from the 1980s to the 2000s, which once again transformed the way products and services were produced and consumed (see Table 4). This transformation led, in the 21st century, to the globalization of data, a phenomenon known as the digital economy.

Table 4. Stages of the Industrial Revolution.

First Revolution	Second Revolution	Third Revolution	Fourth Revolution
Use of water and steam power to mechanize production.	Application of electric power to mass production.	Use of computers and ICT for production automation.	Convergence between Information Technology (IT) and Operational Technology (OT), as well as innovations such as the Internet of Things (IoT), Artificial Intelligence (AI), among others.

Source: ¨Economics of Technological Leapfrogging¨: UNIDO, 2018.

Likewise, the term "Digital Economy" reflects the changing nature of technology and its use by businesses and consumers (Barefoot et al., 2018). By the late 1990s, the process of internet adoption had matured, and the first analyses of its economic impacts emerged. During the 2000s, there was a rise in the so-called "Internet Economy" due to its significant impact on economic indicators. The definitions and topics related to the internet economy encompass the analysis of policies, digital technologies, and the growth of digitally-oriented businesses and ICTs as key players (OECD, 2012 and 2014). Moreover, in more recent studies, the focus has shifted towards the diffusion of digital technologies, services, products, and skills across economies, highlighting the influence of "digitalization" and "digital transformation" in traditional sectors and exploring cross-sectoral digitalization trends (OECD, 2016 and 2017; UNCTAD, 2017) (UNCTAD, 2019, p.4).

3.6. The Impact of the Digital Economy on Medical Tourism

Digitalization begins on the consumer side (Practice Business Solution, 2023), which creates a driving effect that establishes digital behaviors related to individual preferences in various areas such as entertainment, work, study, clothing, and lifestyle. These trends create synergy across the value chain of different industries, generating a positive impact from the large amounts of data generated by the consumer. Commercial organizations that use digital tools and applications can analyze all this consumption data, allowing them to optimize their

marketing strategies, improve customer experience, and develop products and services tailored to market needs. This approach drives business growth and profitability. This represents a digital revolution in the private business sector, with the use of digital platforms and reduced barriers to access, creating a new business environment (Valenzuela-Fernandez, Collantes-Inga & Durand-Hipólito, 2020). A digital platform is *"an environment in which users can perform tasks, manage activities, collaborate with other users, and interact through the tools and functionalities provided by the platform"* (Coppola, 2023).

This phenomenon is part of the Fourth Industrial Revolution, characterized by technologies such as 3D printing, IoT (Internet of Things), AI (Artificial Intelligence), smart cars, big data, and the on-demand economy (sharing economy). It can also include smart technologies, health technologies, renewable energies, and VR (virtual reality) (UNIDO, 2018). These technologies, driven on an unprecedented scale, complexity, and transformation, have changed how we live, work, and interact. In this context, precision and objectivity in policy formulation and governance become foundational pillars in a society marked by digitalization (Williamson & Piattoeva, 2018). On the other hand, Cisco (2020) highlights that analysts foresee regulatory changes that will drive greater technological adoption, despite the historically conservative nature of the health sector in its service models and regulations. The COVID-19 pandemic was a powerful catalyst in the digital transformation of the medical sector, allowing the identification of challenges and solutions (Ramirez Coronel, 2023). However, its impact on the tourism industry was negative (Bahena, 2020). One of the most notable changes was the use of teleconsultations, which allowed interaction between consumers and healthcare providers beyond the physical space of a medical center, encouraging service providers to adapt to consumer needs (Deloitte, 2023). "Teleconsultation, sometimes referred to as remote consultation or telehealth, refers to interactions between a doctor and a patient to provide diagnostic or therapeutic advice through electronic means" (Pan American Health Organization [PAHO], 2021). According to Marin (2022), the health sector has been one of the main protagonists of the pandemic and is undergoing a full transformation. These trends will shape the future of the sector, as it will be more integrated, digitalized, and global, with a more preventive approach than a curative one, and patients will have greater control over their health. He also mentions that the use of AI, robotics, big data, remote patient monitoring (RPM), telemedicine, apps and mobile devices, and the design of liquid hospitals will revolutionize the future of health and access to medical care. Deloitte (2023) highlights its vision for health in 2040, where the convergence of exponential technologies and consumer demands will lead to significant changes. This will allow consumers to take a more active role in decision-making about their well-being and will increase the integration and use of health data to improve medical care and patient experience. Consequently, ten emerging models that have reconfigured the traditional functions of the medical sector and health care have been explored, divided into three main interconnected categories: Data and platforms will be essential in shaping the future health ecosystem, generating key information for decision-making and establishing the foundation for a consumer-oriented environment. The focus on wellness and care provision will concentrate on offering products, care, and well-being to consumers through care centers and health communities, both in digital and physical environments. The ability to deliver care will act as the connection between funders and regulators to drive the functioning of the healthcare industry. According to Global Market Insights, the global digital health market is expected to be valued at over $600 billion by 2027, compared to $200 billion in 2020 (Destéfano, 2023). In this regard, Salesforce (2023) reports that 400 global health industry leaders discuss how to drive productivity and efficiency through AI, as well as the effectiveness of data. The main priorities for these organizations are: process optimization and cost reduction (82%), fostering trust and customer satisfaction (79%), and optimizing business functions across the organization (71%); leaders also note that the main factors affecting productivity are manual processes and isolated data between departments. Over the past three years, Mexico has seen an increase in technological investments in the private health sector, driven by new players such as Healthtech companies focused on optimizing the value chain and improving patient experience through technology (Weecompany, 2023). In this sense, the director of CONCANACO SERVYTUR Mexico states:

Digitalization is key to the growth and competitiveness of tourism in Mexico, so public-private collaboration, training entrepreneurs, and providing technological tools to micro, small, and medium-sized enterprises are essential in 2024 (Tejada, 2024).

In Mexico, 47% of the digital population visits travel websites before deciding, and 87% of these digital travelers perform searches from their mobile devices, according to a Comscore study. However, according to INEGI, only 14.3% of companies with websites manage to generate indirect income through this medium. Seventy percent of travel agents in Latin America and the Caribbean believe it is necessary to create innovative technological tools or complementary products to promote the region effectively (Concanaco Servytur Mexico, 2024). A Phocuswright report suggests six key trends that will impact tourism in 2024. The first is personalized AI to provide travel experiences tailored to individual traveler needs. The second is augmented and virtual reality, which will play an important role in travel planning by allowing travelers to explore destinations immersively. The third is voice and virtual assistants, as travelers are expected to use voice to search for information and recommendations. The fourth is automation and robotics to improve efficiency in services such as hotel check-ins. The fifth is blockchain technology, which is expected to improve payment security and the protection of personal data. Finally, the sixth trend is the subscription economy, where companies are expected to offer access to exclusive services through subscription models (Concanaco Servytur Mexico, 2024). In conclusion, Tejeda (2024) affirms that collaboration between business chambers and the government, as well as other strategic allies, plays a fundamental role in the digitalization of tourism SMEs and in promoting Mexico as a top-tier destination.

4. Conclusions

Health tourism in Mexico has experienced significant growth in recent years, and it is expected to continue with an annual growth trend of 13.5% for the period 2024-2030 (Secretary of Tourism, 2022). The industry has benefited from certified medical professionals, modern medical infrastructure, and competitive pricing, offering health tourists savings of up to 89% compared to other countries (Hernández Castillo, 2023). Additionally, Mexico surpasses the proportion of specialist doctors among general practitioners in OECD member countries (Hospital CMQ, 2023). This, combined with its geographic proximity to the U.S. market—considered one of the most expensive healthcare systems globally, with around 30 million uninsured Americans—has generated a 70% income for the national medical sector due to the influx of U.S. tourists (CIAD, 2015). Hermosillo offers a strong educational offering related to medical tourism, ensuring the availability of qualified personnel in the future (Data México, 2022). The city also has 879 establishments to host tourists, including lodging, recreation, and tourism activities (Datatur, 2020). However, sector experts point out the lack of joint strategies to attract more patients, train personnel, and create an appropriate legal framework (Luna, 2023). For example, the Sonora Cluster, while not mentioned in its development plans, seeks to promote a binational network with the main providers of Medical and Wellness Tourism and position the Sonora-Arizona megaregion at a regional and international level (Deloitte, 2019).

It is important to note that the growth of medical tourism creates the potential to boost the local medical industry and the development of new digital business models, such as Healthtech or online health insurance initiatives, e-prescriptions, teleconsultations, and digital pharmacies. Consequently, this will revolutionize the interaction between consumers and healthcare providers, driven by greater connectivity of data, compatible, accessible, and secure platforms, and increasing consumer participation, creating a new business environment. In this sense, precision and impartiality in policy development and governance are crucial in a society marked by digitalization, as Williamson and Piattoeva (2018) argue. Cisco (2020) suggests that regulatory adjustments are expected to drive greater technological integration, despite the healthcare sector's traditional caution in service approaches and regulations. These changes, though drastic, may be carried out progressively. For example, 400 global health industry leaders discuss how to drive productivity and efficiency through AI, as well as data effectiveness, aiming to reduce costs and optimize processes, foster trust and customer satisfaction, and optimize business functions across the organization (Salesforce, 2023). Therefore, digitalization plays a fundamental role

in the development and competitiveness of tourism in Mexico. Public-private collaboration, training entrepreneurs, and providing technological tools to micro, small, and medium-sized enterprises are essential in 2024. In summary, Hermosillo should leverage its medical tourism capacity and Mexico's favorable position in the digitalization index to offer medical tourism services both nationally and internationally through the digital economy. This can be achieved by implementing digital platforms that facilitate collaboration among various service providers in the industry to promote, guide, and market services offered from a medical and tourism perspective in the region. Furthermore, the data generated from this strategy will provide a deeper understanding of the consumer, opening opportunities for continuous improvement. This initiative not only optimizes the value chain but also enhances the patient's journey. In this regard, healthcare actors aiming to evolve must understand that the transition to a consumer-centric approach is not about digitizing existing work methods and operations, but reinventing operational models based on the consumer, prioritizing the improvement of their experience and strategically and coherently implementing digitalization. Deloitte (2023) emphasizes that healthcare actors who identify their customers' needs and understand how they should evolve will be better prepared to meet the demands of future consumers. By doing so, they will be able to maintain their relevance and competitiveness in an increasingly consumer-centric healthcare environment. Leveraging the opportunities provided by the digital economy for health tourism in Hermosillo, Sonora, is essential for boosting economic growth and increasing the region's competitiveness. At the same time, it will pave the way for a future where excellence in healthcare, interconnectedness across the value chain, and patient experience merge into a unique and attractive offering for the national and international market, as well as for new generations.

References

Alonso, M, (2010). Análisis de la cadena de valor turística en Uruguay. Asistencia Técnica para el diseño de políticas de promoción de la producción sustentable y el empleo. Recuperado de: http://apps.mintur.gub.uy/pmb/opac_css/index.php?lvl=notice_display&id=1774

Alvarado, M, (2018). Los pacientes de EU y Canadá prefieren a dentistas mexicanos. Recuperado de:https://expansion.mx/economia/2018/08/07/los-pacientes-de-eu-y-canada-prefieren-a-dentistas-mexicanos

Ayala Espinosa, C. (2023, 21 julio). Turismo médico, oportunidad para otros segmentos de la economía de los estados.

Bahena, R. (27 de junio de 2020). Turismo de los más afectados en Sonora por COVID-19. El Sol de Hermosillo. Recuperado https://www.elsoldehermosillo.com.mx/finanzas/turismo-de-los-mas-afectados-en-sonora-por-covid-19-5420440.html

Banco Nacional de Comercio Exterior. (2022, 8 agosto). México es el segundo destino de turismo de salud a nivel mundial. Blog Bancomext. https://www.bancomext.com/blog-bancomext/mejora-tu-hotel/mexico-es-el-segundo-destino-de-turismo-de-salud-a-nivel-mundial/

Cárdenas, P. (2020). Tiene Sonora 38 instituciones de salud privadas, solo dos se han sumado a estrategia federal. Recuperado de: https://proyectopuente.com.mx/2020/04/23/tiene-sonora-38-instituciones-de-salud-privadas-solo-dos-se-han-sumado-a-estrategia-federal/.

Centro de Investigación en Alimentación y Desarrollo (2015). EL TURISMO DE LA SALUD, UNA OPORTUNIDAD DE DESARROLLO ECONÓMICO REGIONAL. Recuperado de: https://www.ciad.mx/el-turismo-de-la-salud-una-oportunidad-de-desarrollo-economico-regional

Comercio Exterior, Países con Tratados y Acuerdos firmados por México. recuperado https://www.gob.mx/se/acciones-y-programas/comercio-exterior-paises-con-tratados-y-acuerdos-firmados-con-mexico

Connell,J. (2013). Contemporary medical tourism: conceptualization, culture and commodification, Tourism Management. Recuperado de: https://www.sciencedirect.com/science/article/pii/S0261517712000970.

Consejo consultivo de Turismo Médico de la Secretaría de Turismo. Recuperado de: https://dof.gob.mx/nota_detalle.php?codigo=5496034&fecha=04/09/2017#gsc.tab=0

Data México, (2022). Acerca de Hermosillo. Recuperado de: http://www.economia.gob.mx/datamexico/es/profile/geo/hermosillo?educationDegree2=academicDegree11&hearlthAreas=urbanHealth&redirect=true% educationDegree=academicDegree12

Datatur (2020). Compendio Estadístico. Recuperado de: https://www.datatur.sectur.gob.mx/ITxEF/ITxEF_

SON.aspx.

Davis, D., et. al., (n.d.). Rethinking Hermosillo. Recuperado de: https://www.implanhermosillo.gob.mx/wp-content/uploads/2018/08/Rethinking-Hermosillo-2017_09_27-Spanish-1.pdf

Deloitte, (2019). Oportunidades de mercado y perspectivas del turismo de salud en México. Recuperado de: https://www2.deloitte.com/content/dam/Deloitte/mx/Documents/bienes-raices/2019/Turismo-de-Salud-en-Mexico.pdf.

Deloitte. (2021, 21 octubre). Presente y futuro de la Salud Virtual. Deloitte Insights. https://www2.deloitte.com/content/dam/Deloitte/cl/Documents/life-sciences-health-care/future-of-health/cl-futuro-de-la-salud-2022.pdf

Deloitte. (2023, 26 enero). El futuro de la salud en América Latina. Deloitte México. https://www2.deloitte.com/mx/es/pages/life-sciences-and-healthcare/articles/2022-global-health-care-outlook.html

Destéfano, D. (2023, 2 agosto). El mercado mundial de salud digital superaría los 600.000 millones de dólares para 2027. Revista Más Industrias. https://masindustrias.com.ar/el-mercado-mundial-de-salud-digital-superaria-los-600-000-millones-de-dolares-para-2027/

El Economista. https://www.eleconomista.com.mx/estados/Turismo-medico-oportunidad-para-otros-segmentos-de-la-economia-de-los-estados-20230721-0019.html

El financiero. (2023, 15 noviembre). México, epicentro del turismo médico global. El Financiero. https://www.elfinanciero.com.mx/opinion/de-jefes/2023/11/15/mexico-epicentro-del-turismo-medico-global/

Gobierno del Estado de Sonora (2021). Sonora entre los estados con mayor crecimiento en inversión extranjera: Vidal Ahumada. Recuperado de: https://economiasonora.gob.mx/portal/prensa/noticias/1153-sonora-entre-los-estados-con-mayor-crecimiento-en-inversion-extranjera-vidal-ahumada

Gobierno del Estado de Sonora. (2023, 23 octubre). Afianzamos relación binacional con nueva estructura Comisión Sonora-Estados Unidos: Alfonso Durazo. https://www.sonora.gob.mx/gobierno/acciones/gobernador/afianzamos-relacion-binacional-con-nueva-estructura-comision-sonora-estados-unidos-alfonso-durazo

Gobierno del Estado de Sonora. (2024, 16 febrero). Coordinación Ejecutiva de Enlace Internacional. Gobierno de Sonora. https://enlaceinternacional.sonora.gob.mx/index.php/acerca-de

Healthcare and Life Sciences Insights. (2023.). Salesforce. Recuperado de: https://www.salesforce.com/resources/research-reports/healthcare-life-science-insights-report/?d=7013y000002KWHAAA4&gad_source=1&gclid=CjwKCAiAzJOtBhALEiwAtwj8thiX6LHRlUHlOBbFNKsVogntyMUkLiVe-lhJOexLYqhqN1Tu1AjHjBoCsaIQAvD_BwE&gclsrc=aw.ds

Hernández Castillo, A. (2023, 25 octubre). México, el segundo país del mundo que recibe más turismo de salud. El País México. Recuperado de: https://elpais.com/mexico/2023-10-25/mexico-el-segundo-pais-del-mundo-que-recibe-mas-turismo-de-salud.html.

Hospital CMQ. (2023, 27 febrero). Turismo Médico en México - Hospital CMQ. https://hospitalcmq.com/es/turismo-medico/turismo-medico-en-mexico/

Informe anual de actividades Sonora 2021-2022 Recuperado de: https://estrategia.sonora.gob.mx/images/2023/Informes_2022/SERVICIOSS.pdf

Instituto Nacional de Estadística y Geografía (2022). CUENTA SATÉLITE DEL SECTOR SALUD DE MÉXICO, 2021. Recuperado de: https://www.inegi.org.mx/contenidos/saladeprensa/boletines/2022/CSSS/CSSS2021.pdf.

Instituto Nacional de Estadística y Geografía (2024). Directorio Estadístico Nacional de Unidades Económicas (2024). Recuperado de: https://www.inegi.org.mx/app/mapa/denue/default.aspx.

La coordinación de la Representación de Sonora-Arizona es una unidad administrativa de la Secretaría de Economía que tiene atribuciones. Recuperado: https://economiasonora.gob.mx/sonora-arizona/

López, E. (2019, 4 noviembre). Sonora tiene «buen diagnóstico» en turismo de salud. EL IMPARCIAL. https://web.archive.org/web/20230822174000/https://www.elimparcial.com/sonora/sonora/Sonora-tiene-buen-diagnostico-en-turismo-de-salud-20191103-0004.html

Luna, A. (2023, 27 octubre). El turismo médico en México atrae un millón de pacientes al año. Infobae. https://www.infobae.com/mexico/2023/10/27/el-turismo-medico-en-mexico-atrae-un-millon-de-pacientes-al-ano/

Marin, J. (2022, 21 abril). Doce tendencias para el sector de la salud. Forbes Argentina. Recuperado de: https://www.forbesargentina.com/columnistas/doce-tendencias-sector-salud-n15070

Mordor Intelligence. (s. f.). Mercado de turismo médico Insights. https://www.mordorintelligence.com/es/industry-reports/medical-tourism-market

Network Readiness Index 2021, tercera edición, Forbers. Recuperado de: https://www.forbes.com.mx/red-forbes-the-network-readiness-index-2021-nri-las-evaluaciones-en-el-diagnostico-de-preparacion-

digital-mas-completas-del-mundo/

Normas Oficiales Mexicanas NMX-COF-001-SCFI-2018. Recuperado de: https://dof.gob.mx/nota_detalle.php?codigo=5559015&fecha

OMT & CET. (2018). Exploring Health Tourism – Executive Summary. World Tourism Organization (UNWTO) and the European Travel Commission (ETC). Recuperado de: https://doi.org/10.18111/9789284420308

OPS. (2021, 16 abril). 8 Principios para la transformación digital del sector salud. OPS/OMS | Organización Panamericana de la Salud. Recuperado de: https://www.paho.org/es/8-principios-para-transformacion-digital-sector-salud

OPS. (2023). Preparación tecnológica en salud pública. Recuperado de: https://iris.paho.org/handle/10665.2/57024

Organización de turismo médico. Buscan detonar turismo de salud en el Sur de Sonora. Recuperado de: https://turismomedico.org/buscan-detonar-turismo-de-salud-en-el-sur-de-sonora/

Organización Mundial de Salud. (2019,20 febrero). Los países están gastando más en salud, pero las personas siguen pagando demasiado de sus bolsillos. WHO. https://www.who.int/es/news/item/20-02-2019-countries-are-spending-more-on-health-but-people-are-still-paying-too-much-out-of-their-own-pockets

Pineda, N., (n.d.). ¿Buenas cuentas en salud y educación en Sonora? Recuperado de: https://www.colson.edu.mx/coldetalle.aspx?cx=2733

Practics Business Solutions.(2023, 15 diciembre). Cómo ha evolucionado el comportamiento del consumidor en la era digital. https://www.practicsbs.com/el-consumidor-en-la-era-digital/

PROMÉXICO (2013). TURISMO DE SALUD. Recuperado de: https://embamex.sre.gob.mx/canada/images/2013/turismo_de_salud_esp.pdf.

Ramírez Coronel, M. (2023, 16 abril). La digitalización en salud se acelera. El Economista. Recuperado de: https://www.eleconomista.com.mx/opinion/La-digitalizacion-en-salud-se-acelera-20230416-0069.html

Rubio, J. A. (2023). Destacan el tema Operatividad del Corredor Sonora-Arizona en tiempos de covid 19 – Dirección de Comunicación. Dirección de Comunicación Unison. https://direccciondecomunicacion.unison.mx/destacan-el-tema-operatividad-del-corredor-sonora-arizona-en-tiempos-de-covid-19/

Secretaria de salud (2020). I N F O R M E DE LOGROS Y AVANCES DEL PROGRAMA SECTORIAL DE SALUD 2020. Recuperado de: https://salud.sonora.gob.mx/images/informes-y-resultados/Informe_de_Logros_y_Avances_2020_del_Programa_Sectorial_de_Salud.pdf.

Secretaría de Turismo (2022). Turismo de Salud se consolida gracias al trabajo de los tres órdenes de gobierno y el sector privado. Recuperado de: https://www.gob.mx/sectur/prensa/turismo-de-salud-se-consolida-gracias-al-trabajo-de-los-tres-ordenes-de-gobierno-y-el-sector-privado?idiom=es

Senado de la República. (2022, 5 noviembre). Coordinación de Comunicación Social - Aprueba Senado reforma para fomentar turismo médico. Comunicación Social Senado. https://comunicacionsocial.senado.gob.mx/informacion/comunicados/4189-aprueba-senado-reforma-para-fomentar-turismo-medico

Servytur, C. (2024, 2 enero).Concanaco Servytur - Digitalización del turismo, clave para su crecimiento en el 2024: CONCANACO. Concanaco Servytur México. https://www.concanaco.com.mx/prensa/comunicados/digitalizacion-del-turismo-clave-para-su-crecimiento-en-el-2024-concanaco

Tratado de Libre Comercio, México, Estados Unidos de America y Canadá. CAPITULO 19. Recuperado de:, https://www.gob.mx/t-mec/acciones-y-programas/textos-finales-del-tratado-entre-mexico-estados-unidos-y-canada-t-mec-202730?state=published

UNCTAD. (2019, 4 septiembre). Digital Economy Report 2019. Recuperado de: https://unctad.org/publication/digital-economy-report-2019

Valenzuela-Fernández, Luis, Zoila Collantes-Inga y Eduardo Durand-Hipólito. 2020. "Sobre la gobernanza digital, política digital y educación". Eleuthera 22 (2): 88-103. https://doi.org/10.17151/eleu.2020.22.2.6.

Ventura, V. (2011) El turismo, su cadena productiva, y el desarrollo incluyente en América Latina: los casos de Brasil y México. Recuperado de: https://redlatn.flacso.org.ar/wp-content/uploads/2014/09/WP_138_FLA_SCCI_Ventura.pdf

WeeCompany. (2023, 3 julio). Grandes inversiones tecnológicas en industria de la salud. Forbes México. Recuperado de: https://www.forbes.com.mx/ad-transformacion-digital-sector-salud-mexico-weecompany-medicina/

Williamson, Ben, y Nelli Piattoeva. 2018. "Objectivity as Standardization in Data-scientific Education Policy, Technology and Governance". Learning, Media and Technology 10: 64-76. https://doi.org/10.1080/17439884.2018.1556215.

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Performance Evaluation and Improvement Intention among Employees in Manufacturing Companies

Evaluación de Desempeño e Intención de Mejora en Empleados de Empresas Manufactureras

Date received: February 26, 2024

Date of approval: June 3, 2024

Nora Veronica Rosales Padilla[1], Carmen Estela Carlos-Ornelas[2], María Teresa Gómez García[3]

[1] Master's Degree in Administrative Management from Instituto Tecnologico de Aguascalientes. Development Manager at VisionNET Solutions.
Email: G21153073@aguascalientes.tecnm.mx.ORCID:https://orcid.org/0000-0001-7997-3320

[2] PhD in Management from Universidad Autonoma de Aguascalientes. Research Professor at Tecnologico Nacional de Mexico, Aguascalientes Campus. Member of the National System of Researchers.
Email: carmen.co@aguascalientes.tecnm.mx ORCID: https://orcid.org/0000-0002-8516-2062

[3] Master of Science in Chemical Engineering from Instituo Tecnologico de Aguascalientes. Lecturer at Tecnologico Nacional de Mexico, Aguascalientes Campus.
Email: ma.teresa-gg@aguascalientes.tecnm.mx ORCID: https://orcid.org/ 0009-0000-6816-0623

Abstract

The improvement intention that precedes employees' improvement behavior is a key factor for companies seeking to achieve their organizational goals. This study examined the influence of two variables from Performance Evaluation (PE): supervisor diligence and subordinates' reactions to the PE meeting. Thirteen control variables were included in the analysis, consisting of seven demographic variables and six factors related to performance evaluation, such as individualized consideration, relationship, supervisor support, procedural justice, PE accuracy, and satisfaction with PE. Data were collected using a questionnaire developed by McClendon et al., and responses were obtained from 224 employees working in automotive manufacturing companies located in the city of Aguascalientes. The reliability coefficients of the questionnaire were high, indicating strong consistency in the responses. A multiple regression analysis revealed an explanatory model accounting for 45.6% of the variance in improvement intention, highlighting the significant contribution of feedback and supervisor diligence, without the inclusion of control variables. In this context, feedback emerged as the key factor, suggesting that allocating organizational resources to supervisor training could generate greater benefits in employees' improvement behavior. These findings underscore the importance of feedback and supervisor diligence as critical elements in fostering employees' improvement intention.

Keywords: Performance evaluation, implement intention, supervisor.

JEL Code: M12

Resumen

La intención de mejora que precede al comportamiento de mejora de los empleados es un factor primordial para que las empresas que los emplean logren sus objetivos. Este estudio examinó la influencia de dos variables de la Evaluación del Desempeño (ED): la diligencia del supervisor y las reacciones de los subordinados a la reunión de ED. Se incorporaron al análisis 13 variables de control, que incluyeron 7 demográficas y 6 factores relacionados con la evaluación del desempeño, tales como consideración individualizada, relación, apoyo del supervisor, justicia procedimental, precisión de la ED y satisfacción con la ED. Los datos se recopilaron a través de un cuestionario proporcionado por McClendon et al. y se obtuvieron respuestas de 224 empleados de empresas manufactureras automotrices de la ciudad de Aguascalientes. Los coeficientes de confiabilidad del cuestionario fueron altos, indicando una consistencia robusta en las respuestas. Un análisis de regresión múltiple reveló un modelo explicativo del 0.456 de la

varianza en la intención de mejora, destacando la contribución significativa de los factores de retroalimentación y diligencia del supervisor, sin la inclusión de las variables de control. En este contexto, la retroalimentación se destacó como el factor clave, sugiriendo que la asignación de recursos organizacionales para la capacitación de supervisores podría generar mayores beneficios en el comportamiento de mejora de los empleados. Estos hallazgos resaltan la importancia de la retroalimentación y la diligencia del supervisor como elementos críticos en el impulso de la intención de mejora entre los empleados.

Palabras clave: Evaluación del desempeño, intención de mejora, supervisor.

Código JEL: M12 - Gestión de personal

1. Introduction

Employee Performance Evaluation (PE) aims, among other objectives, to provide guidance and motivation to improve performance in order to increase individual contributions to the achievement of both organizational and employee goals. Performance Evaluation is not a recent practice; it has existed since one person began employing another. In the Middle Ages, the Society of Jesus already implemented a PE system for each Jesuit spreading the Catholic religion around the world. Around 1842, the United States civil service established an annual performance reporting system for its employees; by 1880, the U.S. Army began using a similar approach; and in 1918, General Motors implemented a system to evaluate its executive staff. However, it was only after World War II that PE systems began to be widely adopted by organizations (Chiavenato, 2017).

Throughout the decades, various authors, such as Chiavenato (2017) and Robbins (1998), have emphasized that Performance Evaluation must align with the strategic nature of the organization, inspired by its vision, mission, and the objectives that define the expected outcomes over a period of time. Performance evaluation systems involve a subjective dimension based on personal judgment since they require evaluators to supervise and make value judgments about their subordinates' performance. These judgments influence both organizational variables, such as productivity and work environment, and personal variables, such as improvement intention, job retention, career opportunities, and salary, among others.

In the context of evaluation, the implementation of various indicators is expected to ensure objectivity in job performance. From this perspective, a PE system that is well-designed, developed, and evaluated would generate both short- and long-term benefits for the employee being evaluated, their supervisor, the organization, and the community (Chiavenato, 2017).

Interest in improving PE has been increasing in recent years (Pulakos et al., 2019). For decades, organizational scholars such as Whetten and Cameron (2005) and Gerhart (2003) have argued that an employee's performance results from the combination of ability and motivation. From this perspective, ability is the result of aptitude, training, and resources, while motivation stems from desire and commitment. Surprisingly, the supervisor's role and their performance in this process have been underestimated.

This study aims to explain the relationship between the supervisor's performance in the performance evaluation process and subordinates' intention to improve their performance in automotive companies in the city of Aguascalientes. It seeks to anticipate how the supervisor's actions will affect employees' willingness to improve their work performance, whether positively or negatively. By predicting this relationship, valuable information will be provided so that manufacturing companies can guide their processes related to supervisor training, performance evaluation systems, and continuous improvement programs, among others.

2. Literature Review

Effective management of organizations requires an understanding of employee performance in their current roles and their potential for development in future positions. This knowledge is essential to implement actions that promote continuous improvement, enabling employees to contribute effectively to achieving organizational goals and facilitating their career advancement.

In this context, Performance Evaluation (PE) takes on significant importance and is systematically

practiced in numerous organizations worldwide. However, the way it is carried out can vary considerably between organizations, as can the level of improvement achieved in employees and their satisfaction with the evaluation process. The diversity of alternatives for conducting this process highlights the need to adapt PE practices to the particularities of each organizational environment.

Although PE is an essential practice and a basic tool in human resources management, along with the continuous efforts made by organizations to improve this process, there remains considerable dissatisfaction with the way it is carried out (Cappelli & Conyon, 2018). Existing literature on this topic often focuses on improving employee productivity and work performance, addressing skills ranging from conceptual, technical, and professional to interpersonal and social skills for middle management and executives. However, little attention is given to the supervisor's skills, who represents the primary link between employees and the chain of command in organizations. Therefore, it is essential for supervisors to develop the necessary skills to manage relationships effectively with employees in PE processes within organizations.

According to Pichler et al. (2016), previous research has explored links between various variables and PE, but few studies have focused on its relationship with the intention to improve. This gap in the literature highlights the need for further examination of how PE, especially in relation to supervisor skills, influences employees' willingness to improve and develop professionally.

The success of a performance evaluation is not only based on an objective, specific methodology aimed at personal and organizational progress, but also on the quality of the relationship between the employee and the evaluator. This relationship conditions the employee's perception of the process and has a direct impact on their behavior. It can generate an intention to improve when conducted constructively, or, under adverse conditions, it can become a source of complaints, criticisms, and dissatisfaction.

Therefore, this study focuses on analyzing the factors linked to the supervisor's involvement in the PE process of their subordinates. The aim is to understand how this involvement can condition the improvement of employees' performance by recognizing the importance of the supervisor-employee relationship in the success of the evaluation and its potential impact on individual career development.

Given the difficulties in directly measuring the improvement of employees performing diverse tasks, the focus has shifted to analyzing the impact not on improvement itself, but on the intention to improve. This approach recognizes the complexity of directly comparing results in heterogeneous job functions and instead centers on understanding employees' willingness and commitment to improvement. By examining the intention to improve, the goal is to capture employees' attitudes and commitment to personal and professional development, offering valuable insight in work environments with divergent roles and responsibilities.

2. 1 The Intent to Improve

The intention to improve task performance refers to the deliberate plans individuals make to enhance their task performance (Uziel et al., 2022). It involves a person's purpose or will to make changes or progress in their work outcomes, demonstrating continuous effort with the goal of optimizing their performance within an organizational context. This intention reflects personal commitment to both growth and high-level task execution. Implementation intentions have a medium to large effect on the successful achievement of goals and are especially effective in protecting goal efforts from undesired influences (Gollwitzer & Sheeran, 2006).

The Theory of Planned Behavior, proposed by Ajzen (1991), posits that behavior acts as a mediator between intentions and actions. It is considered an immediate antecedent of behavior and an indicator of an individual's readiness to perform a specific action. The theory aims to explain and predict human actions through three key predictors, which gain weighted importance based on the behavior in question and the population of interest. These predictors are used to understand and forecast how individual intentions translate into concrete behaviors. The fundamental predictors of the Theory of Planned Behavior are: attitude toward the behavior, subjective norms, and perceived behavioral control. The attitude toward the behavior reflects an individual's general disposition toward a specific action, depending on their subjective evaluation of that behavior. It includes beliefs about the consequences of performing the behavior and the value placed on those consequences as positive or

negative. In summary, the attitude toward behavior represents an individual's overall orientation and subjective evaluation of performing a particular action. The predictor of subjective norms refers to the influence of significant others' opinions and expectations on individuals. Subjective norms reflect the perceived social pressure to perform or avoid a specific behavior. The perception of how relevant others view or expect certain behavior can exert significant influence on an individual's decisions and actions. These predictors are key components in understanding individuals' intentions and actions according to the Theory of Planned Behavior, providing a conceptual framework to analyze and predict human behavior in various contexts.

Perceived behavioral control, as the third predictor in the Theory of Planned Behavior, refers to an individual's belief in their ability to successfully perform a specific behavior. This perception takes into account factors such as the availability of resources, personal skills, and the identification of potential obstacles that might influence the behavior's execution. In summary, perceived behavioral control reflects the confidence an individual has in their ability to perform or avoid a particular action. This belief in one's capacity to influence the outcome of the behavior plays an important role in the formation of intentions and the subsequent execution of specific actions.

Thus, intention is formed by considering whether the individual positively values the behavior, perceives that others approve or disapprove of it, and believes they have control over performing the behavior. Therefore, the supervisor's role in their relationship with subordinates is crucial, particularly in the performance evaluation process where they express positive or negative assessments, approval or disapproval, and encourage or discourage confidence in the subordinate's ability to perform in a specific way. However, it should be noted that, while intention is a strong predictor of future behavior, the relationship is not perfect, as other factors, such as external limitations or changes in circumstances, may also influence the translation of intention into action.

2.2 Performance Evaluation

For the primary purpose of performance evaluation to be achieved—providing an accurate and reliable description of how an employee performs their job responsibilities—evaluation systems must be directly linked to the job position and be practical and trustworthy.

Although there is no universally accepted definition of Performance Evaluation (PE) in the literature (Culbertson et al., 2013), it can be conceived as an ongoing process that involves the tasks of identifying, measuring, and developing individual and team performance. The aim of this process is to align PE with the strategic objectives of organizations (Aguinis et al., 2012). Essentially, PE seeks to provide a comprehensive and objective view of how employees contribute to the achievement of organizational goals, identify areas for improvement, and facilitate the continuous development of both employees and organizations. Performance evaluation can be conducted in various ways, with methods varying depending on the organizational focus and objectives. Some of the main evaluation forms include:

Supervisor Evaluation. In this method, each manager evaluates their subordinates, based on the idea that the direct supervisor is most familiar with both the subordinate's job position and their performance.

Self-Evaluation. In this approach, each employee critically analyzes their own performance within the organization, offering a unique perspective based on their personal experience.

Peer Evaluation. This method involves mutual evaluation between individuals at the same level or position in the organization. It is considered a useful predictor of performance and can offer valuable insights from coworkers in similar roles.

Subordinate Evaluation. Here, employees evaluate their managers. This type of evaluation can increase supervisors' awareness of their impact on subordinates and improve communication and relationships within the hierarchy.

Customer Evaluation. In some specific contexts, customers may provide evaluations of the performance of an individual in a specific role, especially when customer interaction is a key part of the job.

360-Degree Evaluation. This approach incorporates all the above forms of evaluation. It involves feedback from supervisors, subordinates, peers, customers, and self-evaluation. Despite its administrative complexity, the 360-Degree

Evaluation aligns with total quality management approaches and provides high satisfaction levels among those evaluated. This method offers a comprehensive and balanced view of performance by incorporating feedback from various stakeholders such as supervisors, subordinates, peers, and customers.

This study analyzes supervisor-led performance evaluation. Following part of McClendon et al. (2020)'s methodology, two aspects related to the supervisor's execution of the performance evaluation system were considered as independent variables: supervisor diligence and reactions to the performance evaluation meeting. These aspects play a decisive role in employees' perceptions and responses to the evaluation of their performance.

To provide further clarity and support for the expected positive relationship between the supervisor's execution of tasks and the employee's intention to improve in the research model, six additional factors directly related to the supervisor were incorporated, based on McClendon et al. (2020). These factors might also have a relationship with the variables of execution and the intention to improve. The additional factors are: individualized consideration, relationship, supervisor support, procedural justice, performance evaluation accuracy, and satisfaction with performance evaluation.

These factors were incorporated as control variables to analyze alternative regression models. This approach helps isolate the net effect of the independent variables on the dependent variable, minimizing potential bias or confusion from other variables. Including these factors as control variables ensures that the influence of execution variables on the intention to improve is not erroneously attributed to omitted variable bias or the presence of other unconsidered variables.

2.2.1 Supervisor Diligence

In this study, evaluator diligence is defined as the effort the supervisor dedicates to implementing the formal Performance Evaluation (PE) system. Although previous research has explored expressions of supervisor diligence, such as knowledge of performance standards (Pichler et al., 2017), the importance of focusing on compliance in the overall performance management process has been highlighted (Schleicher et al., 2018). However, there has been limited research specifically focusing on supervisor diligence in executing the PE process.

A lack of diligence from the supervisor in performance evaluation may suggest to subordinates that both the supervisors and the organization are less committed to diligence at work. In this regard, Biron, Farndale, and Paauwe (2011) found that business practices, some of which were related to supervisor diligence, led employees to infer management's general concern about performance management issues, thereby influencing their behavior and attitudes.

2.2.2 Reactions to the PE Meeting

Reactions refer to the consequence or outcome of a specific action and the way an individual responds to a particular stimulus. In the context of performance evaluation (PE), employees' reactions have become a useful indicator for assessing the success of the system.

Understanding employees' views on PE is crucial for determining the acceptance or rejection of the evaluation tool used within the company. Employees' reactions provide valuable perspectives on how they perceive and experience the evaluation process, which can significantly impact their engagement, job satisfaction, and overall performance. Therefore, understanding and addressing employees' reactions may be essential for optimizing the effectiveness and acceptance of PE systems within organizations.

According to Weinert (1985), employees' reactions and feelings towards their work situation are generally considered attitudes. Key areas of interest include affective and cognitive aspects such as behavior dispositions toward work, the work environment, colleagues, supervisors, and the organization as a whole. One of these attitudes is job satisfaction, which refers to their reactions, sensations, and feelings related to employment.

The study of employee attitudes is essential to understand their emotional and cognitive perspective on various work aspects. Job satisfaction, in particular, can influence motivation, employee retention, and overall performance in the workplace. Therefore, understanding and managing these attitudes is crucial for fostering a positive and productive work environment.

Employees' behaviors, especially their reactions to performance evaluation, are critical for ensuring the system's effectiveness, as they are intrinsically

linked to affective and cognitive aspects that influence job satisfaction. The psychological impact of performance evaluation can significantly affect employees' perceptions of their work and overall commitment to the organization. Consequently, understanding and managing employee behaviors in response to PE is vital for promoting motivation and productivity, as well as cultivating a healthy work environment.

2.2.3 Individualized Consideration

Individualized consideration involves the supervisor's sincere and honest concern for the needs of their subordinates and the search for appropriate ways to meet them. Although many team leaders might claim they care for the individuals in their team and seek to meet their needs in an individualized way, the perspective of the subordinates may not fully align with the supervisors' perception. It is interesting to note that no previous studies were identified on the interaction between individualized consideration and responses to feedback in the context of performance evaluation (PE). This gap in the literature highlights an opportunity to explore and better understand how a supervisor's individualized consideration may influence employees' responses to feedback received during performance evaluations.

2.2.4 Relationship

In the workplace, the way supervisors interact with their subordinates has a significant impact on the company's atmosphere, influencing their perception of equity (Smith et al., 1996). This supervisor-subordinate relationship includes various characteristics associated with the hierarchical relationship between a supervisor and a subordinate, which involves a structure of authority in which the former holds a position of greater power and responsibility compared to the latter. The supervisor: has the authority to direct and guide the subordinate's activities to meet the goals and objectives set by the organization; is responsible for monitoring the subordinate's work and providing feedback, solving problems, and making decisions about the work and performance of the subordinate, assigning tasks, and setting priorities.

The supervisor is expected not only to tell subordinates what and how things should be done and supervise compliance with their orders impartially, but also to set an example for them and encourage them to strive to imitate their work and leadership. For their part, the subordinate must report to the supervisor, so communication between them is essential for an effective hierarchical relationship. The image a subordinate has of their supervisor depends on the supervisor's prestige and the professional and personal qualities they demonstrate. The better the supervisor's image, the more security it will generate in the subordinate, and the more likely they are to accept their direction, which will contribute to creating a mutual support environment that benefits both parties and promotes a positive and productive work atmosphere.

2.2.5 Supervisor Support

The supervisor can provide guidance, training, and professional development opportunities to the subordinate to help them reach their full potential at work. Additionally, the supervisor plays an important role in PE by informing them of the expectations and standards they are expected to meet in their job activities. The supervisor is expected to offer support to subordinates in a friendly, honest, and fair manner using various resources (Ali et al., 2020). The support provided and the perception of equity generated are key determinants for the positive outcomes of performance feedback meetings (Rotundo & Sackett, 2002). According to Eisenberger et al. (2002), research such as that by Afzal, Arshad, and Farooh, has revealed that supervisor support has positive effects on variables such as: job satisfaction, autonomy, commitment, trust, responsible behavior, perception of organizational support, cohesion, employee retention, career satisfaction, turnover intention, and job permanence. From the employee's perspective, supervisor support reflects the organization's favorable or unfavorable attitude toward them. This support significantly contributes to employee well-being and job satisfaction.

2.2.6 Procedural Justice

The importance of justice and equity in organizations has been recognized by professionals from many different disciplines. Psychology, in particular, has validated the idea that justice is important in all organizational environments by observing how it impacts different aspects of an organization. The control individuals have over the processes they participate in influences how they perceive the fairness of those procedures. Individuals see procedures as fairer when participants have

more control over them (Konovsky, 2000, p. 26): the more control employees have over the performance evaluation process, the more likely they are to consider it fair. In the context of performance evaluation, four types of justice perceptions are recognized: procedural justice, distributive justice, interactional justice, and informational justice (Whetten & Cameron, 2005). Procedural justice refers to the fairness of the procedures used to make decisions, both in terms of the outcomes and the methods, mechanisms, and processes used to determine those outcomes.

2.2.7 Accuracy of Performance Evaluation

In performance evaluation, accuracy is fundamental both conceptually and practically. However, measuring accuracy is complex as it involves considering the overall performance of all those evaluated to facilitate the identification of strengths and weaknesses, assigning scores in relation to the global performance of all those assessed.

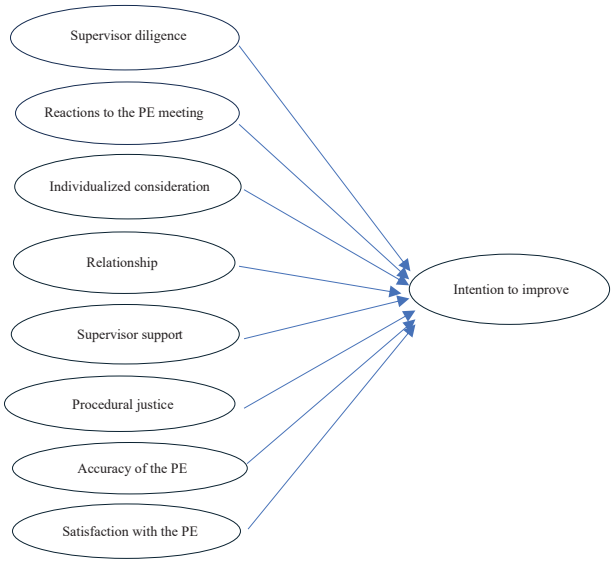
The evaluator must be able to distinguish and classify those evaluated in each work dimension, detecting differences in performance patterns across the various evaluation dimensions. Some studies on the subject have been controversial and criticized, especially when they focus on cross-sectional data rather than considering the relationships that arise after feedback (Konovsky, 2000). Accuracy in performance evaluation is essential to ensure a fair and useful assessment for employee development.

2.2.8 Satisfaction with Performance Evaluation

Employee satisfaction regarding performance evaluation has primarily been conceptualized in three ways: satisfaction with the PE interview, satisfaction with the PE system, and satisfaction with performance ratings (Nair & Salleh, 2015). The satisfaction levels reported with the PE system are clearly related to the perceived justice of the system (DeNisi & Kluger, 2000). The premise is that motivated people will work toward goals for which they expect a fair reward when they achieve them.

In order to analyze the influence of supervisor diligence and the reactions of subordinates to the PE meeting, variables that, according to McClendon et al. (2020), previous studies have considered related to PEs were included to compare alternative models that would provide clarity in understanding this influence. The research model representing the relationships between these variables is shown in Figure 1.

Figure 1. Investigation Model



Source: Own elaboration.

Therefore, the research questions to be answered was: Is there a relationship between the factors of performance evaluation and employees' intention to improve? The hypothesis proposing the tentative answer was formulated as follows:

H1: The factors of performance evaluation explain employees' intention to improve.

3. Methodology

The studied population consisted of employees from automotive manufacturing companies in the city of Aguascalientes. Both the unit of analysis and the key informant were the employees who had undergone a performance evaluation process.

Data were collected through 274 questionnaires, with 224 valid responses obtained, representing 81.75%. The items used to measure the variables related to performance evaluation (Table 1) were adopted and adapted from McClendon et al. (2020) and consisted of 5-point Likert scales where 1 = Strongly Disagree and 5 = Strongly Agree.

Demographic variables included gender, age, education level, type of employment, hierarchical level, tenure in the position, and tenure in the company. The possible values for type of employment were None, Trust Employee, and Union Employee, while the

values for hierarchical job levels were: Executive, Middle Management, Supervision, Professional and/or Technical, and Operational and/or Support. The possible values for education level were: None, Primary School, Secondary School, Higher Technical, High School, Bachelor's Degree, Master's Degree, and Doctorate.

The possible values for the type of contract were: None, Trusted employee and Unionized employee, while the values for the hierarchical levels of the jobs were: Manager, Middle management, Supervisory, professional and/or technical and Operational and/or support position.

Table 1. Indicators of performance evaluation factors

Intention to improve
I put more effort into my work as a result of the goals and objectives of the performance evaluation system.
My most recent performance review motivated me to improve my performance at work.
I have grown and developed my skills in the company as a result of the performance evaluation system.
The performance evaluation system has increased my chances of getting a promotion in the company.
Supervisor diligence
My supervisor puts a lot of effort into completing my performance evaluation.
My supervisor takes the performance evaluation very seriously.
My supervisor spends a lot of time ensuring the completion of the performance evaluation.
My supervisor makes sure to provide me with a lot of feedback during the completion of the performance evaluation.
During the evaluation period, my supervisor makes sure I know how I am meeting the objectives.
Reactions to the PE evaluation
My most recent feedback meeting on the performance evaluation increased my understanding of my job.
I believe the performance evaluation feedback meeting helped me learn how to do a better job.
My most recent feedback meeting on the performance evaluation gave me a good idea of how well I am performing and what I need to improve.
I was satisfied with the feedback meeting from the evaluation.
I felt that the performance evaluation feedback meeting was fair.
My most recent performance evaluation feedback meeting with my supervisor improved our relationship.
Procedural justice
The supervisor considered the important aspects of my work when evaluating me.
The supervisor evaluated me based on how well I did my job, not according to their personal opinion of me.
The supervisor treated me with respect and courtesy when providing my performance evaluation results.
The supervisor who evaluated me showed concern for my rights as an employee.
Overall, the supervisor who assessed my performance was fair.
Individualized consideration
My supervisor takes time to teach and train me.
My supervisor treats me as an individual, not just as a member of the group.
My supervisor takes my different needs, aspirations, and skills into account.
My supervisor helps me develop my strengths.
PE accuracy
Compared to others, I am evaluated accurately in my performance evaluation.
Overall, my performance has been evaluated accurately.
I consider my most recent performance evaluation to be accurate.
My performance evaluation score reflects my true performance.
PE Satisfaction
Overall, I am satisfied with the performance evaluation used to assess my performance.
Based on my contribution to the company, I am satisfied with my performance evaluation.
Considering my skills and the effort I put into my work, I am satisfied with my performance evaluation.

Source: Adapated from McClendon et al. (2020).

4. Results and discussion

The reliability of the item groups used to measure the variables was assessed through Cronbach's alpha coefficients. The results ranged from 0.819 to 0.952, indicating high internal consistency of the scales. Therefore, no items were removed (see Table 2).

Regarding demographic variables, 49.6% of respondents identified as female and 50.4% as male. A total of 42.4% were between 26 and 35 years old, and 23.2% were between 36 and 45 years old. Concerning employment type, 68% had a contract as trusted personnel, 18.3% were unionized, and 13.8% did not have any type of contract. As for educational attainment, 67% held a bachelor's degree, 20% a master's degree, 7% had completed high school, 2% held a doctorate, 2% a technical degree, and 2% had completed secondary education.

The respondents were primarily administrative employees (54%), while 23% held middle-management positions, 16% were in operational roles, and 7% held executive-level positions. Regarding job tenure, 20% had been in their position for less than six months, 15% between six months and one year, 43% between one and four years, 13% between five and nine years, 6% between ten and fourteen years, and 3% between fifteen and nineteen years.

The means, standard deviations, and correlations among the variables are presented in Table 2. Given that the variables were measured using a five-point Likert scale, the intention to improve showed a low mean of 2.176, as did all variables related to the supervisor's performance, with only slight variations among them.

Among the demographic variables and those related to supervisor performance, consistent and statistically significant negative correlations were found at the 0.01 level between age and all performance evaluation variables. Though weak, these correlations ranged from -0.077 to -0.285 ($p < 0.05$), suggesting that younger employees in the sample had a lower perception of supervisor performance and a lower intention to improve. Additionally, weak inverse relationships were observed between job tenure (both in the current position and in the organization) and three variables related to supervisor performance (accuracy of the performance evaluation, satisfaction with the evaluation, and reactions to the evaluation meeting), as well as with the intention to improve.

Table 2. Descriptive Statistics, Correlations, and Cronbanch's Alpha Coefficients

No.	Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Gender	1.50	.501																
2	Age	2.29	.985	.012															
3	Education Level	6.06	.799	.051	.360**														
4	Employment Type	1.96	.566	-.001	.353**	-.014													
5	Hierarchical Level	2.79	.797	-.047	-.125	-.100	.237**												
6	Job Tenure	3.26	1.747	-.009	.721**	.336**	.365**	-.108											
7	Organizational Tenure	3.51	1.961	.002	.657**	.296**	.339**	-.168*	.919**										
8	Individual Consideration	2.411	1.134	.085	-.156*	-.009	-.044	.041	-.038	-.012	0.939								
9	Relationship	2.162	1.014	.038	-.196**	-.053	-.018	-.052	-.048	-.018	.765**	0.915							
10	Support	2.174	1.074	.083	-.205**	.001	-.064	-.073	-.035	.008	.809**	.891**	0.921						
11	Procedural Justice	2.209	.973	.002	-.194**	.000	-.035	.107	-.101	-.099	.785**	.753**	.785**	0.923					
12	Accuracy of PE	2.486	1.047	.044	-.285**	-.001	-.171*	.017	-.184**	-.154*	.839**	.685**	.750**	.800**	0.932				
13	Satisfaction with PE	2.567	1.172	.043	-.259**	.016	-.225**	-.052	-.199**	-.163*	.769**	.647**	.682**	.731**	.894**	0.920			
14	Supervisor Diligence	2.436	1.115	.094	-.230**	-.029	-.051	-.003	-.125	-.093	.736**	.745**	.815**	.784**	.761**	.720**	0.952		
15	Reactions to PE Meeting	2.360	.9948	.060	-.245**	-.073	-.148*	-.025	-.211**	-.182**	.708**	.648**	.693**	.777**	.739**	.768**	.837**	0.938	
16	Intention to Improve	2.176	.875	.113	-.177**	-.049	.025	.007	-.205**	-.186**	.405**	.406**	.386**	.412**	.448**	.550**	.619**	.666**	0.819

Source: Own elaboration.

Moreover, the correlations among the variables related to supervisor execution (listed as items 8 to 15 in Table 2) were statistically significant at the 0.01 level and ranged from moderately high to high values (between 0.647 and 0.894). No multicollinearity issues were detected in the regression analyses.

The independent variable set was denoted as $X_1, X_2, \ldots, X_8$, and the dependent variable––intention to improve––was denoted as Y. A linear regression model was proposed as follows: $Y = \beta_0 + \beta_1 X_1 + \cdots + \beta_8 X_8 + \varepsilon$, Where: $\beta_0, \beta_1, \ldots, \beta_8$ are the model parameters, and ε is a random error term normally distributed with a mean of zero and variance $\sigma^2 > 0$.

To test the hypothesis, n =224 independent observations were analyzed using five hierarchical multiple regression analyses. Variables were entered in blocks, based on theoretical assumptions about their influence on the dependent variable (Intention to Improve). These blocks, listed in the first column of Table 3, were structured as follows:

First Block: Includes the seven demographic variables––gender, age, education level, employment type, hierarchical level, job tenure, and organizational tenure.

Second Block: Includes the variables, relationship, and support.

Third Block: Includes the individual consideration, procedural justice, accuracy of the performance evaluation, and satisfaction with the performance evaluation.

Fourth Block: Includes the supervisor diligence and reactions to the performance evauation meeting.

Thus, regression models A, B, C, and D included 9, 11, 13, and 15 independent variables, respectively. According to McClendon, Blocks 2, 3, and 4 are composed of variables previously shown to be significantly related to performance evaluations in earlier studies.

Table 3. Durbin-Watson Coefficients

Model	R	R squared	Durbin-Watson
Model A	.477[b]	.227	1.685
Model B	.731[c]	.535	1.625
Model C	.617[c]	.381	1.520
Model D	.756[f]	.571	1.586
Model E	.675[a]	.456	1.716

Residual analysis confirmed that the assumptions of linear regression were met, including linearity, homoscedasticity, independence, and normality of residuals. These were visually assessed through scatterplots in Figure 2, with each row corresponding to a different model.

The scatter plots in the first column show the linearity of the relationship between the predicted and observed values of the regression models A, B, C, D, and E. In the second column, the absence of patterns in the scatter plots of standardized residuals against predicted values indicates the homoscedasticity of the residuals. In the third column, the absence of patterns in the scatter plot between the row number and the residuals reflects their independence, which is confirmed by the Durbin-Watson coefficients, as they fall between 1.5 and 2.5. The normal distribution fit is shown in the scatter plots by the proximity of the points to the reference line in the cumulative probability and observed probability graphs, and is confirmed by the results of the Kolmogorov-Smirnov test (Table 4), whose significance levels are greater than 0.05.

The results (Table 5) show that the significance indices, statistical power (p), and effect size (f2) for all models are adequate. Due to the statistical criteria of the regression method used, in Models C and D, the variables individualized consideration and procedural justice were excluded, which could indicate that the variance in improvement intention that can be explained had already been accounted for by another variable within the model.

Figure 2. Assumption graphs for the regression models.

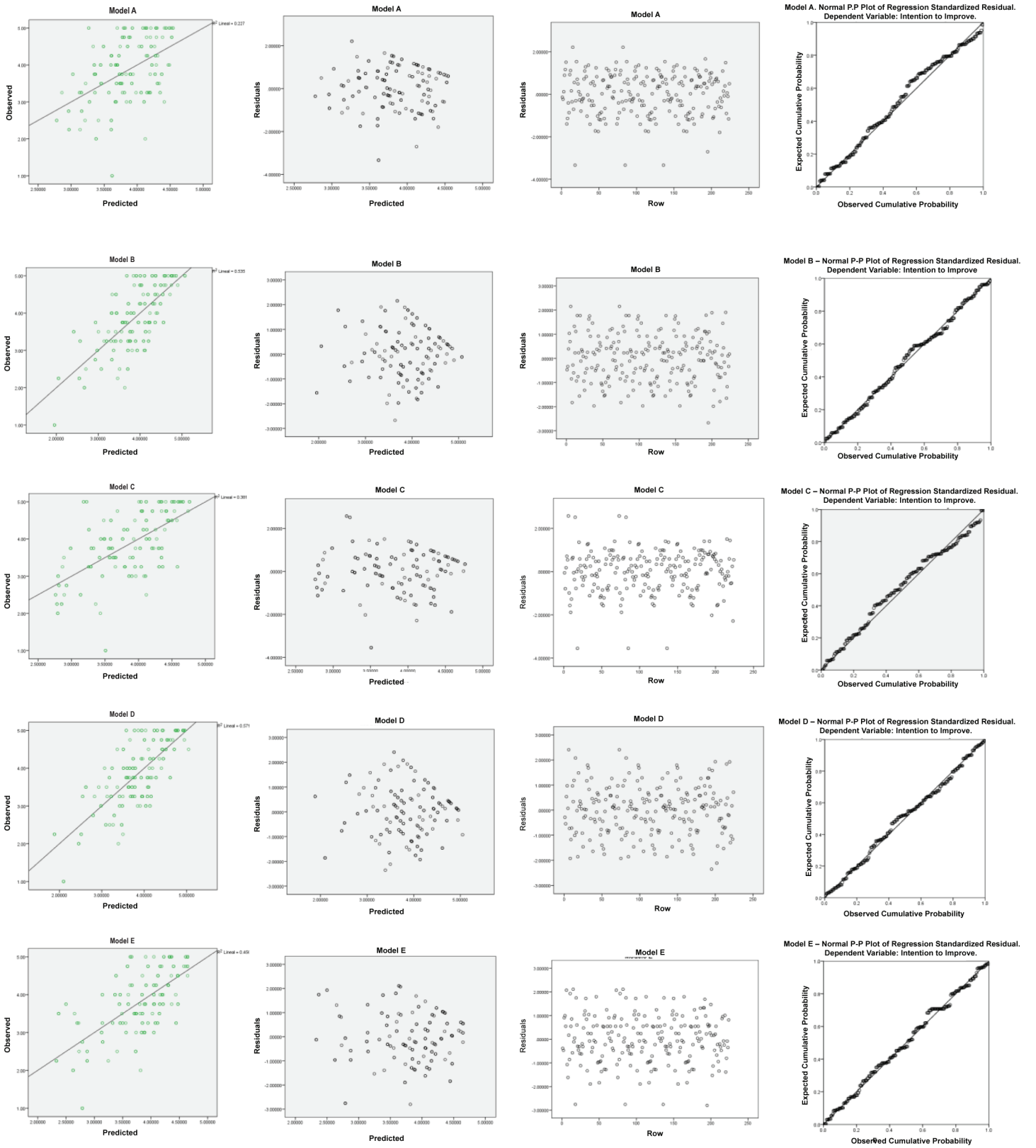


Table 4. Kolmogorov-Smirnov Test Results

	Model A Residuals	Model B Residuals	Model C Residuals	Model D Residuals	Model E Residuals
N	224	224	224	224	224
Z de Kolmogorov-Smirnov	1.263	.834	1.106	.794	.910
Sig. asintót. (two-tailed)	.082	.489	.173	.554	.380

Table 5. Multiple linear regression models

Variable Blocks	Variables	Model A β	Model B β	Model C β	Model D β	Model E β
First variable block	Gender	.086	.069	.089	.068	
	Age	.043	-.009	.015	-.023	
	Education Level	.038	.048	.001	.035	
	Type of contract	.132	.154**	.213***	.175***	
	Hierarchical Level	-.022	-.051	-.014	-.027	
	Time in position	-.205	-.101	-.112	-.072	
	Time in company	-.082	-.019	-.089	-.042	
Second variable block	Relationship	.281*	.173	141	.121	
	Support	.138	-.498***	-.022	-.417***	
Third variable block	Individualized consideration			Excluded	Excluded	
	Procedural justice			Excluded	Excluded	
	ED accuracy			-.307*	-.406***	
	ED satisfaction			.759***	.460***	
Fourth variable block	Supervisor diligence		.452***		.492***	0.208*
	ED meeting reactions		.513***		.406***	0.492***
	F	7.002	22.173	11.839	21.483	92.560
	(df regression, residual)	(9,214)	(11,212)	(11,212)	(13,210)	(2,221)
	R^2	.227	.535	.381	.571	.456
	p (model)	.001	.001	.001	.001	.001
	Effect size f^2	0.294	1.151	0.616	1.331	.838
	Statistical power (1- β)	.999	1.000	1.000	1.000	1.000

Note: Standardized regression coefficients, n = 224, *Significance level .05, **Significance level .01, ***Significance level .001.

Model D shows that the variables ED meeting reactions and supervisor diligence alone explain 45.6% of the variance in improvement intention. It can also be observed that statistical power (1-β) remains above 0.80, while the effect size (f2) varies from model to model, but is always greater than 0.35—two values conventionally considered high.

Some noteworthy findings appear in the significant—albeit low—coefficient for type of contract in Models B, C, and D, as well as in the negative coefficients of the variables support and performance evaluation accuracy in Models B and D.

Among the most relevant results, it can be seen that Models A and C—which exclude the fourth block of variables (the main variables of this study)—explain the least variance in improvement intention. Moreover, it is noteworthy that Model E, which includes only the fourth block, explains 0.456 of the variance.

This result is partially consistent with McClendon et al. (2020), who concluded that supervisor support, supervisor-subordinate relationship, and supervisor diligence are the most important performance evaluation factors in determining the existence of a positive relationship with improvement

intention among subordinates in organizations. The results of this study only coincide in identifying the importance of supervisor diligence in achieving employee improvement intention.

5. Conclusions and business implications

Both job performance and the processes through which it is evaluated are closely related to organizational processes and outcomes such as process and product quality, customer satisfaction, employee retention, productivity, and workload determination, among others. At the individual level, it influences variables such as salaries, promotions, motivation, and organizational commitment, to name a few.

Performance evaluation is not just about highlighting achievements and strengths in specific tasks but about seeking a vision that balances and aligns the interests of organizations with those of employees. This underscores the importance of generating knowledge about performance evaluation systems and how they are implemented, in order to provide a foundation for organizational development and growth planning.

The success of a performance evaluation system depends on factors related to its design, communication, and objectivity. Assessing the relative importance of specific aspects, such as those highlighted in this study—supervisor diligence and subordinate reactions to performance evaluation meetings—can help organizations focus on the elements that yield the greatest benefits.

The results of this study confirmed the existence of a positive relationship between supervisor performance during the evaluation process and employee willingness to improve. This highlights the need for manufacturing companies in the city of Aguascalientes to intensify efforts to persuade supervisors of the substantial benefits of conducting this process more effectively.

The importance of the supervisor's role is crucial to the success of performance evaluation systems, as their effectiveness could be compromised if supervisors do not approach the process seriously or neglect meaningful feedback that informs and guides employees on how to meet job objectives. Since organizations continue using performance evaluation systems with the expectation of improving employee performance, it is relevant to contribute to increasing awareness of the supervisor's role in this process.

References

Aguinis, H., Gottfredson, R. K., & Joo, H. (2012). Delivering effective performance feedback: The strengths-based approach. Business Horizons, 55(2), 105–111. Recuperado de https://doi.org/10.1016/j.bushor.2011.10.004

Ajzen, I. (1991). La teoría del comportamiento planificado. Comportamiento Organizacional y Humanidad. Procesos de decisión, 181. Recuperado de https://es.scribd.com/document/525474575/La-Teoria-Del-Comportamiento-Planificado-Icek-Ajzen

Ali, M., Usman, M., Pham, N. T., Agyemang-Mintah, P. & Akhtar, N. (2020). Being ignored at work: Understanding how and when spiritual leadership curbs workplace ostracism in the hospitality industry. International Journal of Hospitality Management, 91, 102696. Recuperado de https://doi.org/10.1016/j.ijhm.2020.102696

Biron, M., Farndale, E., & Paauwe, J. (2011). Performance management effectiveness: Lessons from world-leading firms. International Journal of Human Resource Management, 22(6), 1294–1311. Recuperado de https://doi.org/10.1080/09585 192.2011.559100

Cappelli, P. & Conyon, M. J. (2018). What Do Performance Appraisals Do? ILR Review, 71(1), 88–116. Recuperado de https://doi.org/10.1177/0019793917698649

Chiavenato, I. (2017). Administración de recursos humanos: el capital humano de las organizaciones. Santafé de Bogotá: McGraW-Hill Education.

Culbertson, S. S., Henning, J. B., & Payne, S. C. (2013). Performance appraisal satisfaction: The role of feedback and goal orientation. Journal of Personnel Psychology, 12(4), 189–195. Recuperado de https://doi.org/10.1027/1866-5888/a000096

DeNisi, A. S. & Kluger, A. N. (2000). Feedback effectiveness: Can 360-degree appraisals be improved? Academy of Management Executive, 14(1), 129—139. Recuperado de https://doi.org/10.5465/ame.2000.2909845

Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, I. L. y Rhoades, L. (2002). Perceived supervisor support: Contributions to perceived organizational support and employee retention. Journal of Applied Psychology, 87(3), 565-573. Recuperado de https://doi.org/10.1037/0021-9010.87.3.565

Gollwitzer, P. M., & Sheeran, P. (2006). Implementation Intentions And Goal Achievement: A Meta-Analysis of Effects and Process. Advanves in Esperimental Social Psychology, 38, 69–119. Recuperado de https://doi.org/10.1016/S0065-2601 (06)38002-1

Konovsky, M. A. (2000). Understanding procedural justice and its impact on business organizations. Journal of Management, 26(3). Recuperado de https://doi.org/10.1016/S0149-2063(00)00042-8

McClendon, J. A., Deckop, J. R., Han, S., & Petrucci, T. (2020). A study of system execution of performance appraisal. International Journal of Selection and Assessment, 28(3), 322–336. Recuperado de https://doi.org/10.1111/ijsa.12289

Nair, M.S. & Salleh, R. (2015). Linking Performance Appraisal Justice, Trust, and Employee Engagement: A Conceptual Framework. Procedia - Social and Behavioral Sciences 211 (2015). 1155 – 1162 (Nov. 2015), 4-6. Recuperado de https://doi.org/10.1016j.sbspro.2015.11.154

Pichler, S., Varma, A., Michel, J. S., Levy, P. E., Budhwar, P. S., & Sharma, A. (2016). Leader-Member Exchange, Group- and Individual-Level Procedural Justice and Reactions to Performance Appraisals. Human Resource Management, 55(5), 871–883. Recuperado de https://doi.org/10.1002/hrm.21724

Pulakos, E. D., Mueller-Hanson, R., & Arad, S. (2019). The Evolution of Performance Management: Searching for Value. Annual Review of Organizational Psychology and Organizational Behavior, 6(June 2018), 249–271. Recuperado de https://doi.org/10.1146/annurev-orgpsych-012218-015009

Robbins, S. (1998). La administración en el mundo de hoy. México: Prentice Hall Hispanoamericana, S.A., p. 170

Rotundo, M., & Sackett, P. R. (2002). The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: A policy-capturing approach. Journal of Applied Psychology, 87,66–80. Rynes, Recuperado de https://doi.org/10.1037/0021-9010.87.1.66

Smith, B. N., Hornsby, J. S., & Shirmeyer, R. (1996). Current trends in performance appraisal: An examination of managerial practice. SAM Advanced Management Journal, 61,10–15.

Schleicher, D. J., Baumann, H. M., Sullivan, D. W., Levy, P. M., Hargrove, D. C., & Barros-Rivera, B. A. (2018). Putting the system into performance management systems: A review and agenda for performance management research. Journal of Management, 44(6), 2209–2245. Recuperado de https://doi.org/10.1177/01492 06318 755303

Uziel, L., Price, M., & Alquist, J. L. (2022). Desire for self-control and task performance: A plan is a key. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.1011559

Weinert, B. (1987), Manual de Psicología de la Organización. Barcelona: Herder

Whetten, D. & Cameron, K. (2005), Desarrollo de Habilidades Directivas. México: Pearson Educación.

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Educational Mismatch and Performance of Workers with Higher Education in Mexico: A Gender-Differentiated Study

Rendimiento y desajuste educativo de los trabajadores con educación superior en México. Un estudio diferenciado por género

Date received: April 22, 2025

Date of approval: May 20, 2024

Angélica Beatriz Contreras Cueva[1]

[1] Professor-Researcher affiliated with the Department of Quantitative Methods at Universidad de Guadalajara, Mexico. Her research focuses on education, employment, and entrepreneurship.
Email: acontre@cucea.udg.mx. ORCID: https://orcid.org/0000-0002-3057-1272

Abstract

This study aims to analyze the relationship between educational mismatch and performance, differentiated by gender. The data for the analysis comes from the 2022 National Occupation and Employment Survey. The results were estimated using frequency statistics, Mincer's earnings equation, and the quantile regression model. Among the main findings, it is highlighted that educational mismatch affects 50% of workers with higher education, performance is better in jobs aligned with their training, and the wage gap persists both within educational levels and in jobs that match their educational background.

Keywords: Education analysis, wage gap, educational mismatch, academic performance.

JEL Codes: J3, J7, I21

Resumen

Este estudio tiene como objetivo analizar la relación entre el desajuste y el rendimiento educativo diferenciado por género. Los datos para el análisis proceden de la Encuesta Nacional de Ocupación y Empleo 2022. Los resultados se estimaron con estadísticas de frecuencia, la ecuación de ingresos de Mincer y el modelo de regresión cuántilica. De los principales resultados se destaca que el desajuste educativo afecta al 50% de los trabajadores con educación superior, el rendimiento es mejor en empleos ajustados a la formación y la brecha salarial persiste tanto dentro del nivel de estudios como en los trabajos ajustados a su formación educativa.

Palabras clave: Análisis de la educación; diferencia salarial, desajuste educativo, Rendimiento académico.

Códigos JEL: J3, J7, I21

1. Introduction

The importance of studying performance and educational mismatch contributes to understanding the conditions of the country's human capital. This knowledge is useful for building a fairer society with better and more equitable opportunities for the potential development of workers.

The well-established human capital theory, proposed by Becker (1994) and Mincer (1974), argues that higher levels of education lead to higher incomes. It would be expected that the impact of education on productivity would help reduce inequality in both employment and wages. This would be the case if the labor market offered jobs consistent with the qualifications of the workforce. However, in practice, the complexity of work

environments and the diverse characteristics of worker––beyond their educational backgrounds––result in significant variations in employment conditions. Therefore, analyzing the type of work performed and measuring its alignment with the educational and training levels attained would provide deeper insights into academic performance.

The objective of this study is to analyze educational mismatch by gender and the returns to education among workers with higher education. Human capital theory states that income increases as the level of education rises. Based on this premise, we assume that income inequality decreases for university-educated workers. However, it is necessary to examine whether this potential reduction is due to an education mismatch within educational levels rather than inequality between different education levels. To achieve this objective, our analysis is based on the approaches of Budría and Moro (2006) and Rahona et al. (2013).

This study utilizes data from the second quarter of 2022 from the National Occupation and Employment Survey (ENOE). The dataset includes individuals who reported having higher education, being employed and earning and income. To estimate educational mismatch, we calculated the frequency of workers by occupation and the years of schooling required their positions. To measure the returns to education––considering access to full income distribution––we applied ordinary least squares (OLS) and quantile regression methos, separately for men and women.

The results indicate that, among workers with higher education, educational mismatch––specifically overeducation––affects approximately 50% of workers. Regarding academic performance, workers in occupations aligned with their educational level tend to achieve higher returns. Ultimately, in terms of income, workers employed in well-paying jobs––regardless of whether their education matches their position––still benefit from returns to education. However, when analyzing within educational levels, we find that wage disparities persist, regardless of gender or job-education alignment.

The study is structured as follows: it begins with the theoretical framework, followed by the methodological design, results, discussion, and concludes with final remarks.

2. Theoretical Framework

The term returns to education refers to the impact of an additional year of education on a worker's income. Mincer (1974) empirically demonstrated the human capital theory proposed by Becker. (1994), considering education as an investment. He developed the earnings equation, also known as Mincer's equation, which allows for the estimation of educational returns in terms of wages. Human capital theory supports studies on educational mismatch, as it considers both worker productivity and wages. Furthermore, worker's skills and qualifications may not always align with labor market demands. This inconsistency is supported by the skills mismatch theory developed by Jorgenson (1967), which argues that educational mismatch can lead to inefficient resource allocation, negatively affecting economic growth and productivity. Another theoretical approach is Thurow's (1975) job competition model, where workers compete for jobs, and education plays a crucial role as an indicator of worker capability. This model suggests that overeducation can become a permanent phenomenon. In a later study, Thurow (1981) stated that educational inequality is more pronounced in societies where access to education is determined by socioeconomic status. Individuals with greater financial and cultural resources are more likely to access high-quality education, which increases their chances of securing well-paid jobs.

In the labor market, educational mismatch is defined as the difference between the level of education attained by a worker and the level required for their job. Duncan and Hoffman (1981) categorized educational mismatch into three types: overeducated, undereducated, and well-matched workers. Similarly, Gontero and Novella (2021) considered mismatch from two perspectives: vertical and horizontal. The vertical mismatch refers to workers having a higher or lower level of education than required for their job, while the horizontal mismatch applies to university graduates working in occupation unrelated to their field of study.

The literatura presents various studies on educational mismatch. For instance, Moreno and Valenzuela (2021) analyzed returns to education and educational mismatch based on workers' cognitive and physical skills. Using a multinomial logistic choice model, they concluded that women's

educational attainment places them in more complex occupations, with wages similar to those of men.

In another study, Valenzuela et al. (2018) examined educational mismatch in the Mexican labor market, considering intrinsic human capital heterogeneity (such as experience and skills). Their key findings indicate that overeducation is rewarded but at a lower rate than that of well-matched education.

McGuinness and Pouliakas (2017) analyzed the effects of overeducation on earnings using the Oaxaca decomposition technique to estimate wage penalties. Their findings suggest that differences in human capital and job skill requirements are significant factors in explaining wages. Overeducation mainly penalizes workers with higher education, while job characteristics and low-skill content contribute to the wage gap. These findings are consistent with Herranz and de la Iglesia (2015), who studied educational mismatch in Spain, comparing data from 2007 and 2012. Their analysis concluded that overeducation results in income penalties.

Flisi et al. (2017) argued that overeducation and overqualification are the primary causes of occupational mismatch. They pointed out that workers acquire knowledge that is not always transferred into the necessary skills for job performance.

Regarding returns to education and wage distribution in the context of educational mismatch, Rahona et al. (2013) found that returns for university-educated women are lower across the entire income distribution and that they experience greater wage penalties in case of educational mismatch.

Similarly, Budría and Moro (2006) analyzed returns to education and wage inequality using quantile regression across different population groups. Their findings suggest that for university-educated workers, inequality widens the gap between those in well-matched jobs and those in mismatched jobs, contributing to a broader income disparity.

These findings highlight the importance of analyzing whether educational alignment can help reduce labor inequality within Mexico's human capital.

3. Methodological Design

3. 1 Data and Descriptive Analysis

The data used in this study come from the National Occupation and Employment Survey (ENOE) for the second quarter of 2022. This survey is designed and conducted by the National Institute of Statistics and Geography (INEGI); an autonomous agency of the Mexican government responsible for managing national information.

The ENOE aims to provide data on the occupation and employment of the Economically Active Population (EAP). The survey includes information on the characteristics of the interviewees and the labor market, such as wages by occupation and hour, hours worked, education level, area of professional training, as well as the occupation within the job. The survey allows the disaggregation of data based on different points of interest. In this case, the analysis focuses on individuals who reported having higher education (bachelor's degree, master's degree, or doctorate), being employed, and receiving wages.

The sample size was 176,847 salaried individuals, from which those with higher education were selected. Therefore, the analysis sample include 49,175 individuals, which, when expanded, represents approximately 13.8 million people. Table 1 provides descriptive statistics for the variables, differentiated by gender.

From the descriptive statistics, we can highlight that the average age ranges from 17 to 75 years, with 53.37% of the population being male. The years of schooling for both men and women with higher education are 16, 18, and 20 years for a bachelor's degree, master's degree, and doctoral degree, respectively. It is noteworthy that men with higher education represent 25.29% of the total population, while women represent 31.63%. Regarding the degree distribution, men with a bachelor's degree represent 53.82%, with a master's degree 48.36%, and with a doctoral degree 52.25%. Hourly wages for men with higher education are 2.7% higher than those of women. Additionally, the work experience for men is higher, with an average of 16.71 years, while for women it is 14.36 years.

3.2 Wage Inequality

Wage inequality refers to the disparity in earnings between workers performing the same type of work.

Table 1. Descriptive Statistics of Variables for Salaried Individuals by Gender in Mexico

	Men	Women
Gender	53.37	46.63
Education Level		
Bachelor's Degree	53.82	46.18
Master's Degree	48.36	51.64
Doctorate	52.254	7.75
Occupation Status		
Salaried Employees	51.364	8.64
Employers	74.962	5.04
Self-employed Workers	58.424	1.58
Unpaid Workers	38.74	61.26
Occupation by Years of Education		
Officials, Directors, and Managers	59.39	40.61
Professionals	50.91	49.09
Technicians	44.435	5.57
Auxiliary Workers in Administrative Activities	39.81	60.19
Salespeople, Sale Agents, and Sales Employees	50.99	49.01
Workers in Personal Services and Surveillance	52.134	7.87
Workers in Agricultural, Livestock, Forestry, Hunting, and Fishing Activities	90.91	9.09
Artisanal, Construction, and other Trades Workers	72.84	27.16
Industrial Machinery Operators, Assemblers, Drivers, and Transport Drivers	81.481	8.52
Workers in Elementary and Support Activities	61.27	38.73
Field of Study		
Education Sciences	28.397	1.61
Teaching Education	33.55	66.45
Arts	51.04	48.96
Humanities	47.07	52.93
Social Sciences and Behavioral Studies	31.25	68.75
Information Sciences	46.7	53.3
Law and Criminology	56.94	43.06
Business and Accounting	49.56	50.44
Administration and Management	49.4	50.6
Biological and Environmental Sciences 4	8.19	51.81
Physical, Chemical, and Earth Sciences	60.22	39.78
Mathematics and Statistics	57.75	42.25
Information and Communication Technology Innovation	74.52	25.48
Information and Communication Technology Innovation	68.16	31.84
Mechanical, Electrical, Electronic, Chemical Engineering, and Related Professions	82.191	7.81
Manufacturing and Processes	64.74	35.26
Architecture and Construction	79.18	20.82
Agronomy, Horticulture, Silviculture, and Fisheries	85.28	14.72
Veterinary	75.352	4.65
Medical Sciences	56.214	3.79
Nursing	20.3	79.7
Dentistry	41.85	58.15
Therapy, Rehabilitation, and Alternative Treatments	31.06	68.94
Health-Related Disciplines	43.53	56.47
Personal Services and Sports	50.73	49.27
Transportation Services	82.691	7.31
Occupational Safety	57.14	42.86
Security Services	75.682	4.32

Source: Own elaboration based on data from ENOE 2nd quarter 2022.

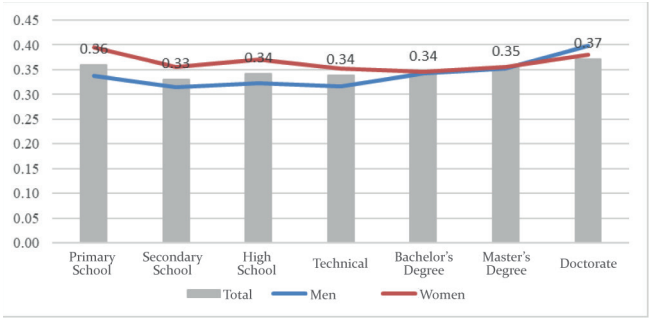
This inequality can stem from various factors such as gender, race, education, and others. It can manifest both in the wages received for similar work and in differences in total income due to occupational segregation, which is the concentration of different groups in distinct types of jobs that are remunerated differently.

According to Blanco (2014), inequality creates barriers for certain segments of society, leading to underutilization of the skills of some groups. This results in a loss of talent that could contribute to economic development.

This study aims to analyze educational mismatch by gender and the returns on education for workers with higher education, starting from the assumption that individuals' income increases as their level of education rises. This leads to the presumption that wage inequality would tend to decrease with higher educational attainment.

From Figure 1, constructed using data from the database used in this study, we observe that when differentiating by gender and education level, wage inequality increased for both men and women. However, gender inequality tended to decrease for workers with bachelor's degrees and master's degrees.

Figure 1. Income Inequality by Gender and Education Level of Workers in Mexico, 2022



Source: Own elaboration based on data from ENOE 2nd quarter 2022.

The reduction in income inequality may be attributed to inequality within the education level, rather than inequality between education levels. Below, an analysis is presented on educational mismatches for workers with higher education to determine whether the decrease in salary inequality is due to the education level.

3.3 Methodological Tools

The analysis to determine educational mismatch begins by constructing a frequency distribution from the education level variable and the occupation variable, based on the proposal by Valenzuela, Alonso, and Moreno (2018). It should be noted, as Bundría (2011) mentions, that for measuring educational match, the database should have sufficiently detailed information on education levels and occupations. The ENOE meets these two requirements.

The education level variable contains 9 levels of education; for this analysis, we select workers from the employed population who reported having a university degree.

The construction of the occupation variable is done using the variable referring to the main tasks or functions performed at work. This is presented in the database with 4 digits according to the National System of Occupation Classification (SINCO-2019). First, from the 4 digits, two variables are created: one with the first digit, forming a new variable called division, and the second with the first and second digits forming the main group variable. Then, the occupation variable is created from the nine groups of the division variable and those corresponding to 25-29 of the main group of variables. The school years are those required for the occupation, and the equivalence of education is built based on the number of years required in Mexico for each level of education. Table 2 present information regarding the school years and the education equivalencies required for each occupation.

Table 2. Required School Years and Educational Equivalencies by Occupation.

Occupation	School Years	Education Equivalency
Officials, Directors, and Managers	16	Higher Education
Professionals	16	Higher Education
Technicians	14	Technical Education
Administrative Support Workers	12	High School
Salespeople, Employees in Sales, and Sales Agents	12	High School
Personal Services and Security Workers	9	Secondary School
Agricultural, Livestock, Forestry, Hunting, and Fishing Workers	9	Secondary School
Craft Workers, Construction Workers, and other Trades	9	Secondary School
Industrial Machinery Operators, Assemblers, Drivers, and Transport Operators	9	Secondary School
Workers in Basic and Support Activities	6	Primary School

Source: Own elaboration based on data from ENOE 2nd quarter 2022

On the other hand, to estimate the returns to education, the Ordinary Least Squares (OLS) equation and the quantile regression equation, separating men and women, as proposed by Budría and Moro (2008), were used. The OLS estimation assumes that the impact of education on income is constant across the entire distribution, while quantile regression considers the effects of education on income is constant across the entire distribution, while quantile regression considers the effects of education or income at different quantiles of the distribution. By using both regression models, the impact of education on wage inequality between and within education levels can be evaluated. OLS estimates the average difference between educational levels, while quantile regression allows for the estimation of conditional income quantiles, to explain the entire distribution of income. Additionally, the quantile difference analysis identifies income differences between individuals within the same educational level.

The quantile regression model is expressed as:

$$lnIng\_x\_hrs_i = X_i\beta_\theta + e_{\theta i} \text{ with } Quant_\theta(lnIng\_x\_hrs_i|X_i) = X_i\beta_\theta$$

where X_i is the vector of exogenous variables and β_θ is the vector of parameters, $Quant_\theta(lnIng\_x\_hrs_i|X_i)$ represents the i-th quantile of the logarithm of hourly income given X. The i-th quantile of regression, is defined as a solution to the problem, o<θ<1, is defined as a solution to the problem.

From the general model of the Mincer income equation:

$$lnIng\_x\_hrs_i = \beta_0 + \beta_\theta schooling\ years_i + \beta_1 Experience + \beta_2 Experience^2 + e_i$$

Where:

$lnIng\_x\_hrs_i$ is the logarithm of hourly wage,

β_0 is the return on one year of investment in education,

schooling years is the years of schooling completed by the worker,

Experience is calculated as (age -6- schooling years),

*Experience*² (age-6-schooling years)².

The adjusted model is defined as:

$$lnIng\_x\_hrs_i = \alpha_\theta + \delta_{\theta 1} X_i + \beta_{\theta 1} educational\ level + e_{\theta i}$$

Where:

$lnIng\_x\_hrs_i$ is the logarithm of hourly wage,

X_i is a vector of explanatory variables that include those in the Mincer equation,

Educational level corresponds to the degree obtained by the worker, which can be bachelor's, master's, or doctorate,

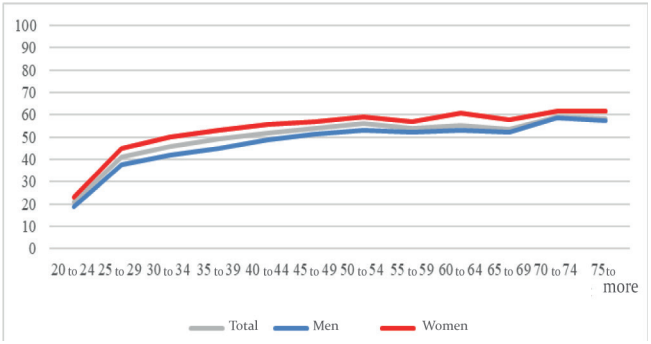
The main objective of this work is to analyze the returns to education in workers with higher education, and the possible educational mismatch, with the purpose of verifying that income inequality by gender decreases as the level of education increases, and that this decrease is due to the mismatch within the level of education rather than inequality between education levels.

4. Results

4.1 Educational Mismatch

Based on the frequencies of workers according to occupation and the years of schooling required for the position, Figure 2 shows a graph of how the jobs performed correspond to the educational level attained by workers, differentiated by age, group, and gender. It is observed that workers with higher education, the younger ones and men, have less correspondence on average than women, with percentages of 47.64% and 53.47%, respectively.

Figure 2. Educational mismatch frequencies of workers by age, group, and gender



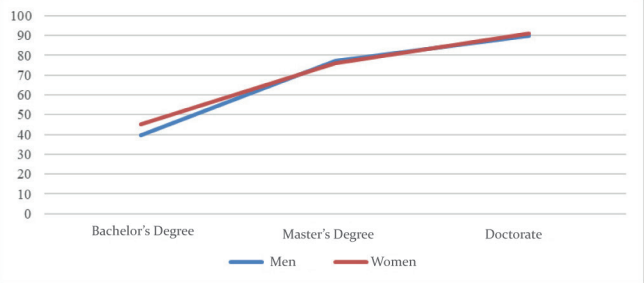
Source: Own elaboration based on ENOE 2nd quarter 2022.

This result shows that the lack of correspondence between the level of education and the job performed, which can be reflected as overeducation, also known as educational mismatch, affects

approximately 50% of workers, who hold a higher educational level than required for their job.

On the other hand, the correspondence in the position performed in relation to the academic degree, presented in Figure 3, shows that it is lower for men compared to women with bachelor's degree and doctoral degrees.

Figure 3. Educational mismatch frequencies of workers with higher education by gender.

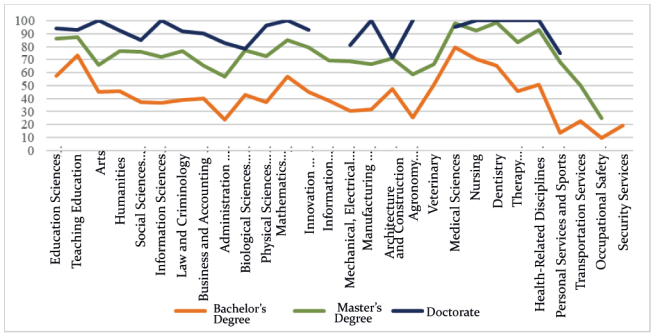


Source: Own elaboration based on data from ENOE 2nd quarter 2022.

An aspect worth delving into is the educational mismatch, differentiating by level of education and area of study. In the ENOE, the field of study is categorized into 10 broad areas, 28 specific fields, and 118 detailed fields, as described in the CMPE (2016). For this study, the 28 specific fields are used. Figure 4 presents the graphs for three levels of higher education and by area of professional training. It is clearly observed that as the level of education increases, the match improves, with averages of 42.29%, 73.60%, and 92.15% corresponding to the bachelor's degree, master's degree, and doctorate, respectively. Another point to highlight is that, for the bachelor's degree, the fields with a match greater than 75% are those in medical sciences, while the fields with the lowest match, below 25%, are those in administration and management, as well as in work security services. For the master's level, the fields with the best match are those related to health sciences, followed by education, natural sciences, mathematics and statistics, and humanities, social sciences, and law; the worst-adjusted fields are in work security.

Regarding workers with doctoral studies, the match is better in all areas, with only two fields below 75%, namely personal services and sports, and architecture and construction.

Figure 4. Frequencies of educational mismatch, by level of education and field of study.



Source: Own elaboration based on data from ENOE 2nd quarter 2022.
Note: For the doctoral level, the line presents empty spaces, since the analyzed sample did not contain information on individuals with a doctorate in certain fields of study.

4.2 Returns to Education

This section presents the results of the education return models and quantile regression models, separated by gender, while also considering the alignment of education to job positions or, in some cases, overeducation. Based on the model estimates, the analysis first examines the return on education, represented by the coefficient of years of schooling, and then evaluates the income received by workers, represented by the model constants.

Table 3 summarizes the returns to education. It shows that returns are higher for workers whose education aligns better with their job positions. The rates of return to education were 5.6% for men and 6.4% for women, demonstrating that having an education level aligned with a job position is more profitable for women. On the other hand, for men, returns are higher for those with good incomes, as shown in the 0.75 and 0.90 quantiles. However, in no case do they exceed the returns for women, whose returns increase as the quantiles rise. This means that workers in well-paid jobs obtain significantly higher returns from a university education than those in low-paid jobs. These results suggest that for workers with higher education, returns increase as they move up in the income distribution, meaning that workers in jobs well-matched to their education tend to achieve higher returns.

Table 4 summarizes the values of β_0 which correspond to the constants of the equations and represent the hourly wage values in natural logarithms when workers have zero years of experience. To determine the hourly wages with zero years of experience, the antilogarithm is applied

to the constant values. The results for the Mincer regression models indicate that these values are $20.57 and $16.88 for men, and, $17.25 and $16.72 for women, for adjusted education and overeducation, respectively. Moreover, educational mismatch penalizes women more in the lower quantiles. At quantile 0.10, the penalty for men is 27%, whereas for women, it is 33%.

To compare effects at different points in the distribution, quantile difference regression analyses were conducted for both men and women. The results show that differences between quantiles 0.75 and 0.25 are statistically significant at the 5% level. Thus, when analyzing income changes across quantiles, wages increase across the entire distribution, though only slightly in the first two quantiles. The most notable wage increase occurs from quantile 0.50 onward, especially for men. This suggests that workers whose education aligns with their job positions tend to have better wages, particularly in high-paying jobs. For women, a similar trend is observed, although wages remain lower overall.

On the other hand, for individuals working in jobs requiring lower educational qualifications than they possess, wages also show a tendency to increase within the distribution. However, the income penalty for overeducation is more pronounced in quantiles below 0.50. After this point, wages become more similar between workers in adjusted occupations and those who are overeducated.

This result suggests that workers employed in well-paying jobs, regardless of whether their education level aligns with the position, still experience returns on their education.

Table 3. Returns to Education for Workers with Higher Education by Gender, 2022

MEN	Q(.10)	Q(.25)	Q(.50)	Q(.75)	Q(.90)	OLS
Adjusted Education	0.047	0.050	0.049	0.067	0.063	0.056
Standard Error	0.003	0.000	0.001	0.010	0.012	0.005
Overeducation	0.061	0.068	0.056	0.044	0.053	0.055
Standard Error	0.007	0.005	0.000	0.007	0.008	0.003
WOMEN						
Adjusted Education	0.047	0.051	0.054	0.073	0.079	0.064
Standard Error	0.004	0.000	0.000	0.009	0.010	0.005
Overeducation	0.064	0.067	0.058	0.055	0.055	0.052
Standard Error	0.008	0.006	0.000	0.008	0.010	0.004

*All values are significant at the 5% level.
Source: Own elaboration based on Mincer regression and quantile regression outputs.

Table 4. Coefficient of Hourly Wages in Natural Logarithms by Gender in Mexico, 2022

MEN	Q(.10)	Q(.25)	Q(.50)	Q(.75)	Q(.90)	OLS
Adjusted Education	2.819321	2.861771	2.899587	3.128597	3.648395	3.023606
Standard Error	0.057	0.003	0.012	0.173	0.204	0.077
Overeducation	2.221718	2.462117	2.760303	3.179624	3.41042	2.826229
Standard Error	0.113	0.081	0.002	0.105	0.126	0.051
WOMEN						
Adjusted Education	2.766278	2.838687	2.804158	2.995934	3.260728	2.847678
Standard Error	0.070	0.001	0.003	0.150	0.171	0.076
Overeducation	2.08532	2.337173	2.727969	2.940501	3.647858	2.816538
Standard Error	0.122	2.337	0.003	0.120	0.160	0.063

*All values are significant at the 5% level.
Source: Own elaboration based on Mincer regression and quantile regression outputs.

5. Discussion and Conclusions

The main objective of this study is to analyze the returns to education and the possible educational mismatch among workers with higher education. The aim is to verify whether gender income inequality decreases as the level of education increases and whether this reduction is due more to the mismatch within the same educational level rather than to inequality between different levels of education.

To achieve this objective, the first step was to confirm that gender inequality tends to decrease as workers' level of schooling increases. It was found that for those with undergraduate and master's degrees, inequality is the same between men and women. This result supports human capital theory, confirming that education yields better returns for women. Consequently, the first hypothesis is validated, affirming that gender wage inequality decreases as workers' level of schooling increases. However, income inequality itself tends to be greater, leading to the rejection of the second hypothesis, meaning that income inequality does not decrease as the level of education rises.

Regarding educational mismatch, it was observed that among workers with higher education, younger individuals in general and men exhibit a greater mismatch than women, at 47.64% and 53.47%, respectively. These findings are consistent with those reported by Valenzuela et al. (2018). In this sense, educational mismatch, when analyzed by educational attainment, indicates that as the level of education increases, the alignment improves. However, the issue persists, as it was identified that approximately 50% of workers are overeducated, holding a higher educational level than required for their job positions. This result aligns with Duncan and Hoffman's (1981) findings, which state that more than 40% of U.S. workers reported having more education than their jobs required. Similarly, Rahona et al. (2013) found that 47% of women and 41.1% of men have an educational level that matches their job requirements, meaning that a high percentage hold positions that do not align with their qualifications.

Regarding returns to education, it was found that for workers with higher education, returns are higher as they move into higher quantiles. This means that workers whose occupations align with their education tend to achieve higher returns. This finding validates the third hypothesis, which states that educational mismatch influences income inequality. In other words, workers whose education matches their job positions tend to earn more than those in mismatched jobs. A similar trend is observed for women, although their income levels remain lower, confirming the fourth hypothesis that educational alignment influences income inequality depending on the worker's gender.

Furthermore, we found that educational mismatch leads to an income penalty in the lower quantiles, ranging from 27% for men to 33% for women. In this regard, Budría and Moro (2008) found that among university-educated workers, inequality creates a gap between those in jobs that align with their education and those in mismatched positions, further widening income inequality. McGuinness and Pouliakas (2017) add that job characteristics and the low skill content of some positions explain the wage gap. They also highlight that overeducation disproportionately penalizes workers with higher education.

Similarly, Rahona et al. (2013) argue that women generally experience greater wage penalties due to educational mismatch and that their returns to education are systematically lower. However, when analyzing university graduates, they conclude that wage discrimination appears to be less pronounced among highly qualified women.

Based on these findings, we can assert that the effects of inequality vary depending on whether job characteristics align well with the worker's educational background. When analyzing wage inequality within higher education levels, it is evident that inequality exists and depends on educational alignment and the worker's income position within the distribution. Finally, it is confirmed that income inequality decreases as education levels rise. However, when analyzed within the same level of education, inequality persists regardless of gender or job alignment.

To further explore educational mismatch, this research will continue using more robust data analysis techniques. Additionally, given that we have access to the full salary distribution, we will analyze the so-called "glass ceiling" phenomenon in the labor market. This concept refers to the existence of barriers or obstacles that prevent women from accessing leadership or executive positions (Camarena & Saavedra, 2018).

References

Becker, G. (1994). Human Capital: A theoretical and Empirical Analysis, with Special Reference to Education (3rd ed.). University of Chicago Press.

Blanco, E. (2014). La desigualdad social en el nivel medio superior de educación de la Ciudad de México. Papeles de Población, 20(80), 249-280.

Budría, S., & Moro A. (2008). Education, educational mismatch and wage inequality: Evidence for Spain. Economics of Education Review, 27, 332341.

Camarena Adame, M. E., & Saavedra García, M. L. (2018). El techo de cristal en México. La ventana. Revista de estudios de género, 5(47), 312-347. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-94362018000100312&lng=es&tlng=es

Duncan, G., & Hoffman, S. (1981). The incidence and wage effects of overeducation. Economics of Education Review, 1, 75-86. https://doi.org/10.1016/0272-7757(81)90028-5

Flisi, S., Goglio, V., Meroni, E., Rodrigues, M., & Vera Toscano, E. (2017). Medición del desajuste ocupacional: sobreeducación y exceso de habilidades en Europa: evidencia de PIAAC. Social Indicators Research, 131, 1211-1249. https://doi.org/10.1007/s11205-016-1292-7

Gontero, S., & Novella, R. (2021). El futuro del trabajo y los desajustes de habilidades en América Latina. Santiago de Chile, Comisión Económica para América Latina y el Caribe. https://repositorio.cepal.org/server/api/core/bitstreams/6f8ee77b-714f-4ad7-8100-7253082dd1d0/content

Herranz, F., & De la Iglesia, M. (2015). El desajuste educativo en España. Una comparativa entre 2007 y 2012 Chapter 29. En Investigaciones de Economía de la Educación (Vol. 10, pp. 573-596). Asociación de Economía de la Educación.

Instituto Nacional de Estadística y Geografía INEGI. (2019). Sistema Nacional de Ocupaciones. SINCO 2019. México. https://www.inegi.org.mx/app/biblioteca/ficha.html?upc=702825198411

Jorgenson, D. W. (1967). Investment, Employment, and Income Distribution in a Growing Economy. Yale University Press.

McGuinness, S., & Pouliakas, K. (2017). Deconstructing theories of overeducation in Europe: A wage decomposition approach. In S. W. Polachek et al. (Eds.), Skill Mismatch in Labor Markets (pp. 81-127). Emerald Publishing Limited.

Mincer, J. (1974). Schooling, Experience, and Earnings. New York: Columbia University Press, National Bureau of Economics.

Moreno, J., & Valenzuela, N. (2021). Asignación y Desajuste en el Mercado Laboral de México: El rol de las habilidades bajo sesgos de selección múltiple y muestras complejas. Análisis Económico, 36(93), 5–26. https://doi.org/10.24275/uam/azc/dcsh/ae/2021v36n93/Moreno

Rahona, M., Murillo, I., & Salinas, M. (2013). Rendimiento educativo y diferencial salarial por género en España. Revista del Ministerio de Empleo y Seguridad Social: Revista del Ministerio de Trabajo, Migraciones y Seguridad Social, (106), 111-126.

Thurow, L. (1975). Generating Inequality. Nueva York: Basic Books.

Thurow, L. (1981). The Zero-Sum Society. Penguin Books.

Valenzuela, N., Alonso , R., & Moreno, J. (2018). Desajuste educativo en el mercado laboral en México y su efecto en los salarios. Revista de Economía, 35(91), 65-92. https://doi.org/10.33937/reveco.2018.96

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Knowledge management based on the consumption of green products

Gestión del conocimiento basado en el consumo de productos verdes

Date received: April 24, 2024

María Cruz Lozano Ramírez[1]

Date of approval: July 10, 2024

[1] PHd in Administration, Full-Time Research Professor at the Universidad Autónoma de Baja California
Email-address: ma.cruz.lozano.ramirez@uabc.edu.mx. ORCID: http://orcid.org/0000-0002-8205-332X.

Abstract

This document presents the results of a study aimed at evaluating the perception of green product consumption. The research design was non-experimental, and the study was explanatory, applied to a non-probabilistic sample of 215 subjects. The results report a Chi-square (X2) association in 19 out of 21 variables addressing green product consumption and information structures. The study concludes that consumption is defined by information structures related to product packaging, habits, responsible purchasing, or energy savings.

Keywords: Explicit knowledge, green consumers, green products, green segments.

JEL: M3, M31

Resumen

Este documento presenta los resultados de un estudio cuyo objetivo fue evaluar la percepción del consumo de productos verdes. El diseño de investigación fue no experimental y el estudio explicativo, aplicado a una muestra no probabilística de 215 sujetos. Los resultados reportan asociación a X2 en 19 de 21 variables que abordan el consumo de productos verdes y las estructuras de información. El estudio concluye que el consumo está definido por estructuras de información relacionadas con el empaque de los productos, hábitos, compras responsables o el ahorro de energía.

Palabras clave: Conocimiento explícito, Consumidores verdes, productos verdes, segmentos verdes.

JEL: M3, M31

Introduction

Knowledge Management Based on Green Consumption

Knowledge management is a management method whose purpose is to use knowledge generated in a structured and systematic way to achieve goals and optimize decision-making, (Villasana, Hernández & Ramírez, 2021:56). As a system, it defines the steps that make knowledge a cyclical, sequenced process of facts, objectives, and events that generate information for its classification and coding to become knowledge, (Farfán & Garzón, 2006:8). As a process, knowledge management follows a systematic, logical, and organized order for its application, (Perdomo, 2023:513). This knowledge formalizes the management and use of intellectual assets, analyzes their evolution, and creates value for the organization, (Rao, 2005 cit., en Alberghini, Cricelli & Grimaldi, 2010; Abbas, Zhang, Hussain, Akram, Afaq & Afzal, 2020:2). From this, data and information are distinguished, enabling decision-making in hierarchical management structures, with information at the mid-level and data at the lower level, (Becerra & Leidne, 2008). This management underpins the acquisition of knowledge at the right time and place and promotes the use and exchange of information, (Suryani, Munadi, Idroes & Sofyan, 2020).

Knowledge resides in people, products, and processes, which fosters the development of

integrative approaches for collaboration, creation, organization, access, and use of assets , (Grant, 2007 cit., en Alberghini, et. al., 2010). Therefore, as a process of creation, revision, evaluation, and organization, information structures are created originating from business operations. Regarding green consumption, these dynamics favor access to information, highlighting its importance and benefits for market segments, whether through the website or digital tools. In these processes, background information on product use, including individual experiences and impacts, forms the information structure for companies marketing environmentally friendly products. These are communication processes aimed at defined customer segments to encourage the use of durable, renewable, recyclable, non-polluting, and environmentally friendly products. In this regard, (Tharian, 2023:13) in his study presents the characteristics associated with the "green" nature of a product, the observance of non-polluting manufacturing processes, the use of raw materials from renewable energy sources, purchased at fair prices. All of this implies the manufacture of sustainable, durable, reusable, easily recyclable products with added value, deposited in landfills or post-consumption product collection and replacement systems, as well as waste reduction. Equally important are the health and safety care of the supply chain, as well as the preservation of endangered species, consumer awareness, and sensitivity. In this direction, environmental management still faces challenges, as responsibility for environmental care and preservation requires committed participation from both businesses and society in sustainable actions. In this context, strategies are debated on environmental issues, ethical consumption, and the psychological aspects of practices addressing desires, emotions, and satisfaction levels in products and services and the transition to ecological lifestyles, supported by sustainable consumption, (Nassani, Yousaf, Grigorescu & Popa, 2023:1-3). This implies systematizing and monitoring consumer profiles, their needs, and satisfaction levels with products to manage real, reliable, and specific knowledge that supports the design of a coherent marketing mix for market segments. Of course, this information assumes the consumers' sensitivity to adopting ecological habits that preserve the environment, as it favors the integration of tools on responsible consumption and strategies for a marketing mix (price, product, place, promotion) in companies supporting sustainability. As a result of these processes, in the short or medium term, the transition to sustainable consumption habits is favored.

Green Consumption

Green Consumption, also known as: (socially responsible consumption, conscious consumption, environmentally responsible consumption, friendly consumption, and pro-environmental consumption), is defined as the use of products made from non-polluting materials during their manufacturing process, (Lian & Chen, 2024:2). These products are recyclable and aim to raise awareness, hold consumers accountable, and encourage their commitment. From this perspective, environmental degradation has altered lifestyles, productive and commercial activities, and consumption habits, redefining purchasing behavior and promoting Eco-Marketing, (Dikici, Cakrak & Demirci, 2022:191), enviromental marketing, green marketing, and sustainable marketing, (Aguilar, 2016, cit., Maldonado & Villavicencio, 2022:60). However, these definitions may be confusing because "green" implies conservation of natural resources, while "consumption" suggests some form of "destruction", (Nguyen, Nguyen & Hoang, 2019:118; Nguyen, 2023:2,3). Considering the contributions of theorists and experts on the subject, the definition integrates essential elements that structure the pillars of sustainable actions, involving the exchange of consumer needs with minimal environmental impact and the consumption of environmentally friendly products, (Parkman & Krause, 2022:86,87).

Green Consumption is based on the preservation and protection of the environment for future generations. While consumers have transitioned towards eco-consumerism, it is important to clarify that consumerism dates back to the 1950s, as a result of overproduction after World War II, where consumers became the market and the target of advertising and marketing of new products. When production exceeded

demand, other marketing methods were created to sustain or increase demand, leading to what is known as consumerism (Tharian, 2023:11). As such, consumerism is a term with various definitions depending on the context in which it is used. For some social scientists, it is more than the satisfaction of individual needs, as brands sustain the market and create lifestyles that function as substitute identities, replacing traditional ethnic and cultural identities, (Portin, 2020:4,5). Consumerism contributes to the destruction of traditional values and ways of life, the exploitation of consumers by large companies, environmental degradation, and negative psychological effects, (Hayes, 2024). Therefore, the acquisition of goods that do not satisfy real needs, but rather display a high status, is a shared concern, (Duignan, 2023). At the same time, it is relevant to acquire products with minimal environmental impact, organic items that are easy to dispose of through recycling, biodegradable products, ethical use and post-use to reduce waste in packaging, emissions, and pollutants during production and transportation processes, and greater energy efficiency (et2c, 2020), which, when used, promote water and electricity savings, low carbon emissions, ecological disposal (recycling), and the exchange and/or donation of unused items, (Lian & Chen, 2024:2). Moreover, (Meza, 2022) points out that 76% of Mexican consumers are shifting to sustainable products because they are more aware of the environmental impact of their purchases, leading them to make decisions based on sustainable lifestyles. For example, 90% use reusable bags, and 36% avoid brands that do not contribute to the environment. However, high prices are a factor that limits the acquisition of green products. The change in sustainable habits and lifestyles has been slower due to the development of content (information) promoting preservation and environmentally friendly practices for future needs, (Luo, Zheng & Guo 2023:3; EconoSus, 2023). In this context, companies play a strategic role in marketing because in their supply chains, they must evaluate the environmental performance of their own suppliers in product manufacturing, which encourages positive commercial management (Dikici, et.al., 2022:191).

Green Consumer Behavior

Consumers support companies that adhere to ecological principles, where manufacturing operations involve environmentally friendly production techniques, reduced use and waste of resources, and an impact on sustainable preferences and choices. These actions cultivate trust and reinforce their reputation, resulting in higher purchase intentions, (Shehawy & Faisal, 2024:3,4). Green trust refers to the beliefs and expectations formed by consumers based on the competence, reliability, and goodwill of the green product and its manufacturer, so trust could originate from intuition and emotion. Therefore, trust in the product's ecological attributes motivates consumers with high information capacity to be more willing to buy, (Luo, et. al., 2023:4). Over the years, concern for environmental preservation has gained momentum in the development of policies aimed at environmental protection with sustainable development goals, as environmental impact is associated with consumption behaviors and processes used in product manufacturing. For example, previous studies identified in Hong Kong that indirect water usage related to food consumption in households is 15 times greater than direct water consumption (Sandoval & Neumann, 2023:85). This study aims to identify and evaluate the perception of green product consumption. The study will allow for an understanding of preferences for green products and optimize purchasing decisions (inventory) to create conditions that support profitability in the medium and long term. The beneficiaries will be suppliers, consumers, and society because it would create conditions to increase green consumption, improving health and physical well-being. As a methodological utility, infographics will be designed about the characteristics and attributes of products to promote consumption and purchase intention.

Methodology

The research design was non-experimental, and the study was explanatory, applied to a non-probabilistic sample of 215 subjects. The research hypothesis (Hi) was defined as: Perception of green product consumption is defined by the information provided to market segments. It was operationalized

with the variables Information Structures and Green Product Consumption and evaluated with a 21-item questionnaire with a 6-point Likert scale and response alternatives (Always, Almost always, Sometimes, Almost never, Never, I don't know about this topic) (Lozano, 2018), see Table A1 in the Appendix section. From the above, the questionnaire reports positive internal consistency (Cronbach's Alpha), see Table 1.

Table 1. *Operationalization of Variables*

Dimension	Conceptual Definition	Operational Definition	Items	Conbrach Alpha
Information Structures	Content related to the characteristics of green products and their importance in environmental preservation, (Kantar Wordlpanel, 2010; Calomarde, 2000 cit. en Haman 2013:41, Lozano, 2018:221).	La variable es The variable is assessed through a 9-item questionnaire with a 6-point Likert scale.	(P16), (P22), (P23), (P27), (P28), (P29), (P30), (P40), (P42).	0.732
Green Product Consumption	Willigness to acquire and use products made with environmentally friendly, non-polluting, recyclable materials, based on aawareness, responsibility and commitment, (Kantar Wordlpanel, 2010; Lozano, 2018: 221, Nguyen, Nguyen, Hoang, 2019:118; Nguyen, 2023:2,3; Nassani, Yousaf, Grigorescu).	The variable is assessed through a 12-item questionnaire with a 6-point Likert scale.	(P5), (P10), (P11), (P21), (P24), (P25), (P26) (P31), (P33), (P39), (P41), (P43).	0.817
		Total	21	

Source. Own elaboration.

The demographic profile of the study subjects was structured with the demographic variables: Age, Biological Gender, Marital Status, and Education, see Table 2.

Table 2. *Operationalization of the Demographic Profile Variable*

Variable	Indicator	Measurement Level
Age	Age in years	Ordinal
Biological Gender	Male Female	Nominal
Marital Status	Married, Single, Divorced, Widowed, Common-law, Other	Nominal
Education	Current career being pursued	Ordinal

Source. Own elaboration.

Results

Demographic Profile.

The frequency distribution results highlight that 69% of the subjects are women with a single status and age ranges under 20 years old, with ongoing professional education in the field of Marketing, as shown in Table 3 marked with an asterisk.

Table 3. *Demographics of Study Objects*

Gender	(N=215) / %
Male	31%
Female	69%*
Marital Status	(N=215) / %
Single	95%*
Common-law	4%
Age Range	(N=215)
Under 20 years old	156*
21 to 25 years old	48
26 ro 30 years old	9
31 years and older	2
Ongoing Professional Education	(N=215)
Marketing	86%*
Tourism	4%
Common Core	10%

Source. Own elaboration.

Non-parametric Tests

To identify possible relationships between the items of the variables Consumption of Green Products and Information Structures, the Chi-Square statistic was applied, considering (P33) Acquisition of products that protect the environment and (P40) Willingness to receive ecological information as the main item for each variable, and (P5), (P10), (P11), (P21), (P24), (P25), (P26), (P31), (P39), (P41), (P43), (P16), (P22), (P23), (P27), (P28), (P29), (P30), (P42) as secondary items. In this case, the expected frequencies (fe) were compared with the observed frequencies (fo) in the cross-tabulation to calculate the statistic (Levin & Rubin, 2004:448) using the follwing formula:

$$x^2 = \sum \frac{(fo - fe)^2}{fe}$$

The frequencies of each cell were calculated using the formula:

n_r = Total number in the row.
n_c = Total number in the column.
n = Sample size.

$$F_e = \frac{n_r - n_c}{n}$$

The results report an association to x^2 in 19 out of 21 variables. The p-value *<.005rejects (Ho) for 2 items, see table 4.*

Table 4. *Association Test*

Variables	Main item	Secondary Item	Items Associated with x^2	Items NOT Associated with x^2
Information Structures	(P40). Willingness to receive ecological information	(P16), (P22), (P23), (P27), (P28), (P29), (P30), (P42).	(P16), (P22), (P23), P29), (P30), P42).	(P27), (P28)
Green Product Consumption	(P33). Acquisition of products that protect the environment.	(P5), (P10), (P11), (P21), (P24), (P25), (P26), (P31), (P39), (P41), (P43).	(P5), (P10), (P11), (P21), (P24), P25), (P26), (P31), (P39), P41), (P43).	/
Total		21	19	2

Source. Own elaboration. .

Hyphotesis Testing.

The alternative hyphotesis (Hi) was formulated as follows: The perception of green product consumption is defined by the information provided to market segments. The results indicate that, at this moment, the information shaping green product consumption is structured around two mains axes: Environmental factors (such as product packing, responsible purchases, consumption habits, and energy savings) and Stakeholder groups (which include information and participation with environmental organizations). Furthermore, the results suggest that there is no relationship between the willingness to receive information and collaboration with eco-conscious consumer groups or green campaigns. See table 5.

Information structures for green consumers

The results reject Ho, as the value < 0.005 indicates an association with χ^2 in 6 out of 8 variables. This suggests that information structures for consumers create a willingness to receive ecological information about product packaging (P16), which contributes to modifying sustainable consumption habits (P22, P30), esponsible purchasing practices for the environment.

Table 5. *Chi-Square Test Results for the Variable: Green Product Consumption*

(P33). Acquisition of products that protect the environment	Value	*df*	Asymptotic Sig.	Association with X^2
Axis 1: Willingness to Pay for Green Products				
(P39). Willingness to pay a premium for green products.	117.505[a]	30	0.000	Related
Axis 2: Green Product Consumption				
(P5). Consumption of products that consider environmental impact.	78.557[a]	25	0.000	Related
(P25). Consumption of recycled products.	78.823[a]	30	0.000	Related
(P26). Purchase of disposable products.	147.805[a]	25	0.000	Related
Axis 3: Product Acquisition				
(P10). Purchase of organic products.	81.797[a]	20	0.000	Related
(P21). Purchase of products with a green label	206.728[a]	25	0.000	Related
(P24). Adquisición de productos desechables	48.258[a]	20	0.000	Related
Axis 4: Consumers Actions				
(P11).Recommendations regarding the consumption of organic products.	86.489[a]	25	0.000	Related
(P31). Responsible purchasing decisions (considering origin and end-of-life of products)	120.076[a]	25	0.000	Related
(P41). Contributions to green products as solutions to environmental issues.	102.400[a]	30	0.000	Related

Source. Own elaboration.

(P23), promotes energy savings (P29), and fosters participation in environmental groups (see Table 6).

Table 6. *Chi-Square Test Results for the Variable: Information Structures*

(P40). Willingness to receive ecological information.	Value	*df*	Asymptotic Sig.	Association with X^2
Axis 5: Environment				
(P16). Information about the environmental impact on product packaging	152.801[a]	30	0.000	Related
(P22).Modification of sustainable product consumption habits.	98.863[a]	30	0.000	Related
(P30). Promotion of consumption habits compatible with the environment.	279.265[a]	36	0.000	Related
(P23). Responsible purchasing practices for the environment.	132.799[a]	36	0.000	Related
(P29). Energy resource savings.	66.284[a]	30	0.000	Related
Axis 6: Stakeholder Groups				
(P42). Contribution to environmental groups	128.401[a]	36	0.000	Related

Source. Own elaboration.

Regarding frequency distribution, the results indicate that 76% of participants always show interest in content related to product packaging, with 42% willing to receive ecological information. Notably, most responses from the study participants were in the "Sometimes" category on the Likert scale, where they reported engaging in responsible purchasing, maintaining environmentally friendly consumption habits, and participating in ecological groups (see Figure 1).

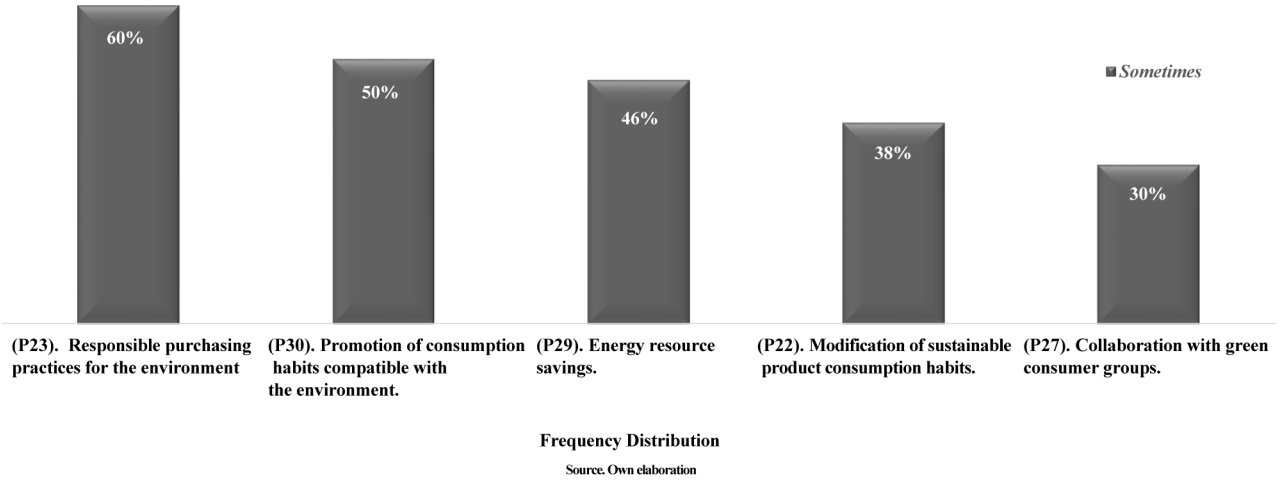
The Consumption of Green Products

Green consumers adopt behaviors that improve society and the environment (Fassou, Bredillet & Dastane, 2023:2). For this variable, the results reject Ho, as the value < 0.005 indicates an association with x^2 in 12 variables (see Table 7). These results are classified into four axes:

- Axis 1. Willingness to pay for green products with higher prices, (P39, P43).
- Axis 2. Consumption of products that consider environmental impact. (P5), recycled products (P25), and products made with natural ingredients (P26).
- Axis 3. Purchase of organic products (P10), products with Green Label (P21), disposable products (P24), and products that protect the environment (P33).
- Axis 4. Consumers actions, including making recommendations regarding the consumption of organic products. (P11), being conscious of their purchases (P31) and contributing to problem-solving (P41).
- Recommendations regarding the consumption of organic products.

For the frequency analysis, the highest values obtained for each item were considered. According to the response alternatives in the questionnaire (Always, Almost always, Sometimes, Almost never, Never, Unfamiliar with the topic), in this case,

Figure 1. *Information Structures*



the highest values from the study subjects were placed in the "Sometimes" alternative. Therefore, the description of the results will be based on this alternative. The frequency distribution reports that, regarding the consumption of green products, only 65% of the subjects acquire products that protect the environment (P33), organic products (P10), products with a green seal (P21), and disposable products (P24). 67% consume of products that consider environmental iimpact (5), 63% consume products made with natural ingredients (P26), and 59% consume recycled products (P25). These actions motivate the willingness to pay a premium (P39), and 45% recommend the consumption of organic products (P11), see Table 9. For Axis 4, Consumer Actions, responsibility in purchasing involves knowing where products originate and where they end up (P31), as well as contributions to solving environmental problems (P41), see Table 9. This is consistent with the results of the study conducted by Pieters, Cascone, Rogers, Pankratz & Waelter (2023), where they found that 44% place great importance on product packaging, 41% on durability, and 19% on the availability of information about environmental impact, see Table 7.

Discussion

The results from the perception of Information Structures and Green Product Consumption, as described so far, suggest marketing efforts aimed at interest groups and active environmentalists with information strategies defined in the attributes of products, technical sheets, benefits, and sustainable actions to drive and ensure commitment to environmental care, see Table 7. In these structures, it is necessary to add decision-making criteria for purchasing seasonal products, locally sourced products, and environmental impact, as well as actions that promote food waste reduction (Ford, Gould, Danner, Bastian & Yang, 2023:5). This implies efficiency in communication and uniformity in structures, processes of reflection and observation, identification, and evaluation of the evolution of consumer segments, production, and consumption of ecological products, and their contribution to health, etc. (Das, 2023). The development of information structures generates strategic knowledge for organizations to achieve a competitive advantage in marketing green products, (Villasana, Hernández & Ramírez, 2021:54). In these strategies, organizations can monitor consumption habits and identify changes in sustainable lifestyles

Table 7. *Perception of Green Product Consumption Based on Frequency Distribution*

Questions	Always	Almost always	Some times	Almost never	Never	Unfamiliar with the topic	NC
Axis 1: Willingness to Pay for Green Products							
(P39). Willingness to pay a premium for green products.	7%	22%	51%	14%	4%	1%	1%
(P43). Willingness to pay higher prices for green products.	7%	18%	49%	15%	10%	1%	
Axis 2: Consumption off Green Products							
(P5). Consumption of products considering environmental impact.	1%	13%	67%	11%	4%	4%	0%
(P25). Consumption of recycled products.	4%	27%	59%	10%	1%	1%	1%
(P26). Consumption of products made with natural ingredients.	5%	25%	63%	6%	1%	1%	
Axis 3: Acquisition of Products							
(P10).Purchase of organic products.	1%	16%	56%	20%	7%		
(P21). Purchase of products with a green label.	1%	11%	56%	20%	5%	8%	
(P24). Purchase of products with a green label.	4%	18%	44%	32%	2%		
(P33). Aqcuisition of products that protect the environment.	4%	19%	65%	9%	2%	1%	
Axis 4: Consumers Actions							
(P11). Recommendations regarding the consumption of organic products	4%	14%	45%	22%	14%	2%	
(P31). Responsible purchasing decisions (considering origin and end-of-life of products)	6%	22%	41%	23%	7%	1%	
(P41). Contributions to green products as solutions for environmental issues.	4%	12%	45%	23%	9%	5%	1%

Source. Own elaboration.

supported by a proper market mix relevant to the needs of their segments (product, price). Based on the above, these information structures contribute to and encourage awareness, environmental sensitivity, and values in ecological consumption, (Dikici, et. al., 2022:196). Thus, business decisions about sustainable purchases should be based on the evaluation of inventories regarding fast, slow, and non-moving products, the perception of consumers with field interventions that provide information on behavior and willingness to consume green products (Li, 2020:587). This involves disseminating information that promotes the use of energy-saving, non-polluting, recyclable products, etc. In this context, previous studies document that some companies disseminate non-financial information on carbon footprints, water use, generated waste, and their social impact, as this improves public perception and image and supports knowledge management based on the needs of market niches and experiential marketing strategies. This explicit knowledge should be accessible to all consumers in the informational structure (website) of companies, as it implies the design of information strategies for green products to boost their consumption and the internal valuation of companies selling green products, because perception does not always reflect willingness to buy, and this creates a gap between environmental awareness and buying behavior (Bian, 2020:5). Based on the above, information structures would support defining consumer segments still undecided, whose responses were placed in the "Sometimes" alternative. Therefore, by adopting environmentally friendly behaviors, using organic products, clean and renewable energy, and products made by committed companies, customers could also take on environmental commitments, (Fassou, et. al., 2023:2).

Conclusion

Based on the research objective, this study concludes that, at this moment, the perception of green product consumption is assessed through willingness to pay for products (Axis 1), Consumption (Axis 2), Product Acquisition (Axis 3), Consumer Actions (Axis 4), Environment (Axis 5), and Stakeholder Groups (Axis 6), as shown in Table 9, with a significant shift towards sustainable consumption habits. However, the level of knowledge (information structures) remains a key factor, as it is very dynamic and could redefine undecided consumers through communication objectives that highlight the actions of environmental groups and the preservation of the environment in product attributes.

Therefore, it is recommended that companies implement information and consumer education actions regarding sustainable products (circularity and recycling), organic products, farm-raised products, and those without genetically modified organisms, (Pieters, et. al., 2023), as well as their origin, manufacturing processes, impact on local communities, supply chains, and commitment to sustainability. All these actions will help build consumer trust and may attract environmentally conscious buyers, thus ensuring a smoother transition to green consumption, (Dueñas, 2023). As limitations, the need to expand the sample of subjects for the next stage of the study is identified, as well as the incorporation of qualitative techniques, such as consumer stories and experiences, to gain deeper insights into their consumption habits.

References

Abbas, J. Zhang, Q., Hussain, I. Akram, S., Afaq, A. & Afzal, M. S. (2020). Sustainable Innovation in Small Medium Enterprises: The Impact of Knowledge Management on Organizational Innovation through a Mediation Analysis by Using SEM Approach. Sustainability. Vol. No. 12. No. 6. ISSN 2071-1050. DOI: https://doi.org/10.3390/su12062407

Alberghini, E., Cricelli, L. & Grimaldi, M. (2010). Implementing Knowledge Management Through IT Opportunities: Definition of a Theoretical Model Based on Tools and Processes Classification. Proceedings of the European Conference on Intellectual Capital. ISSN: 2049-0933

Becerra, F. I. & Leidne, D. (2008). *On knowledge, knowledge Management, and knowledge Management systems.* Library of Congress Cataloging-in-Publication Data. ISBN 978-0-7656-1637-1 / ISSN 1554-6152

Bian, T., (2020). A Review on Green Consumption. IOP Conference Series: Earth and Environmental Science. Vol. 615. International Conference on Green Development and Environmental Science and Technology. ISSN 1755-1315DOI 10.1088/1755-1315/615/1/01202

Das, P. (2023). *What Is A Green Product*?. Marketing Essentials. Disponible en https://www.feedough.com/green-product/

Dikici, Z. Y., Cakrak, M. & Demirci, E. (2022). Green

Consumption Values, Social Appreciation, and Purchasing Behavior. Sustainability and Climate Change. ISSN: 2692-2932 / DOI: https://doi.org/10.1089/scc.2022.0003

Duignan, B. (2023). Consumerism. Encyclopedia Britannica. Disponible en https://www.britannica.com/money/consumerism.

Dueñas, A. (2023). How sustainability is impacting consumer trends. Disponible en https://www.sevencleanseas.com/post/consumer-trends-sustainability#:~:text=Sustainable%20Consumer%20Trends&text=About%2057%25%20of%20consumes%20are,products%20that%20are%20more%20sustainable.

EconoSus. (2023). Qué es la transición ecológica, ¿es lo mismo que la transición energética?. Economía sustentable. Disponible en https://economiasustentable.com/noticias/que-es-la-transicion-ecologica-es-lo-mismo-que-la-transicion-energetica

et2c. (2020). The Rise of Green Consumerism. Plataforma e-trade2china. Disponible en https://et2c.com/the-rise-of-green-consumerism/

Farfán, B. D. Y., & Garzón, C. M. A. (2006). La gestión del conocimiento. Documento de Investigación No. 29. ISSN: 0124-8219

Fassou, H. H., Bredillet, CH. & Dastane, O. (2023). Green consumer research: Trends and way forward based on bibliometric analysis. ISSN: 2666-7843. https://doi.org/10.1016/j.clrc.2022.100089

Ford, H., Gould, J., Danner, L., Bastian, S. E. P. & Yang, Q. (2023). "I guess it's quite trendy": A qualitative insight into young meat-eaters' sustainable food consumption habits and perceptions towards current and future protein alternatives. Appetite. No. 190. ISSN 1095-8304. DOI: https://doi.org/10.1016/j.appet.2023.107025

Hamann, P. A. (2013). El marketing verde. Un compromiso de todos. Tiempo de Opinión.Pág. 37-45. Universidad ESAN. Disponible en https://www.yumpu.com/es/document/read/29746591/el-marketing-verde-un-compromiso-de-todos-esan

Hayes, A. (2024). Consumerism Explained: Definition, Economic Impact, Pros & Cons. Disponible en https://www.investopedia.com/terms/c/consumerism.asp

kantarworldpanel. (2010). 6 tipos de consumidores verdes. Disponible en https://www.merca20.com/6-tipos-de-consumidores-verdes/

Levin, I. R. & Rubin, D. S. (2004). Estadística para administración y economía. Pearson Educación. ISBN: 970-2604-974, 978-9702-6049-76

Li, M. L. (2020). Review of Consumers' Green Consumption Behavior. American Journal of Industrial and Business Management. ISSN: 2164-5175 / 2164-5167. DOI: https://doi.org/10.4236/ajibm.2020.103039

Lian, CH. & Chen, X. (2024). The influence mechanism of self-transcendence on green consumption: The chain mediating effect of construction of meaning in life and connectedness. Acta Psychologica. ISSN: 1873-6297. DOI: https://doi.org/10.1016/j.actpsy.2024.104180

Lozano, R. M. C. (2018). Gestión del conocimiento para el diseño de estructuras de información sobre Mercadotecnia Verde (MV) en segmentos de Jóvenes Consumidores. Revista El Periplo sustentable. ISSN: 1870-9036. No. 34- DOI: https://rperiplo.uaemex.mx/article/view/9069

Luo, G., Zheng, H. & Guo, Y. l. (2023). Impact of consumer information capability on green consumption intention: the role of green trust and media publicity. Frontiers in Psychology. ISSN: 1664-1078. https://doi.org/10.3389/fpsyg.2023.1247479

Maldonado, O. J. B. & Villavicencio, R. M. F. (2022). Marketing verde, una mirada desde el comercio minorista: Caso hipermercados del Ecuador. Revista Especializada en Ciencias Administrativas, Contables y Económicas. Ecuador. Vol. 13. No.1. ISSN: 2528 – 7869. https://doi.org/10.33936/eca_sinergia.v13i1.3377

Meza, R. E. (2022). 8 de cada 10 consumidores prefiere productos sustentables, pero los altos precios detienen la intención de compra. Disponible en https://www.eleconomista.com.mx/el-empresario/8-de-cada-10-consumidores-prefiere-productos-sustentables-pero-los-altos-precios-detienen-la-intencion-de-compra-20220905-0112.html

Nassani, A.A.; Yousaf, Z.; Grigorescu, A. & Popa, A. (2023). Green and Environmental Marketing Strategies and Ethical Consumption: Evidence from the Tourism Sector. ISSN: 2071-1050. DOI:https://doi.org/10.3390/su151612199

Nguyen, D.D. (2023). Evaluating the Consumer Attitude and Behavioral Consumption of Green Products in Vietnam. Sustainability. ISSN: 2071-1050. DOI: https://doi.org/10.3390/su15097612

Nguyen HV, Nguyen CH. & Hoang TTB. (2019). Green consumption: Closing the intention-behavior gap. Sustainable Development. ISSN: 099-1719. https://doi.org/10.1002/sd.1875

Parkman, I. D., & Krause, A. J. (2022). The Diamond Model of Authentic Green Marketing: Evidence from the Sustainable Architecture Industry. Business and Society Review. ISSN 2659-3270

Perdomo, R. R. (2023). Gestión del conocimiento en las organizaciones. Revista Educare. ISSN: 2244-7296 /1316-6212. Vol. 27. No. 1

Pieters, L., Cascone, Rogers, S., Pankratz, D. & Waelter,

A. (2023). Green products come of age. Expectations of sustainable products are rising, but consumers are likely to reward brands that deliver. Disponible en https://www2.deloitte.com/xe/en/insights/industry/retail-distribution/consumer-behavior-trends-state-of-the-consumer-tracker/sustainable-products-customer-expectations.html

Portin, F. (2020). Consumerism as a moral attitude, Studia Theologica - Nordic Journal of Theology. Vol. 74.No. 1. ISSN: 0039-338X / 1502-7791. DOI: https://doi.org/10.1080/0039338X.2020.1751278

Sandoval, D. J. & Neumann, L. P. (2023). Green Products Purchase Intention in Chilean Consumers: Comparing Three Models Using Structural Equations. Revista Colombiana de Psicología. Vol. 32. No. 1. ISSN: 0121-5469 / 2344-8644. DOI: https://doi.org/10.15446/rcp.v32n1.92739

Shehawy, Y. M. & Faisal, A. K. S. M. (2024). Consumer readiness for green consumption: The role of green awareness as a moderator of the relationship between green attitudes and purchase intentions. Journal of Retailing and Consumer Services. No. 78. ISSN: 0969-6989: DOI: https://doi.org/10.1016/j.jretconser.2024.103739

Suryani, O. R., Munadi, K., Idroes, R. & Sofyan, S. (2020). Knowledge management practices in disaster management: Systematic review. ISSN: 2212-4209. DOI: https://doi.org/10.1016/j.ijdrr.2020.101881

Tharian, B. (2023). A New Philosophy for sustainable consumerism. Management of Sustainable Development Journal. Vol. 15. No. 1. ISSN 2684-6802. DOI:https://doi.org/10.54989/msd-2023-0002

Villasana, A. L. M., Hernández, G. P. & Ramírez, F. E. (2021). La gestión del conocimiento, pasado, presente y futuro. Una revisión de la literatura. Trascender, Contabilidad y Gestión. No. 6, No. 18. ISSN: 2448-6388.

Table A1. *Measurement Instrument*

Age
Biological gender. Male( ) Female ( )
Maritial Status: Married( ) Single ( ) Divorced ( ) Widowed( ) Common-law ( )
Education

Question	Always	Almost always	Sometimes	Almost never	Never	Unfamiliar with the topic
(P5). Consumption of products that consider environmental impact.						
(P10). Purchase of organic products.						
(P11). Recommendations regarding the consumption of organic products..						
(P16).Information about the environmental impact on product packaging						
(P21). Purchase of products with green label.						
(P22). Modification of sustainable product consumption habits.						
(P23). Responsible purchasing practices for the environment.						
(P24).Purchase of disposable products.						
(P25). Consumption of recycled products.						
(P26). Consumption of products made with natural ingredients.						
(P27). Collaboration with eco-conscious consumer groups.						
(P28). Participation with green campaigns.						
(P29). Energy resource savings.						
(P30). Promotion of consumption habits compatible with the environment.						
(P31). Responsible purchasing decisions (considering origin and end-of-life of products)						
(P33). Acquisition of products that protect the environment						
(P39). Willingness to pay a premium for green products						

Question	Always	Almost always	Sometimes	Almost never	Never	Unfamiliar with the topic
(P40). Willingness to receive ecological information						
(P41). Contribution to green products as solutions to environmental issues						
(P43). Willingness to pay higher prices for green products.						
(P42). Contribution to environmental groups						

Table A2. *Theoretical Support of the Context*

Authors	Introduction	Method	Results	Discussion	Conclusions
Abbas, J. Zhang, Q., Hussain, I. Akram, S., Afaq, A. & Afzal, M. S. (2020).	✓				
Alberghini, E., Cricelli, L. & Grimaldi, M. (2010).	✓				
Becerra, F. I. & Leidne, D. (2008).	✓				
Bian, T., (2020).				✓	
Das, P. (2023).			✓		
Dikici, Z. Y., Cakrak, M. & Demirci, E. (2022).	✓		✓		
Duignan, B. (2023).	✓				
Dueñas, A. (2023).					✓
EconoSus. (2023).	✓				
et2c. (2020).	✓				
Farfán, B. D. Y., & Garzón, C. M. A. (2006).	✓				
Fassou, H. H., Bredillet, CH. & Dastane, O. (2023).				✓	
Ford, H., Gould, J., Danner, L., Bastian, S. E. P. & Yang, Q. (2023).			✓		
Hamann, P. A. (2013).		✓			
Hayes, A. (2024).	✓				
kantarworldpanel. (2010).		✓			
Levin, I. R. & Rubin, D. S. (2004).		✓			
Li, M. L. (2020).			✓		
Lian, CH. & Chen, X. (2024).	✓				
Lozano, R. M. C. (2018).		✓			
Luo, G., Zheng, H. & Guo, Y. l. (2023).	✓				
Maldonado, O. J. B. & Villavicencio, R. M. F. (2022).	✓				
Meza, R. E. (2022).	✓				
Nassani, A.A.; Yousaf, Z.; Grigorescu, A. & Popa, A. (2023).	✓	✓			
Nguyen, D.D. (2023).	✓				
Nguyen HV, Nguyen CH. & Hoang TTB. (2019).	✓	✓			
Parkman, I. D., & Krause, A. J. (2022).	✓				
Perdomo, R. R. (2023).	✓				
Pieters, L., Cascone, Rogers, S., Pankratz, D. & Waelter, A. (2023).	✓		✓		✓
Portin, F. (2020).	✓				
Sandoval, D. J. & Neumann, L. P. (2023).	✓				
Shehawy, Y. M. & Faisal, A. K. S. M. (2024).	✓				
Suryani, O. R., Munadi, K., Idroes, R. & Sofyan, S. (2020	✓				
Tharian, B. (2023).	✓				
Villasana, A. L. M., Hernández, G. P. & Ramírez, F. E. (2021).			✓		

Source. Own elaboration.

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Youth Labor Market Insertion: A Review for Latin America and Mexico

Inserción laboral juvenil: Una revisión para América Latina y México

Date received: June 26, 2024

Date approved: September 19, 2024

Astrid Ortiz Figueroa[1], Linda Irene Llamas Rembao[2] y Luis Huesca Reynoso[3]

[1] Master of Science in Economics from Universidad Autonoma de Baja California. Doctoral candidate in the PhD Program in Regional Development at the Center for Research in Food and Development (CIAD).
Email: aortiz422@estudiantes.ciad.mx. ORCID: https://orcid.org/0009-0001-5965-3917

[2] Doctor in Regional Development from the Center for Research in Food and Development (CIAD), Master's in Regional Development from CIAD, and Bachelor's in International Trade from Universidad Estatal de Sonora (UES). Full-time Professor at UES.
Email: linda.llamas@ues.mx. ORCID: https://orcid.org/0000-0003-3214-3738

[3] Corresponding author. PhD in Economics from Universidad Autonoma de Barcelona, Master's in Applied Economics Policy from Universidad de Sonora. Senior Researcher at the Center for Research in Food and Development (CIAD) within the CONACYT Network of Research Centers.
Email: lhuesca@ciad.mx. ORCID: https://orcid.org/0000-0002-7687-6039

Abstract

The paper has a two-fold objective: first, to discuss the social programs related to the labor insertion of youth in Latin America and Mexico, and second, to characterize the eligibility of the population of the Youth Building the Future Program in Mexico. Chile ranks first place with 26 insertion programs, followed by Argentina with 18, Uruguay with 14, and Mexico with 12, along with Colombia and Brazil with 11. There is wide evidence confirming that most programs have a positive effect on labor insertion in Latin American countries, and in the case of Mexico, the success rate is up to 60%. The results of the characterization show that eligibility for women is greater than in men as they are more impacted by this condition, and when they have children, a higher share (62.4%) is included, while eligibility for men eligible with children is impacted to a lesser extent (4.1%).

Keywords: Youth unemployment; Capabilities; Labor Insertion: Training, Social programs

JEL Codes: E24 - Employment; Unemployment; Wages and J64 - Unemployment: models, duration, incidence, and job search.

Resumen

El artículo tiene un doble objetivo, realizar una revisión sobre los programas sociales relacionados con la inserción laboral de los jóvenes de América Latina y México, y caracterizar la población elegible del Programa Jóvenes Construyendo el Futuro en México. Se encuentra que Chile se ubica en primer lugar con 26 programas de inserción, seguido por Argentina con 18, Uruguay con 14 y México con 12 junto a Colombia y Brasil con 11. Existe evidencia variada en la que se confirma que la mayoría de los programas tienen un efecto positivo en la inserción laboral en América Latina y, en el caso de México la tasa de éxito es de hasta un 60%. Los resultados de la caracterización exponen que las mujeres elegibles se ven mayormente impactadas en esta condición, y cuando tienen hijos la mayor parte de ellas (62.4%)

se ven afectadas en tanto que los hombres elegibles con hijos se ven impactados en menor medida (4.1%).

Palabras clave: Desempleo juvenil; Capacidades; Inserción laboral, Entrenamiento; Programas sociales.

Código JEL: E24 - Empleo; Desempleo; Salarios y J64 - Desempleo: modelos, duración, incidencia y búsqueda de empleo.

Introduction

Youth unemployment is a significant challenge worldwide, which worsened in 2020 due to the COVID-19 pandemic. On one hand, the closure of economic activities not only led companies to reduce labor demand but also focused on retaining their more experienced workers. On the other hand, the closure of educational institutions and the shift to distance learning had a negative impact on both the incorporation of young people into the educational system and the continuity of their studies. As a result, unemployed young people not studying in 2020 represented 23.3% of the population aged 15 to 24, an increase of 1.5 percentage points compared to 2019 (ILO, 2022).

Although rates vary by region and economic situation, youth unemployment remains a persistent problem in many countries. This situation affects the personal development of these young people, as they face significant disadvantages in the labor market due to the lack of work experience and job-related skills. Concerns about the long-term economic and social consequences have led to a greater push for social programs aimed at reducing this vulnerability, through policies promoting job creation, training, skill development, and support for young entrepreneurs.

In Latin America, before the pandemic, the region already faced significant challenges in terms of youth employment due to factors such as the lack of job opportunities, a high percentage of short-term contracts, low returns on human capital, and labor market informality (Weller, 2006; Castro & Huesca, 2007). The United Nations set a target for 2020 for nations to substantially reduce the proportion of young people who neither study, work, nor receive training, as part of Goal Eight of the 2030 Agenda for Sustainable Development (UN, 2024).

In 2020, youth unemployment worsened, as the average labor force participation rate dropped by 3.1 percentage points (pp) in the region (from 45.8% to 42.7% from 2019 to 2020), with heterogeneous impacts at the country level. According to Vezza (2021), the largest drop in the youth labor force was observed in Peru (11.4 pp), the Dominican Republic (7.1 pp), Argentina (6.8 pp), Colombia (6.2 pp), Chile (6 pp), and Brazil (5.9 pp); while Paraguay, Ecuador, and Mexico showed reductions of 5.9, 4, 3.7, and 3.2, respectively (ILO, 2022).

While global economies began to recover gradually from 2021, figures for 2022 indicate that one in four young people lacked education, employment, or training (i.e., 23.5% of young people aged 15 to 24). In Latin America and the Caribbean, one in five young people were in this situation (with a rate of 20.3%), and women faced twice the likelihood of being unemployed, not studying, or not receiving training (26.9% versus 13.9%, respectively) (UN, 2023).

Youth unemployment affects women, young people with low incomes, and those with lower levels of education to a greater extent. Therefore, in Latin America, public policies must not only promote labor market insertion, training, and skill development for this population group but also face the challenge of achieving greater labor inclusion for vulnerable groups such as women, people with disabilities, and young people from marginalized communities.

In Mexico, according to data from the National Occupation and Employment Survey, the unemployed population represented 2.9% of the economically active population in January 2024, of which 12.9% had not completed basic education (i.e., less than 9 years of schooling). Young people aged 15 to 24 represented 32.4% of the unemployed population (561,146 people), and as in the rest of the Latin American region, women faced higher unemployment rates (INEGI, 2024).

Although these figures reflect an improvement

compared to 2023, young people still face challenges for labor market insertion, especially during times of crisis. Phenomena such as the COVID-19 pandemic in 2020 and 2021 and Hurricane Otis in 2023 have impacted both labor market insertion and school retention at the national level and across federal entities.

Given the vulnerability of the youth population and the potential social repercussions of lacking education and/or work experience, this paper aims to characterize the unemployed population that is not pursuing education in Mexico and at the regional level, as well as the social programs designed to support this group. To this end, a preliminary analysis and reflection on the success of these social programs is conducted based on a review of recent national and international empirical evidence.

This introductory section is complemented by four additional sections. The second section briefly outlines the issue of youth unemployment at the global level, while the third section inventories the social programs implemented in Latin America aimed at promoting youth labor market insertion. The fourth section identifies the social programs that have existed in Mexico, particularly those targeting young people who neither study nor work, and the fifth section discusses the main characteristics of this subpopulation. Finally, conclusions and possible lines of research on the topic are presented.

The challenge of labor market integration for young people who are not in education, employment, or training (NEETs)

Undoubtedly, crises have a negative impact on the labor market, regardless of the type of economy or even geographic boundaries. Kahn's (2010) study reveals that in the United States, young people who graduate from university during periods of adverse local and national economic conditions experience negative and persistent effects on their earned wages and the quality of employment obtained. Similarly, Ghoshray, Ordóñez, and Sala (2016) show that youth unemployment in the European Union is sensitive to economic cycle fluctuations during times of crisis. They suggest strengthening policies aimed at promoting youth employment, particularly by consolidating the educational system as a tool to help restore youth employment rates.

Between 2013 and 2019, youth unemployment rates steadily declined in Canada, Germany, Ireland, and the United Kingdom. However, this trend was reversed in 2020, reaching peak levels in the summer of that year (Deng et al., 2022). In Canada, for example, the youth unemployment rate increased by 11.7 percentage points (rising from 17.1% to 28.8%) from March to May 2020.

Although youth unemployment rates largely recovered by mid-2021, they remained above 2019 levels in most OECD countries. The increase in youth unemployment rates (in percentage points) was 2.6 in Canada, 2.2 in Ireland, 1.5 in the United Kingdom, and 1.2 in Germany. The COVID-19 crisis led to an increase in long-term unemployment risks for young people, as the proportion of youth unemployed for more than 12 months rose in Canada, Germany, and the United Kingdom (Deng et al., 2022).

One strategy that supports labor market integration is vocational training, work experience, or involvement in research. In Thailand, there is concern about the transition of young people aged 15 to 29 into adulthood, as those who are not in education or employment face difficulties in obtaining a job due to a lack of negotiation skills, vulnerability to discriminatory practices, limited work experience, and weak social protection (ILO, 2022). In fact, during the second half of 2022, the youth unemployment rate in Thailand was ten times higher than that of adults, representing 1.2 million NEETs (mostly women, with a high proportion of widows) (ILO, 2022).

The International Labour Organization (ILO, 2022) states that the lack of effective policy implementation—both before and after the pandemic—has negatively affected real incomes, exacerbating inequalities among workers and their families. It is crucial for governments, businesses, and other stakeholders to work together to address youth unemployment through policies that promote job creation, training, skills development, and support for young entrepreneurs. Additionally, it is

necessary to evaluate and monitor these programs. In this regard, Yeomans et al. (2023) argue that there is a lack of research in this area and urge scholars to develop studies that evaluate labor market integration mechanisms.

Below are some programs that have been implemented in different countries to support this population group. In Spain, the National Youth Guarantee System (SNGJ) is a program that aims to provide training and job intermediation for young people who are not currently working or participating in full-time education or training. The SNGJ establishes four lines of action (training, intermediation, hiring, and entrepreneurship promotion), which are implemented simultaneously. Beneficiaries are young people aged 16 to 24 who are unemployed, as well as those aged 25 to 30 when the unemployment rate exceeds 20% (Taléns, 2017).

De la Rica, Lizárraga, and Martínez (2022) analyze the impact of the "Lehen Aukera" wage subsidy program aimed at young people in the Basque Country, Spain. The program targets individuals under 30 with less than six months of experience in any field, providing them with training and practical work experience. The authors found that acquiring work experience through the program favors labor market integration.

Between 2007 and 2014, Italy experienced a 1.2-fold increase in unemployment. The European Union mandated the implementation of the "European Youth Guarantee" policy, which offers support in employment, training, or education to young people within four months of becoming unemployed. Pastore's (2015) study reviewed the context in which the program was developed and found that the job vacancies promoted were poorly defined, and the funds allocated for education investment were very limited; as a result, participation in the program by NEETs was below 1%. The author calls for macroeconomic priorities focused on a tripartite restructuring among governments to improve coordination between policies, training, education, and labor market integration.

In Thailand, the "Young Futurmakers Thailand" project aims to increase employment at the provincial level, especially in regions with lower employment rates. Its objective is to promote employment through training in technical skills and job-seeking skills based on labor market demand. However, these efforts were unsuccessful due to limited program promotion, public uncertainty about its effectiveness, and other factors that hindered participation by the most disadvantaged (ILO, 2023). The program faces several challenges: the lack of career guidance for future work, the mismatch between education supply and labor market demand, limited collaboration in youth engagement strategies, and poor coordination between public and private employment offices in implementing effective labor market programs.

In Canada, Yeomans et al. (2023) examine the support provided to NEETs to facilitate their labor market integration and identify mentoring and tutoring as effective measures for this purpose. They also conclude that youth unemployment should be analyzed from multiple perspectives to identify other barriers to integration, such as employers' lack of flexibility toward young people who are parents.

In 2014, the U.S. Department of Labor launched a youth employment program targeting individuals aged 14 to 24 facing barriers in education, training, and employment. Local programs offer services to young people in partnership with American Job Centers under the guidance of local workforce development boards (DOL, 2024).

After reviewing the recent international context, there is a clear and sustained interest in promoting labor market integration programs focused on training and skill development. However, external factors remain major obstacles that prevent these programs from achieving their goals. In other words, the impact of economic crises and fluctuations creates structural disruptions that interrupt the normal cycle of labor integration, prompting economic agents to implement support measures to promote full employment. Barriers such as long-term unemployment or the mismatch between labor market demand and available skill profiles—especially due to new practices emerging from events like the 2020 pandemic—are among the most significant. Additionally, economic recessions that transform traditional productive factors leave young people, women, and people with

disabilities particularly vulnerable, highlighting the urgent need for adaptive strategies to support their integration into the labor market.

Social programs for labor market inclusions in Latin America

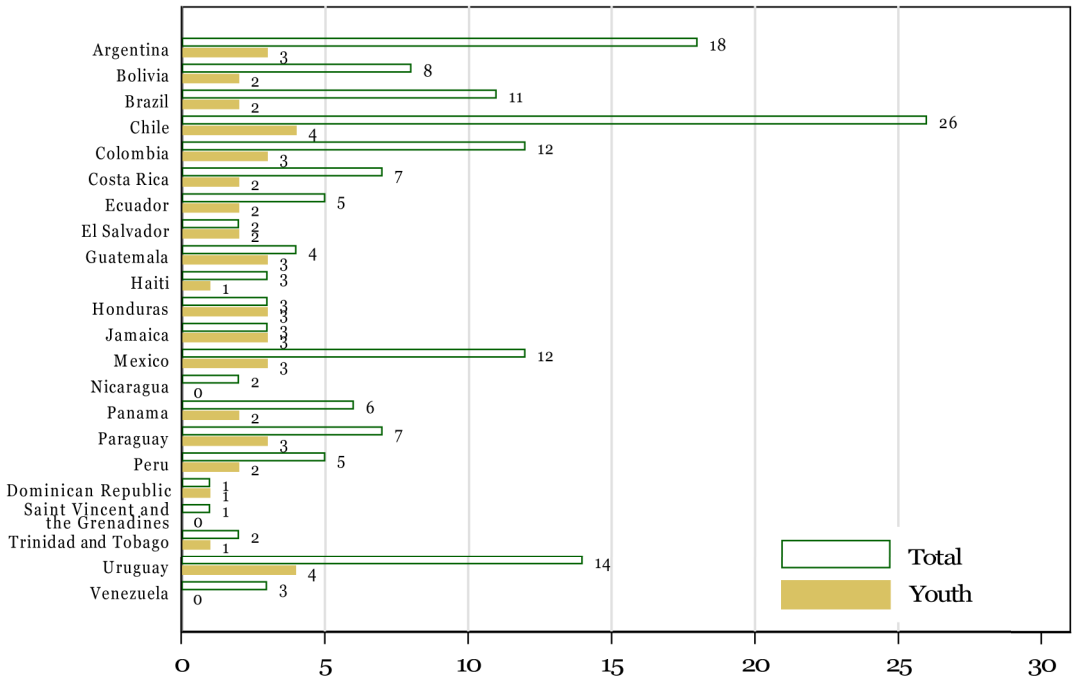
Social programs aimed at labor market inclusion can be classified into five categories according to ECLAC (2019). First, labor supply support programs, which seek to facilitate labor market insertion through the development of skills that meet labor market demands, by means of technical and vocational training, academic leveling, and school retention. Second, labor demand support programs, which provide tools to promote self-employment and job creation—either directly or indirectly. The remaining three categories correspond to labor intermediation services, youth labor inclusion programs, and the labor and productive inclusion of people with disabilities.

During the 1990s, Chile was a pioneer in promoting this type of initiative with the implementation of the Chile Joven program, which ran from 1991 to 1998 (ECLAC, 2019). By the early 2000s, other Latin American countries had also implemented labor market inclusion programs for young people. In general, the definition of the target population differs in terms of age range (although most define youth as individuals between 15 and 30 years old), and in some cases, prioritization criteria are established based on conditions of vulnerability: educational gaps, limited work experience, income below a poverty threshold, among others.

Graph 1 shows a count of social programs focused on labor market inclusion in various Latin American countries, as well as those exclusively aimed at reducing youth unemployment. It is observed that 155 social programs focused on labor market inclusion have operated in Latin America, 46 of which are focused on young people (ECLAC, 2024). Chile, Argentina, Uruguay, Colombia, and Mexico are the countries that have implemented the largest number of social programs.

Recently created programs include "Mi Primer Empleo" in Costa Rica (2015), "Jóvenes con Más y Mejor Trabajo" in Argentina (2017), "Jóvenes Construyendo el Futuro" in Mexico (2019), and "Temporary Social Security and Skills Network" in Haiti (2020) (ECLAC, 2023). Usually, the operation of these programs is delegated to the Ministries of Labor of the respective countries. The goal is to link this subpopulation group to companies

Graph 1. Number of social programs focused on labor market inclusion in Latin America.



Source: Own elaboration based on CEPAL (2024).

to promote labor market inclusion through training and/or on-the-job employment programs..

Table 1 summarizes social programs in Latin America exclusively aimed at youth. Most of these programs are currently active (34 in total), and the predominant area of support is technical and professional training for young people. On the other hand, the programs that aim for a more comprehensive strategy by including at least four types of support are: Jóvenes con Más y Mejor Trabajo (Argentina), Programa de Mejora de la Empleabilidad y los Ingresos Laborales de los Jóvenes (Bolivia), Programa Jóvenes Con Todo (El Salvador), and Programa Beca Social (Guatemala).

One of the longest-standing policies is Brazil's Jovem Aprendiz program, which implements a dual training model—in the classroom and in the workplace. The government subsidizes wages based on the participant's level of education, as long as the on-the-job training lasts at least six hours a day for up to two years. This apprenticeship contract model, supported by company subsidies, is also implemented by other programs such as Formación en el puesto de trabajo – Aprendices para jóvenes in Chile, Mi Primer Empleo in Costa Rica, Jóvenes Construyendo el Futuro in Mexico, Aprender Haciendo in Panama, Mi Primer Empleo in Ecuador, and Jóvenes in Argentina (Vezza, 2021).

Among the active programs, those targeting youth in poverty include: Mi Primer Empleo Digno (Bolivia), YoTrabajo–Jóvenes (Chile), Jóvenes en Acción (Colombia), Programa Beca Social (Guatemala), Red Temporal de Seguridad Social y Competencia (Haiti), Programa Nacional para la Empleabilidad and Trabaja Perú (Peru), and Programa Juventud y Empleo (Dominican Republic). Moreover, programs that include prioritization criteria for youth with disabilities are: Empléate and Mi Primer Empleo (Costa Rica), Jamaica Youth Employment Network (Jamaica), and Trabaja Perú (Peru).

The effectiveness of this type of program remains a topic of academic interest. For example, a study by Pontoni and Radiciotti (2010) analyzed the effectiveness of the Seguro de Capacitación y Empleo (SCyE) program as a labor reintegration strategy in Argentina. The authors found that in the presence of market failures, economic agents such as the state, employers, and employees use training and professional development as strategies to align labor supply with demand. They highlight that factors such as age, gender, selection criteria, and recruitment processes carry significant weight in hiring decisions, which hinders the reintegration of unemployed workers into the formal labor market.

Another crucial factor in youth labor market integration is the attitude of young people during their job search. Roberti's (2021) research analyzes students' interest in job placement programs in Argentina. He interviewed 40 participants from the Jóvenes con Más y Mejor Trabajo program and the Programa de Respaldo a Estudiantes Argentinos. He found that youth share the same moral value of work in relation to active employment policies, often using terms like "sacrifice," "effort," and "merit" in their narratives (Roberti, 2021).

A study conducted by Abramo, Cecchini, and Morales (2019) analyzes the effectiveness of social programs in labor market insertion across eight Latin American countries (Argentina, Brazil, Chile, Colombia, El Salvador, Mexico, Peru, and the Dominican Republic).

The results of the meta-analysis indicate that the effect of labor inclusion programs on labor supply and job placement is positive in 41% of the studies and negative in 15%; the remaining percentage corresponds to non-significant effects (42%) or mixed results (2%). However, the authors found that the positive effects vary significantly between men and women (61% and 84%, respectively). They also report that the evidence shows positive impacts of labor inclusion programs on formal employment (39%), with more favorable impacts for men (78%) than for women (73%).

Regarding the effect of technical and vocational training on labor inclusion, 40% of the studies also showed positive results, and 15% indicated a negative impact. In this regard, the authors' review of various evaluation studies highlights that in Argentina, the Seguro de Capacitación y Empleo program increased participants' labor income and reduced the likelihood of holding informal jobs by 2.1%, as well as the chances of working excessive hours or being underemployed. The best outcomes were observed among the youth population. In Brazil, the PRONATEC/Bolsa Formação program led to an 11.8% increase in formal employment rates among participants, while the PlanSeq program increased the likelihood of finding a job by between

Table 1. Inventory of social programs for youth labor market inclusion in Latin America by Type of Support

Country / Social Program	Academic Remediation	Technical and Vocational Training	Support for Self-Employment	Job Placement Services	Direct Job Creation	Indirect Job Creation
Argentina						
Jóvenes con Más y Mejor Trabajo (2008-)	X	X	X	X		X
Programa Jóvenes con Futuro (PJCF) (2007-2012)	X	X				
Programa Jóvenes y MIPYMES -Te Sumo (2021-)				X		X
Bolivia						
Mi Primer Empleo Digno (2008-)		X	X			X
Programa de Mejora de la Empleabilidad y los Ingresos Laborales de los Jóvenes (2017 - 2021)		X		X	X	X
Brazil						
Programa Nacional de Estímulo al Primer Empleo (PNPE) (2003-2007)						X
Programa Nacional de Inclusión de Jóvenes - Projovem (2005-)	X	X				
Chile						
Justicia Juvenil – Intermediación Laboral para Jóvenes Sancionados (2015-)		X		X		
Programa Aprendices (2006-)		X				X
Subsidio al Empleo Jóven (SEJ) (2009-)						X
Yo Trabajo – Jóvenes (2007-)		X				
Colombia						
Camello Sí Hay (2021 - 2023)			X			X
Jóvenes en Acción (2001-)		X				
Jóvenes Rurales Emprendedores (2003-2015)			X			
Sacúdete (2019-)		X				
Costa Rica						
Empléate (2011-)		X		X		
Mi Primer Empleo (2015-)		X				
Ecuador						
Mi Futuro es Hoy (ex Empleo Joven) (2018 - 2021)		X		X		
Mi Primer Empleo (2007 -)		X				
El Salvador						
Programa JóvenES Con Todo (2014-)	X	X	X	X		
Programa de Apoyo Temporal al Ingreso (PATI) (2009-2016)		X			X	
Guatemala						
Beca Primer Empleo (2013-2018)		X				
Programa Beca Social (2018-)	X	X	X			X
Programa de generación de empleo y educación vocacional para jóvenes en Guatemala (2013-)		X		X		
Haiti						
Red temporal de Seguridad Social y Competencia para los Jóvenes (2020-)		X		X	X	
Honduras						
Con Chamba Vivís Mejor (2014-): Chamba Jóven		X			X	X
Formación profesional para jóvenes en riesgo de exclusión social (ProJoven) (2014-)		X				
Programa de Promoción al Empleo -PROEMPLEO (2004-2011)		X		X		
Jamaica						
Construyendo juventud para un desarrollo nacional (2002-)		X				
Red jamaicana de empleo juvenil (Jamaica Youth Employment Network) (2005-)		X		X		
Mexico						
Jóvenes con Prospera (Ex Jóvenes con Oportunidades 2003-2014) (2003-2019)	X					
Jóvenes construyendo el futuro (2019-)		X				
Red de Estrategias de Economía Social (REDES) (2021 -)		X	X			

Country / Social Program	Academic Remediation	Technical and Vocational Training	Support for Self-Employment	Job Placement Services	Direct Job Creation	Indirect Job Creation
Panama						
Aprender Haciendo (Ex Panamá Pro Joven) (2014-)		X		X		
Programa Padrino Empresario (2000-)		X				X
Paraguay						
Programa Conjunto Oportunidades (PCO) "Juventud: capacidades y oportunidades económicas para la inclusión social" (2009 - 2013)		X		X		
Programa de Formación Profesional con Metodología Dual (Mopadual) (2018 -)		X				X
Programa Primer Empleo (2021 -)		X		X		X
Peru						
Programa Nacional para la Empleabilidad (2011-)		X	X			
Programa para la Generación de Empleo Social Inclusivo "Trabaja Perú" (Ex Construyendo Perú) (2006-)					X	
Dominican Republic						
Programa Juventud y Empleo (PJE) (2003-)		X				
Trinidad and Tobago						
On the job training (2022 -)		X				X
Uruguay						
Compromiso Educativo (2010-)	X					
Empleo Juvenil (2013 -)		X				X
Jóvenes en Red (2012 - 2021)		X		X		
Yo Estudio y Trabajo (2012 -)		X		X		

Source: Own elaboration based on CEPAL (2024)

11.1% and 19.6%. In Colombia, the Más Jóvenes en Acción program increased women's income and employment by 18% to 20%. Other programs that also had positive effects on participants' income include: Jóvenes Rurales Emprendedores (Colombia), the Apoyo Temporal al Ingreso program (El Salvador), the Programa de Apoyo al Empleo (Mexico), and the Programa de Capacitación Laboral Juvenil–Projoven (Peru) (Abramo, Cecchini, & Morales, 2019).

The typology of labor and productive inclusion programs proposed by Abramo, Cecchini, and Morales (2019) helps highlight differences and similarities that allow us to categorize these programs in Latin America. This typology is based on five types of programs and narrows down three aspects: 1. Supply, 2. Demand, and 3. Intermediation. The first type focuses on supply. These are the most common in Latin America, as most are programs aimed at training or educating individuals seeking job placement. Another similarity is the target age range, typically between 15 and 30 years old, along with an emphasis on learning a technical skill or trade during the support period. In contrast, the second and third groups differ more clearly, as they address the demand side and labor intermediation. These programs do not necessarily target a specific age group and often involve employer engagement to balance the interests of both sides of the labor market.

Complementary strategies also help balance the typology and its variations, such as including health insurance, childcare, or transportation subsidies. These benefits especially support women in supply-side programs, making women the most benefited group in this type of labor inclusion initiative.

Labor insertion Social Programs in Mexico

In Mexico, several social and governmental programs have aimed to support labor market integration and skill development. From 2003 to 2019, the "Jóvenes con Prospera" program (formerly "Jóvenes con Oportunidades") operated with the objective of encouraging youth in poverty to complete upper secondary education before turning 22 years old. That is, this program supported labor insertion through an educational training strategy (academic leveling). Another program that ran from 2014 to 2018 was the Programa de Inclusión Laboral de Personas con Discapacidad (PIL), aimed at facilitating the labor inclusion of people with disabilities through training, education, and employer support and awareness.

Other mechanisms that have been implemented over the past decades and are still in operation include: a) Programa de Apoyo al Empleo which promotes job placement for unemployed or underemployed individuals through labor intermediation and mobility. It targets vulnerable groups such as youth, women, agricultural workers, and repatriated persons.; b) el Servicio Nacional de Empleo, which offers job counseling, training, and labor linkage services to help people find employment and supports companies in their talent search, and, c) Programa de Empleo Temporal, which provides temporary financial support to workers aged 16 and over who are affected by emergencies (natural, economic, or social).

Since 2019, the Jóvenes Construyendo el Futuro (JCF) program has been in operation. It provides vocational training to youth aged 18 to 29 who are not studying or working. As shown, this program adds to a long list of similar labor inclusion initiatives in Latin America and is not, as some have argued, an improvised policy with no foundation or potential as an active public policy.

Participants receive a monthly stipend and gain work experience in companies, social organizations, or government institutions. In 2022, female participation in the program was higher than male participation (58% and 42%, respectively). The program is run by the Ministry of Labor and Social Welfare (STPS), which conducted an evaluation and found that 62% of former participants successfully entered the labor market, while only 23% of non-participants did so. After completing the program, young men were more likely to find a job (STPS, 2021). That is, even though fewer men participated, they benefitted more in terms of employment outcomes (Castro, Huesca & Zamarrón, 2017; Llamas & Huesca, 2019, 2020).

Nah, Olmedo, and May (2021) evaluated two youth programs in the state of Campeche: the U008 Program: Subsidies for Youth Programs (2012–2018) under the Mexican Youth Institute (IMJUVE), and the JCF Program launched in 2019. Interviews with 10 former beneficiaries revealed that two participants found a job within two weeks of completing the program, four within a month, three within two months, and one after four months. In short, most found employment within one to two months after finishing the program.

The authors mention that, despite the success of the program, jobs are scarce and difficult to obtain, so it is also necessary to promote the creation of more jobs. They also warn that these programs must establish mechanisms to identify ghost companies, in order to avoid negatively impacting the achievement of the program's objectives (Nah, Olmedo, and May, 2021).

Another important skill that is sought to be developed among young people is the socio-emotional behaviors derived from this learning, as these skills are necessary for labor insertion (such as emotional self-control, adherence to rules, or business belonging, etc.) (STPS, 2021). For their part, Betanzos, Altamira, and Paz (2022) conducted a study analyzing the relationship between socio-emotional competencies and employability, with self-perception (the idea that the student has about themselves in terms of obtaining a job).

The result showed that when a person is effective in job searching, commitment, the desire to belong to the employed society, and coping with frustration predict the socio-emotional competencies of students (Betanzos, Altamira, and Paz, 2022). According to this, the student's self-perception is reflected in the confidence they present to potential employers. This is a characteristic that can be linked to the individual's ability to perform tasks. For this reason, transfer programs focused on insertion through training programs create confidence in young people to belong to the employability sector. According to a recent report (STPS, 2023), the labor insertion rate for participants in the JCF program is close to 60%, meaning 6 out of 10 participants who completed the program have found work after their training.

Thus, the scope and limitations of such programs in Mexico, particularly the JCF program, are that it could lead to employment sources tailored to the needs of the employer, since they would receive free labor during the first year of the scholarship. Without the necessary experience, skills, or training, this becomes an "open book" for understanding the needs, values, and goals that a company requires as a key advantage.

Regarding its scope, it is a nationwide program, where any physical or moral business person can participate to be selected for a candidate, with a monthly salary of 7,572 pesos as well as medical expense insurance at no cost to the company, which is adjusted to the minimum wage each year.

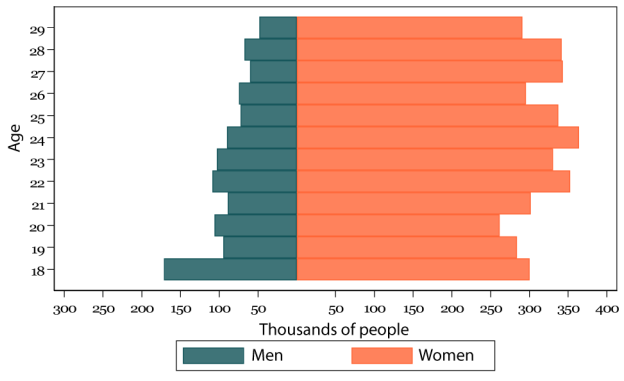
On the other hand, the limitations include vague dissemination of the program, which may be due to a lack of governmental resources for true nationwide coverage. An additional restriction would be the lack of a tracking register, at least one that is visible to the public, as well as the involvement of questionable practices with resources, such as using the scholarship as a salary in ghost companies.

Characterization of the population that neither studies nor works in Mexico

The JCF program seeks to be an active labor public policy, where young people can successfully integrate into the job market and feel confident that they are capable of developing a productive activity in labor terms. With this objective in mind, it is important to mention that, when looking at the program's eligibility criteria, no specific characterization has been found that allows understanding the magnitude of the labor issue this public policy addresses. Therefore, in this section, we contribute to defining this characterization at a national level, which is one of the contributions of this research.

In this regard, Graph 2 precisely indicates that the challenge for greater program effectiveness lies with females. Women, by age cohort, show a higher incidence of this labor phenomenon, with slight peaks at ages 22, 24, 27, and 28. However, the absolute levels within all ages that make up the eligibility criteria are high, exceeding 300,000 women.

Graph 2. Young people who neither study nor work by age: Mexico, 2022.

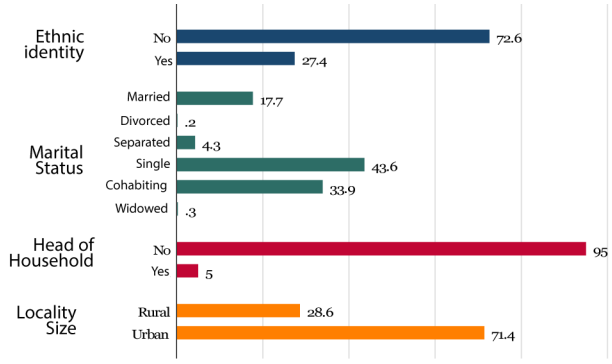


Source: Own elaboration based on ENIGH, 2022.

On the other hand, men make up less than half of the target coverage need in the program, with the youngest, 18-year-olds, being the ones who require the most support, with nearly 175,000 individuals. For the following age groups, between 19 and 24 years, the average is 100,000, and the need reduces by about 50,000 in the 25-29 age groups. It is concluded that young women face more labor restrictions, either due to access conditions or the lack of training or support, which the JCF program focuses on, and therefore, it should give higher priority to women.

Next, in Graphs 3 and 4, a more detailed characterization is made to understand the specific conditions that may lead the supported individuals to (or not) have greater success as a result of being beneficiaries. First, the attributes related to the ethnicity of the potential beneficiary are presented, where the majority are non-indigenous (72.6%) and indigenous (27.4%), due to the fact that most young people with potential to be supported are locate in urban areas (71.4%), leaving only 28.6% to.

Graph 3. Characterization of young people who neither stud nor work (percentage distribution



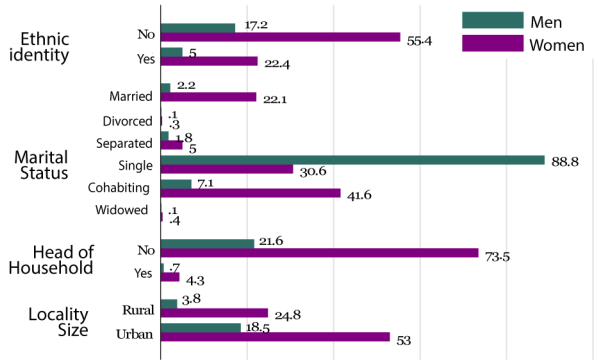
Source: Own elaboration based on ENIGH, 2022.

A larger proportion are also single (43.6%), but another significant portion are already living with a partner in a consensual union (33.9%). Another notable portion are married (17.7%), and the rest are separated (4.3%), with a residual 0.5% being divorced or widowed. This information highlights the potential for program improvement, as it allows for a more precise understanding of the types of attributes that could enhance support and, consequently, improve outcomes across the country. Most of the potential program beneficiaries are not heads of household, accounting for 95%, leaving only 5% as heads of family who may also be eligible.

Graph 4 breaks down the attributes of eligible individuals by sex. It is relevant here to address the question: What characteristic has the greatest impact on the labor inactivity of young women in the country?

From this, it is easy to observe that ethnic background has a greater impact on females, with 22.4% compared to only 5% for males. Similarly, among the non-ethnic eligible group, women are also much more affected, accounting for 55.4% versus 17.2% for men.

Graph 4. Characterization of youth who neither study nor work by sex (percentage distribution



Source: Own elaboration based on ENIGH, 2022.

It is of great importance to identify, in the characterization absent from the JCF program, the group of married individuals who require support. Here, women are by far the most affected, accounting for 22.1%, compared to only 2.2% of men in this marital status. Also significant are those in common-law unions, where again women are more impacted, representing 41.6%, while their male counterparts make up only 7.1%. Single status is more commonly associated with men, who make up a high percentage (88.8%), compared to only 30.6% of women.

Likewise, in terms of household headship, women have a higher incidence as potential eligible participants, with 4.3%, versus only 1.7% for men. Among those who are not heads of household, women again show higher relative presence (73.5%), while men account for a lower share (21.6%).

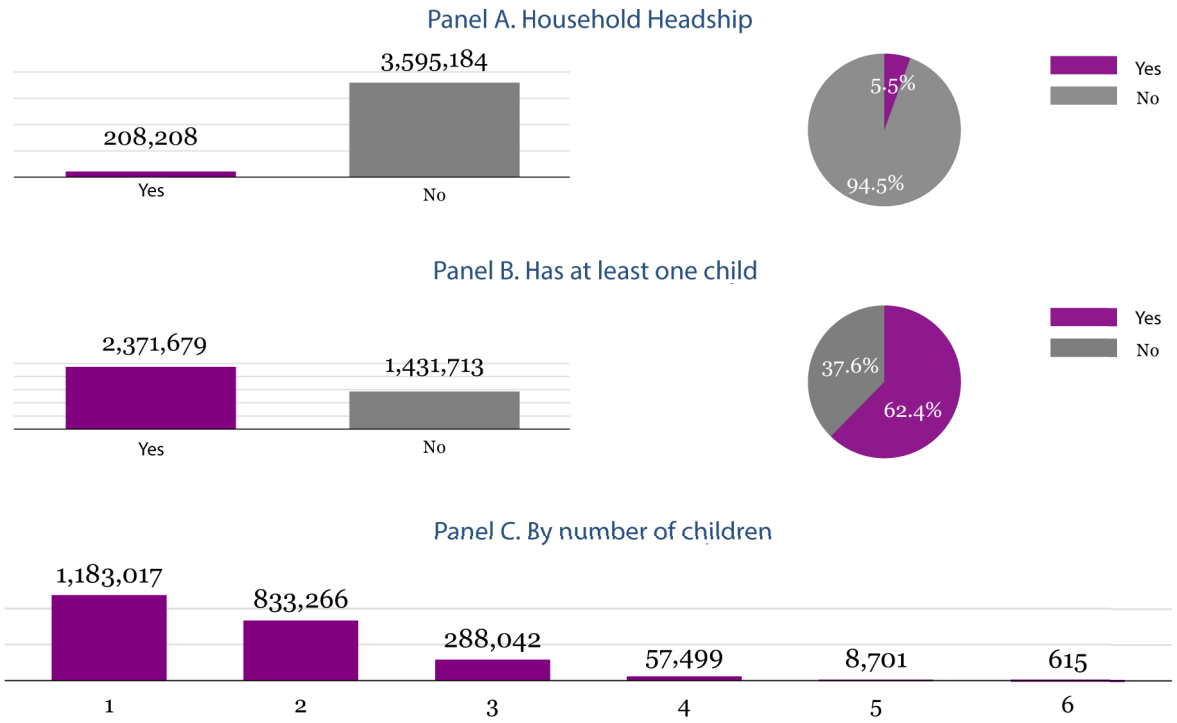
Finally, Graphs 5 and 6 present an additional, highly important breakdown by sex, focusing on the relevance of having children. This is a particularly fertile age range, which often prevents both sexes from continuing their studies, though it impacts women more due to pregnancy, childbirth, and the time required for childcare. As shown in Graph 5, women are significantly more impacted by having children. The majority (62.4%) have at least one child, amounting to a total of 2,371.6 thousand women in this condition. These women are the most vulnerable and should be prioritized by this kind of active public policy. Most eligible women are those with one child, totaling 1,183 thousand; those with two children amount to 833.2 thousand; and those with three or more children make up the remaining group, totaling 354.8 thousand highly vulnerable women in need of support.

On the other hand, it is noted that this condition also makes men vulnerable, as it prevents them from continuing their studies and accessing better employment opportunities. However, it is observed that most are not heads of household, with only 33,234 men in that role, in contrast to a significantly larger number of 208,208 women who are heads of household. This is largely since women have children and bear greater responsibility in this issue.

A smaller proportion of men (54.7%) have at least one child, totaling 52,180 eligible individuals in this condition. As the number of children increases, there is a decreasing trend in the number of men: 12,734 have two children and only 2,889 have three. Clearly, women are more vulnerable and should be a priority and essential focus of this type of labor insertion program. These programs should even be strengthened with childcare support included in the monthly monetary aid provided.

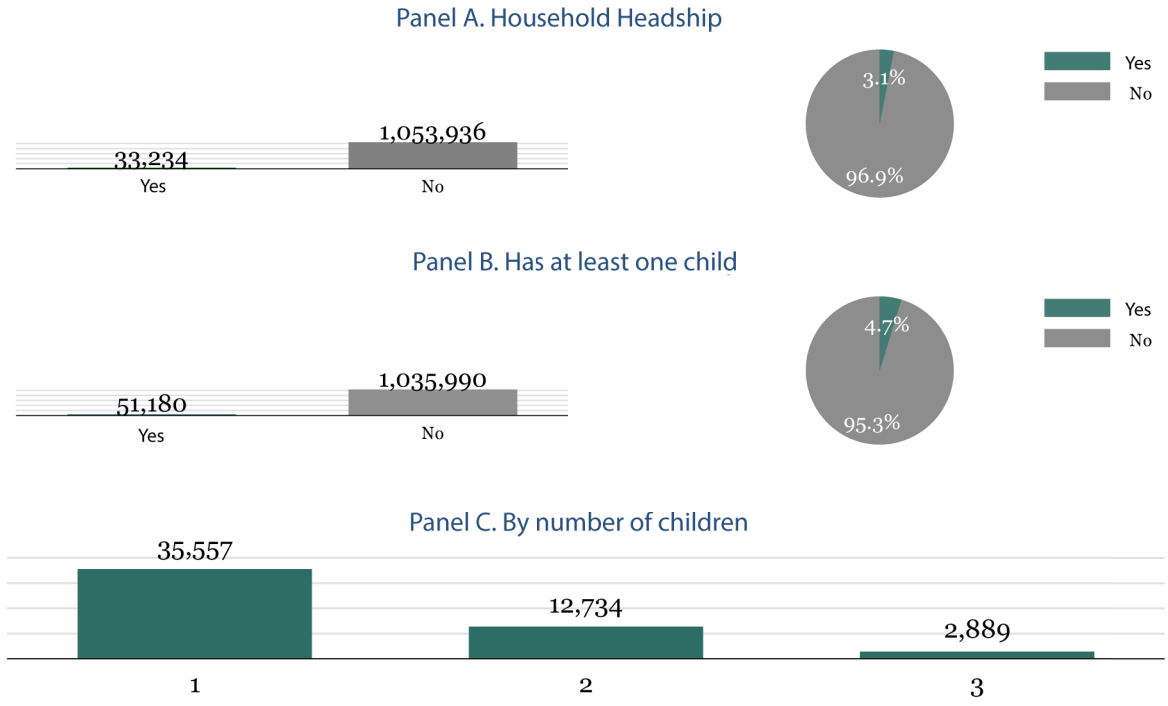
Finally, and no less important, in the characterization, the spatial distribution of those eligible for the program was mapped. As seen in Map 1, in relative terms, the majority of young people who neither study nor work are concentrated in the center of the country, with special emphasis on Estado de Mexico (15%), the states of Veracruz, Jalisco, and Mexico City (between 6% and 7% each), while the remaining states present a concentration of less than 6% each. A key point is that there is not a single state where the JCF program should not reach in order to cover all the eligible individuals described in this study.

Graph 5. Characterization of women who neither study nor work.



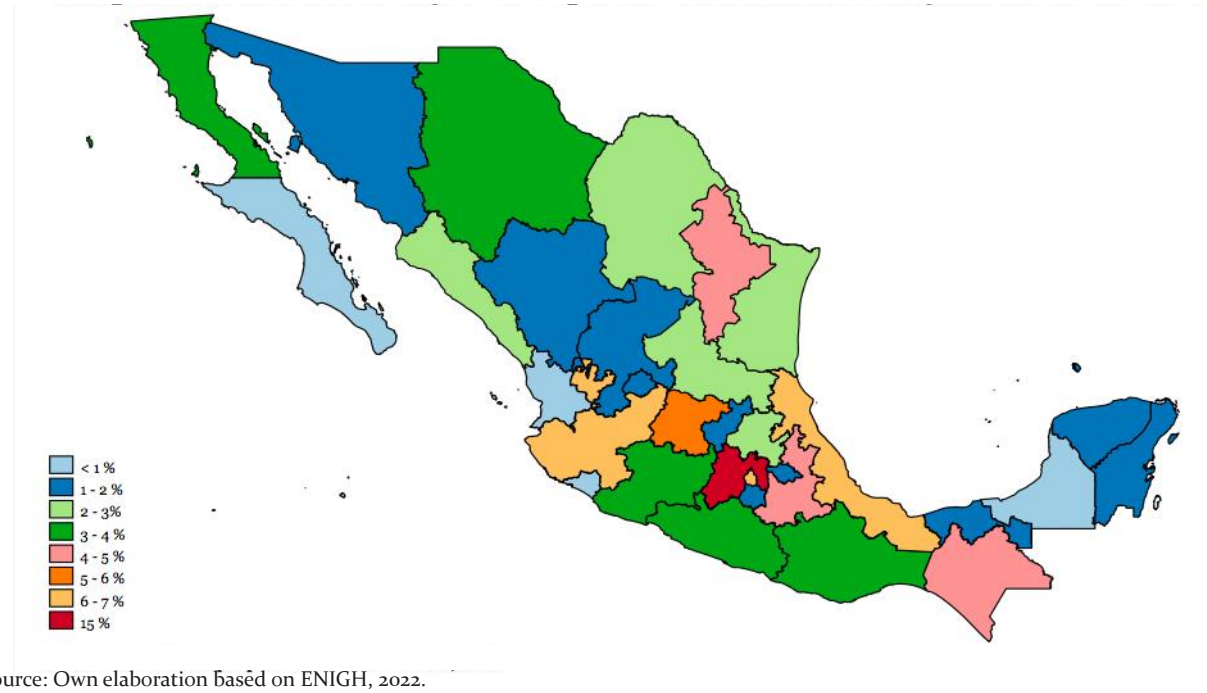
Source: Own elaboration based on ENIGH, 2022.

Graph 6. Characterization of men who neither study nor work.



Source: Own elaboration based on ENIGH, 2022.

Map 1. Distribution of youth who neither study nor work.



Source: Own elaboration based on ENIGH, 2022.

Discussion

A central point is to ensure continuity for these types of programs and initiatives, as practical experience has shown that they are useful and their application is of great importance in the labor economy, as well as in correcting negative externalities that can result from having a large number of vulnerable groups, such as young inactive individuals, within a society. There are elements that provide the necessary requirements, such as the amount of resources in a scheme where the JCF program is elevated to a constitutional level (Martínez, 2024; and Santos, 2024). Both studies emphasize this need for continuity to ensure the long-term existence of this support initiative. Santos (2024: 177) states that the objective of the initiative is to achieve "the right of people between the ages of eighteen and twenty-nine to receive a monthly financial support, as long as they are unemployed and not enrolled in any form of study."

With a current amount of $7,572 pesos per month, and incorporating them into the Mexican Institute of Social Security (IMSS) medical insurance for the time they are beneficiaries, and considering the total number of eligible people across the country, it is estimated that the annual resources required would be around $115 billion MXN if they remained constant. Therefore, a fiscal reform is needed to secure the sufficient resources to sustain the initiative. However, as the author argues, the target population in the long term is not expected to remain constant, which would require higher amounts of resources.

In summary, despite the positive results, the main criticism raised by Martínez (2024) and Santos (2024) is the very limited and unclear publicity of the program's indicators to measure its impact. There are also probable errors in its design and a high degree of overestimation in the population served, at least in 2019, resulting in a significant underspending of 40% (Santos, 2024: 179). On the other hand, a study conducted in Campeche (Nah, Olmedo, and May, 2021) showed the program was successful in integrating 90% of interviewed former beneficiaries into the workforce in less than 3 months. It was observed that despite the success of the program, jobs were scarce and difficult to obtain, and that the regulation of the program's use had to be periodic since fictitious companies could take advantage of the program's benefits. These are precisely the aspects the literature invites to study with more scientific rigor, and they represent future research lines emerging from this review, as this work is only a first approximation to the subject of study.

Conclusions

Labor insertion programs are not entirely new in this millennium and have existed as support for active labor policies in Europe since the 1980s, with greater prominence in the 1990s with the formation of the European Economic Community, now the European Union.

In Latin America, the country with the most labor support programs is Chile, which has shown success in their designs, achieving positive labor insertion rates. In the case of Mexico, the effectiveness of the JCF program is 60%. This is followed by Argentina, with lower effectiveness in insertion achievements, and Uruguay, placing Mexico and Colombia in the same ranking with the same number of labor support programs, followed by Brazil.

The JCF program is innovative for Mexico, as it addresses a group that had been displaced by employment schemes, either due to lack of a university degree or the required specialization for the job, or also due to labor segregation of positions, which has favored men over women in the labor market. Women should definitely be a priority in the eligibility rules for the JCF program in future improvements.

It is important to note that this work is a review article that aims to characterize the population and provide an empirical exposition of other programs managed internationally, leaving the exploration of appropriate techniques to verify the viability of such programs regarding employment insertion as future work.

There is a need for more regional studies to determine the impacts of these programs across the country. In general, the impacts appear to be of a high level in comparison with the results obtained in other countries. Even for Mexico, the effects could be three times higher in terms of improved insertion. The research agenda for these types of labor programs is open, inviting interested parties to conduct impact research using innovative econometric methods, such as statistical matching techniques. This would allow the success rates to be inferred at both the subnational level and by integrating Mexican regions, thereby continuing improvements as the economic dynamics remain positive, with the private sector investing more in human capital for Mexicans

References

Abramo, L. Cecchini, S. y Morales, B. (2019). Programas sociales, superación de la pobreza e inclusión laboral: aprendizajes desde América Latina y el Caribe, Libros de la CEPAL, N° 155 (LC/PUB.2019/5-P), Santiago, Comisión Económica para América Latina y el Caribe (CEPAL).

Betanzos N., Altamira & F. Paz V.M. (2022). "Empleabilidad y competencias socioemocionales en estudiantes de Administración". Universidad Autónoma del Estado de Morelos, Instituto Nacional de Neurología y Neurocirugía. Instituto de Investigaciones Psicológicas - Universidad Veracruzana Psicología y Salud, Vol. 32, Núm. 2: 363-373, julio-diciembre.

Castro Lugo, D., & Huesca Reynoso, L. (2007). Desigualdad salarial en México: una revisión. Papeles de población, 13(54), 225-264.

Castro, D.; Huesca, Reynoso, L. & Zamarrón, O. N. (2015). Discriminación Salarial por Género en la Industria Manufacturera de la Frontera Norte de México en el Periodo 2005-2011. Revista Noésis, vol. 24, núm. 47, pp. 51-80.

De la Rica S., Martinez de Lafuente D., & Lizárraga I. (2022). "Evaluación de impacto del programa de subvenciones salariales para jóvenes "Lehen Aukera". Marzo 2022. Euskeda España.https://iseak.eu/documentos/evaluacion-de-impacto-del-programa-de-subvenciones-salariales-para-jovenes-lehen-aukera/

Deng Z., Rubab Arim, Golo Henseke, Ingrid Schoon, Hans Dietrich, Aisling Murray, Emer Smyth, & Véronique Dupéré, (2023). "Youth unemployment in Canada, Germany, Ireland, and the United Kingdom in times of COVID-19". Nmnn

Ghoshray A., Ordóñez J., & Sala H., (2016) "Euro, crisis and unemployment: Youth patterns, youth policies?" https://www.sciencedirect.com/science/article/pii/S0264999316301407

INEGI (2024). Comunicado de prensa número 173/24 29 de febrero de 2024.

https://www.inegi.org.mx/contenidos/saladeprensa/boletines/2024/IOE/IOE2024_02.pdf

ILO (2022). Tendencias Mundiales del Empleo Juvenil 2022: Invertir en la transformación de futuros para los jóvenes. Disponible en: https://www.ilo.org/es/publications/tendencias-mundiales-del-empleo-juvenil-2022-invertir-en-la-transformacion

Kahn, L. B. (2010). The long-term labor market consequences of graduating from college in a bad economy. Labour economics, 17(2), 303-316.

Llamas, Rembao, L., Huesca, Reynoso, L. & Flores, L.G.

(2019). Desigualdad y justicia en la remuneración por género en México y la frontera norte. Revista Análisis Económico, 34(86), pp. 65-89.

Martínez, Soria, J. (2024). Opinión técnica sobre la iniciativa del Ejecutivo Federal para constitucionalizar los apoyos económicos a jóvenes que no estudian ni trabajan. Análisis del proyecto de decreto por el que se adiciona un segundo párrafo al artículo 123 de la Constitución Política de los Estados Unidos Mexicanos. (CPEUM), Anexo 17. En: Cap. Seis. Jóvenes Contruyendo el Futuro. Descargado de: https://tinyurl.com/mus8833t

Nah Uriostegui S.A., Olmedo Vela A., & May Pacheco M. (2021). "La política pública en materia de juventud: Campeche 2015-2021" Las Ciencias Sociales en la transición, coordinado por Jorge Cadena-Roa y María Luisa Martínez Sánchez, caen bajo la licencia de Creative Commons Atribución-Sin Derivar 4.0 Internacional (CC BY-ND 4.0). Universidad de Campeche. México: COMECSO.

OIT, (2024), El Programa de apoyo a las políticas de empleo y formación de jóvenes en el Uruguay. https://www.oitcinterfor.org/general/programa-apoyo-jovenes-uruguay

OIT (2024). Pomoting youth employment Songkhala and Yala Thailand
https://www.ilo.org/publications/promoting-youth-employment-songkhla-and-yala-thailand

OIT (2024). ILO, International training center, Recuperado [01 mayo 2024] https://www.itcilo.org/about

ONU (2024). Objetivos de Desarrollo Sostenible. https://www.un.org/sustainabledevelopment/es/economic-growth/

ONU (2023). Informe de los Objetivos de Desarrollo Sostenible 2023. Disponible en: ttps://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023_Spanish.pdf

Pastore, F. (2015) "The European Youth Guarantee: labor market context, conditions and opportunities in Italy". IZA J Labor Stud. 4 , 11 (2015). https://link.springer.com/article/10.1186/s40174-015-0033-2#citeas

Santos, Flores, I. (2024). Jóvenes Construyendo el Futuro. Una revisión a las necesidades de la juventud en México. En: Cap. Seis. Jóvenes Contruyendo el Futuro. Descargado de: https://tinyurl.com/mus8833t

SEDESOL, Secretaría de Desarrollo Social, 2016, Diagnóstico del Programa U008 "Subsidios a programas para jóvenes" a cargo del Instituto Mexicano de la Juventud (IMJUVE) https://www.gob.mx/cms/uploads/attachment/file/225919/Diagn_stico_del_Programa_U008__mayo_2016_.pdf

STPS, Secretaría de Trabajo y Prevención Social, 2023, (2023, 12 abril) "Programa presupuestario S-280 Jóvenes Construyendo el Futuro". Agosto de 2021 https://jovenesconstruyendoelfuturo.stps.gob.mx/publico/doc/DIAGNOSTICO_2021_PP_S-280_JCF.pdf

STPS, Secretaría de Trabajo y Prevención Social, 2023, (2023, 30 junio) Jóvenes Construyendo el Futuro. https://jovenesconstruyendoelfuturo.stps.gob.mx

Taléns E.E. (2017). La implantación del Sistema Nacional de Garantía Juvenil en España. Revista Internacional y Comparada de Relaciones Laborales y Derecho del Empleo. [Recuperado por 17 de abril 2024], Garantía Juvenil Revista ADAPT, Volumen 5, núm. 3, julio-septiembre de 2017 p. 103 a la 134
https://www.academia.edu/35058964/Garant%C3%ADa_Juvenil_Revista_ADAPT_pdf?email_work_card=view-paper

Vezza, E. (2021). Programas de empleo juvenil: revalidación de su papel en la agenda pública pospandemia de COVID-19. Documentos de Proyectos (LC/TS.2021/88), Santiago, Comisión Económica para América Latina y el Caribe (CEPAL).

Weller, J. (2006). Los jóvenes y el empleo en América Latina. Desafíos y perspectivas ante el nuevo escenario laboral. Bogota: Mayol Ediciones, CEPAL Ed, 301.

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Analysis of the social impact of the public policy NODESS implemented by INAES

Análisis del impacto social de la política pública NODESS implementado por INAES

Date received: July 19, 2024

Eustacio Díaz Rodríguez[1], Blanca Verónica Moreno García[2] y Robert Beltrán López[3]

Date of approval: September 24, 2024

[1] Doctor in School and Educational Administration, Professor at the Tecnológico Nacional de México / Instituto Tecnologico de Chetumal, Academic Body ITCHE-CA-7: Business Accounting and Governance, National Candidate Researcher in the SNI-CONAHCYT.
Email Address: eustaci.dr@chetumal.tecnm.mx. ORCID: 0000-0003-0968-5766

[2] Corresponding Author. Doctor in Human Development, Professor at Tecnológico Nacional de México / Instituto Tecnológico de Chetumal, Academic Body ITCHE-CA-7 Business Accounting and Governance.
Email Address: blanca.mg@chetumal.tecnm.mx. ORCID: 0000-0002-3045-2580

[3] Doctor in Administrative Sciences, Professor at Tecnológico Nacional de México / Instituto Tecnológico de Chetumal, Academic Body ITCHE-CA-7 Business Accounting and Governance, National Researcher Level I in the SNI-CONAHCYT.
Email Address: robert.bl@chetumal.tecnm.mx. ORCID: 0000-0001-5667-8732

Abstract

This research focuses on the social impact of the Nodos de Impulso a la Economía Social y Solidaria (NODESS) implemented by the National Institute of Social Economy (INAES), based on the social, environmental, or economic results directly attributable to these public policy initiatives in the community of Laguna Guerrero, Quintana Roo. The objective was to analyze the impact of these government programs on the cooperative located in the aforementioned region, considering that the importance of the studied variable directly influences the acceptance or rejection of Social and Solidarity Economy strategies. Therefore, the study is guided by Human Development, focused on the expansion of freedoms and opportunities with access to a dignified and fulfilling life. Methodologically, the research is based on an interpretive epistemology and a phenomenological paradigm, using a narrative life history design carried out in four phases with stakeholders. From the focus groups, the importance of understanding the meaning of this policy and its social scope was identified. In this sense, areas of opportunity related to the indicators used to assess social impact were identified, allowing for a deeper understanding of the complexity of human development.

Keywords: Public policy, Sustainable development.

JEL Codes: D63 Welfare Economics, I38 Welfare and Poverty.

Resumen

La presente investigación plantea el interés sobre el impacto social de los Nodos de Impulso a la Economía Social y Solidaria implementado por el Instituto Nacional de la Economía Social con base a los resultados sociales, ambientales o económicos directamente atribuibles a estos ejercicios de políticas públicas en la comunidad de Laguna Guerrero, Quintana Roo. El objetivo consistió en analizar el impacto de estos programas gubernamentales en la cooperativa de la entidad mencionada, considerando que la importancia de la variable estudiada afecta directamente en la aceptación-rechazo de las estrategias de la Economía Social y Solidaria, por lo que el estudio tiene como eje rector

el Desarrollo Humano enfocado en la expansión de las libertades y oportunidades con acceso a una vida digna y satisfactoria. Metodológicamente se parte de una epistemología interpretativa, con un paradigma fenomenológico a partir de un diseño narrativo de historia de vida realizado en cuatro fases con Stakeholders. De los grupos focales se deduce la importancia de entender el significado de esta política y sus alcances sociales. En este orden de ideas, se pudieron identificar áreas de oportunidad relacionadas con loa indicadores que se evalúan como parte del impacto social y capturar la complejidad del desarrollo humano.

Palabras clave: Política pública, Desarrollo sostenible.

Códigos JEL: D63 Economía del bienestar, I38 Bienestar y pobreza.

1. Introduction

Interest in the evaluation and measurement of the impact of the Social and Solidarity Economy [SSE] has been reaffirmed year after year (Alarcón & Álvarez, 2020; Graizbord, 2023; López & Martínez, 2023). The United Nations [UN] (2020) states that these processes are essential for organizations, as they provide a solid foundation for decision-making, improve operational effectiveness, and ensure accountability. Additionally, they help increase recognition among external stakeholders, which is why SSE organizations oriented towards collective interest consider them a mandatory function of management(Stott & Scoppetta, 2020; Alarcón & Álvarez, 2020).

Interest in public policy evaluation has evolved significantly over time. As noted by Blanco and Pérez (2022), in the 20th century, evaluation initially focused on administrative efficiency and financial control, driven by Frederick Taylor's scientific management. Caballero (2024) argues that after World War II, the growth of the welfare state and new social demands led to greater attention to the effectiveness of public policies. In the 1970s and 1980s, systems like the Planning, Programming, and Budgeting System [PPBS] emerged in the United States, linking planning with results evaluation. At the same time, the practice of social accounting evolved from corporate social responsibility to triple bottom line accounting (economic, social, and environmental) between 1970 and 1990 (ibid). With the New Public Management of the 1990s, the approach broadened to include efficiency and accountability, introducing standardized reporting frameworks such as the Balanced Scorecard at the beginning of the 21st century. Evaluation then became integral and participatory, incorporating technology and big data. This process culminated in the recognition of the social and solidarity economy, highlighting the importance of evaluating policies that promote cooperation and collective well-being (Hernández & Díaz, 2024).

1.1 Problem Statement

After an exhaustive search for information related to the impact of public policies of the Nodos de Impulso a la Economía Social y Solidaria [NODESS], there is an observed intention to evaluate them across four programmatic intervention dimensions: inputs, outputs, outcomes, and impacts. This is evident in reports from the National Institute of Statistics and Geography [INEGI] (2022, 2023, 2024); Estivill & Laville, 2020; Montegut et al (2024); Certainly, this represents an evaluation chain; therefore, it is essential to highlight that although the terms "impact" and "outcome" are often used interchangeably, their meanings differ (Aedo, 2005). On one hand, impact is defined as a change in social, environmental, or economic outcomes (positive or negative, expected or unexpected) that is directly attributable to an intervention, program, or investment. This means it is not only about defining indicators for resource consumption and outputs or specifying efficiency and effectiveness relationships but also measuring outcomes and their contribution to broader changes (Deubel, 2021). On the other hand, an outcome may result from an external cause, such as general economic improvement (Cañedo et al., 2022).

The experimental approach, with its use of random assignment and strict control of variables, and the quasi-experimental approach, with techniques like matching to create comparable groups, have been acclaimed for their methodological robustness in impact measurement. They can establish clear causal relationships, control bias, and provide reliable and precise results, which are fundamental for public policy evaluation and informed decision-making. These ensure interventions are based on solid and verifiable evidence (Stott & Scoppetta, 2020). However, in practice, these approaches can pose logistical, financial, procedural, ethical, and political challenges (Herrera, 2023). Other methods

may be used, albeit with the limitation of making only credible causal claims about the contribution of interventions to observed results.

Following the Human Development indicators proposed by Sen (2023) and Nussbaum (2023), it is crucial to take methodological precautions regarding causality, attribution, and error control. These are essential for providing solid evidence that the observed outcomes are attributable to a social policy itself and not to other factors. As Schütz (1972, cited in Pineda, 2024; Colmenares, 2023) affirms, the lack of interaction within a society can hinder effective program evaluation by limiting feedback, understanding of individual experiences, data collection, and alignment between program goals and beneficiaries' realities. Therefore, according to Moreno et al. (2023), fostering dialogue and interaction among program stakeholders can bring researchers closer to a comprehensive and accurate evaluation of its impact. It is worth noting that in the community of Laguna Guerrero, Quintana Roo, Mexico, where the study takes place, preliminary fieldwork observations show limited interest in providing precise feedback on the effects of social program implementation. There is uncertainty in the community regarding which results can be attributed to the NODESS program. This highlights the need to investigate, in detail, the program's social and economic impact on the community.

According to Martín (2021), the terms social impact evaluation and social impact measurement are increasingly used to show a preference for indicators that can be monetarily and quantitatively assessed. This trend accompanies the rise of social entrepreneurship, social enterprises, and the growing interest from actors in social investment and social finance (UN, 2020).

Evidence-based policies and practices may be seen as a way to depoliticize public decision-making and counteract the particularistic biases of philanthropic donations, which are often reduced to cost-benefit analysis, cost-effectiveness analysis, social return on investment, and life-cycle impact evaluation. These do not necessarily focus on human development, whose goal is to improve people's quality of life and well-being and foster their capacity to reach their full potential (Estivill & Laville, 2020; Moreno & Moreno, 2023a; Hernández & Díaz, 2024).

Guiding Axis: Human Development

According to Sen (2023) and Nussbaum (2023), SSE public policies play a crucial role in sustainable human development by improving material living conditions and empowering individuals and their communities. From Maslow's perspective (1982, cited in Sen, 2023), these policies satisfy both basic and higher-level needs, promoting a dignified and fulfilling life. From Sen's (2023) standpoint, SSE policies are essential for providing people with the capabilities and opportunities needed to lead meaningful and fulfilling lives. Therefore, social policies grounded in his approach do not only seek to improve material well-being but also strengthen people's ability to choose and achieve their individual and collective goals, as part of the fundamental human right freedom (UN, 1948).

Based on the previous reflections, the following question arises:

Research questions

What is the social impact of the NODESS public policy implemented by INAES?

General Objective

To analyze the social impact of the NODESS public policy implemented by INAES.

Specific Objectives

To analyze how the implementation of NODESS has contributed to the social and economic inclusion of beneficiaries, considering variables such as access to decent employment, participation in the local economy, and reduction of inequality.

To identify the social impact of NODESS on the development of participants' skills and competencies, including training, education, and technical formation provided through the program.

To examine how NODESS has influenced the development of local communities and social cohesion by fostering cooperative networks, mutual support, and community collaboration.

2. Theoretical Framework

Public policies are a set of government actions and decisions aimed at solving public problems. According to Dye (1992, cited in Valencia & Álvarez, 2008, p. 109), a public policy is defined as "everything the government chooses to do or not do." As Cuen et al. (2023) state, public policies involve designing strategies and plans that address specific societal needs. In the context of NODESS, public policies focus on promoting the social and solidarity economy, aiming for inclusive and sustainable development (National Institute of the Social Economy [INAES], 2023).

The Social and Solidarity Economy (SSE) is based on principles of equity, solidarity, and cooperation. It is an approach that prioritizes social well-being over profit and consists of organizations such as cooperatives, mutual societies, associations, and social enterprises (INAES, 2023). Estivill & Laville (2020) define SSE as an economic sector that combines economic activity with social goals. NODESS, as a public policy promoting SSE, seeks to strengthen these organizations to contribute to the economic and social development of communities (INAES, 2023).

Social well-being refers to the state in which individuals' basic needs are met and their ability to live a dignified and fulfilling life. According to Sen (2023), human well-being should not be measured solely by income, but also by people's capabilities to achieve their goals and lead lives they value. By supporting the social and solidarity economy, NODESS contributes to improving social well-being by promoting economic inclusion and reducing inequality.

Human development is a comprehensive concept that goes beyond economic growth. The United Nations Development Programme [UNDP] (2020) defines human development as the process of expanding people's opportunities and capabilities, allowing them to live long, healthy, and creative lives. Sen's (2023) human development theory emphasizes the importance of individual capabilities in achieving well-being. NODESS, by promoting the social and solidarity economy, contributes to human development by enhancing opportunities and capabilities in vulnerable communities.

The theory of social capital, popularized by authors such as Montegut et al. (2024), highlights the importance of social networks, trust, and cooperation for economic and social development. Social capital refers to the resources available in relationships and social networks, which can facilitate collective action and community well-being. By fostering the creation and strengthening of cooperatives and social enterprises, NODESS builds social capital, promoting cohesion and community development (Sanabria & Salgado, 2023).

Governance theory focuses on how public decisions are made and implemented, involving not only the government but also private and civil society actors. Kooiman (2020) states that governance is a dynamic and flexible process that reflects the interaction and cooperation between different actors in managing public affairs, where power and authority are not solely concentrated in the State but are distributed through various networks and partnerships. NODESS represents an approach to collaborative governance, where the state, social organizations, and the community work together to achieve common goals (INAES, 2023).

3. Methodology

Approach

Grounded in Sen's Human Development Theory and the methods for building relevant evidence proposed by the United Nations Research Institute on Social Development [UNRISD] (2022) based on the aforementioned theory to measure the impacts of social policy in political, economic, and social dimensions the authors of this study chose a qualitative approach. According to Ríos (2024), this approach allows for the use of techniques and the design of tools that address perceptions of the social impact of public policies through concepts, beliefs, emotions, thoughts, and mental images. In line with Zúñiga et al. (2023), this epistemology makes it possible to identify, validate, and analyze aspects related to social impact, enabling a protagonist-centered understanding of experiences regarding implemented policies.

Relevance.

The relevance of choosing a phenomenological approach lies in its aim to "understand the meaningful structure of the world of everyday

life" (Schütz, 1972, p. 73), giving priority to the social world with respect to the phenomenon of consciousness. Pineda (2024) asserts that this theoretical current focuses on everyday life; its main interest lies in understanding how different aspects are related, aiming to analyze intersubjectivity and the relationship between one Self and another Self, based on the observation and analysis of lived experiences.

Methodological steps of the research

Considering the methodology proposed by Piza et al. (2019), the research was carried out in four phases, as follows:

1. Preparatory phase. This included the reflective stage and the design stage, during which the activities to be carried out in the following phases were planned.
2. Fieldwork. In this phase, the field was accessed, where wandering and map construction were conducted. A productive data collection process was also carried out, based on the criteria of data sufficiency and adequacy.
3. Analytical phase. This involved data reduction, organization, and transformation. Results were obtained, and conclusions were verified.
4. Informative phase. This consisted of the preparation of the final report.

Subjects

Table 1. Stakeholders proposed for analysis.

Stakeholder Mapping for NODESS (N2323000004)				
Direct Beneficiaries	**Indirect Beneficiaries**	**Government Institutions**	**Social Actors**	**Private Sector**
Coconut Producers Cooperative	Families of Entrepeneurs	Instituto Nacional de la Economía Social (INAES)	Ejidatarios (communal landholders) of Laguna Guerrero	Local Merchants
Community of Laguna Guerrero, Q.R.	Local Consumers	Secretariat of Economic Development		

Note. Boosting Node for the Social and Solidarity Economy (EES), Coconut Producers and Derivatives Cooperative of Laguna Guerrero, Q. Roo SC de RL de CV. Self-made.

Inclusion Criteria. Individuals who belong to the Cooperative of Coco Producers and Derivatives of Laguna Guerrero, who are direct beneficiaries of NODESS, over 18 years old. Members of communities that have been beneficiaries of NODESS programs. Individuals willing to participate voluntarily. Spanish-speaking individuals.

Exclusion Criteria. Individuals who do not reside in the specific areas of Quintana Roo where the NODESS policy was implemented. Individuals who reside temporarily (less than a year) in the region and do not have significant community involvement. Individuals under 18 years old. Individuals who have not interacted with NODESS programs. Individuals who have not been direct or indirect beneficiaries of NODESS policies. Individuals unwilling to participate. Individuals with physical or mental limitations that prevent their participation without adequate support. Employees of INAES directly involved in NODESS implementation, to avoid conflicts of interest. Individuals with personal or financial interests that could bias the research results. Individuals who do not speak Spanish.

Research Method

Narrative Design. Used in order to have a deep understanding of the studied topic, based on the experience of the subjects under study.

Research Techniques

Focus Group. Following the proposals of Espinoza et al. (2024), this technique was used to obtain detailed information regarding participants' perceptions, opinions, attitudes, and experiences related to the topic of study.

Autobiography. In this work, data were collected from the personal stories of the subjects and the narration of their experiences, with the aim of identifying, understanding, recording, and analyzing them. This means that the research focused on what the subjects of study said. The work had a biographical-narrative approach, which, according to Espinoza et al. (2024), has its own identity, as it not only centers on the collection and analysis of data, but is also essential for constructing knowledge in social research, given that it converges with various social areas, linking different fields such as life history, psychology, narrative anthropology, etc.

In-depth Interview (semi-structured). Used to

Dimensions and categories of social impact.

Table 2. Categories, domains, and dimensions involved in social impact.

Category	Domain	Dimension	
Economic	Jobs Generated	Direct and indirect jobs for cooperative members	
		Before Intervention	After Intervention
	Beneficiary Income	Average monthly/annual income of cooperative members	
		Before Intervention	After Intervention
	Access to Financing	Number of beneficiaries who obtained financing from cooperative members	
		Before Intervention	After Intervention
Policy	Opportunities	Access to education, health systems, community participation for cooperative members	
		Before Intervention	After Intervention
	Capacities	Decision-making capacity, self-sufficiency, independence, creativity, proactivity, leadership, empowerment of cooperative members	
		Before Intervention	After Intervention
Social	Teamwork	Cooperation, teamwork, discipline, commitment of cooperative members	
		Before Intervention	After Intervention
Psychological	competencies and skills	Knowledge, skills, motivation, empathy of cooperative members	
		Before Intervention	After Intervention

Note. *Self-made.*

obtain holistic, personalized, and contextualized information, allowing clarification of concepts from the subjects of study (Okuda and Gómez, 2005).

Data collection instruments

Interviewer (observation). López (2023) states that the researcher themselves is the real instrument of data collection in the qualitative process; therefore, they not only inquire but also serve as the means to obtain information.

Video Recorder. Used to record and replay information.

Data recording

Field Journal. Considered a support tool for the researcher to maintain precise records (López, 2023).

Autobiographical-Narrative Interview. Designed by the authors of the work, with questions based on the theories cited, investigating the particular experiences of the interviewee, with the aim of having them narrate their experiences and events from their personal life.

Research strategy

Triangulation. This is an important strategy to determine credibility. According to Okuda and Gómez (2005), triangulation is generally considered an appropriate approach for social research, as it allows data to be obtained from a more complete and reliable perspective on a phenomenon or topic of study.

It is important to emphasize that the results described in the previous table are consistent with the public policies promoted within the NODESS context, considering that they foster a social and solidarity-based economy aimed at inclusive and sustainable community development. This approach highlights equity, solidarity, and cooperation, prioritizing social well-being over profit and promoting people's ability to achieve their goals and lead a life they value.

By supporting the social and solidarity economy, NODESS contributes to improving social well-being by promoting economic inclusion and reducing inequality—an aspect that the

informants agree on, as they believe development should not be exclusive to a particular group. Instead, it should provide opportunities and challenges that enhance people's capabilities, pulling them out of the economic and social vulnerability in which the community had previously found itself. Through this, new forms of coexistence and interaction have emerged, fostering community cohesion.

In relation to the objectives of the ongoing research, emphasis is placed on the impact of NODESS on the social and economic inclusion of beneficiaries by facilitating access to decent employment and encouraging active participation in the local economy. These hubs not only create job opportunities but also contribute to reducing inequality by providing technical training and skill-building opportunities that improve participants' competencies. The education and training provided through NODESS allow individuals to acquire the necessary tools to compete in the labor market and start their own projects. Additionally, by strengthening cooperative networks and promoting community collaboration, NODESS reinforces social cohesion

4. Results

Table 3. *Stakeholders' perceptions of the social impact of the NODESS*

Stakeholders	Category		Perception
Direct Beneficiaries	Economic	+	They understand that the goal is to promote collaboration and mutual support. They believe it can strengthen the local economy and offer greater long-term economic stability.
		-	However, there is concern and recluctance due to uncertainty about the efficiency and long-term financial viability, doubting whether these policies can generate income to compete in a market dominated by large companies.
	Political	+	They are pleased to think that someone is currently concerned about them and their communities. They assume this is part of the democracy currently present in the country.
		-	On the other hand, they suspect that the programs are not genuinely motivated by the governor's interest but are just a strategy to gain favor and advance in political careers. They believe that once the opportunity passes, politicians will stop pretending and abandon this and other programs, using them as excuses to continue stealing.
	Social	+	They think that if the land weren't communal (ejido), community bonds and greater cohesion would be encouraged.
		-	However, many people do not trust the honesty of those involved and prefer to wait and see what happens to others before deciding to participate. They would rather avoid internal conflicts due to lack of commitment or potential unfair distribution of profits.
	Psychological	+	For now, they feel the same, but understand that over time, they could receive training that gives them tools to improve their productivity or products. They perceive empathy from professionals/ teachers/researchers who they believe are genuinely involved and also marginalized by lack of government support, assuming they could be the real solution for developing skills and knowledge.
		-	They report feeling stress and anxiety about the cooperative's future, which demotivates them.
Indirect Beneficiaries	Economic	+	Consumers haven't heard much about it but are surprised that someone is finally helping the community to make progress. They ask if they will also receive direct economic benefits, like with other social programs.
		-	Relatives of cooperative members say they haven't seen profits yet but understand that all processes take time to yield results.
	Political	+	They believe a transformation is finally taking place. Regardless of the NODESS public policies, they see other policies that are already benefiting them and assume this one might work too.
		-	They are skeptical about the true political will behind these initiatives, fearing they are more rhetorical than effective and genuine action.
	Social	+	They don't know what to think since there hasn't been any visible improvement in social fabric or collaboration.
		-	They don't understand how this public policy promotes solidarity among people who already live just to eat. Still, they think maybe in the far future, people will learn to cooperate for the common good, work in teams, or understand the importance of joining forces but they don't know how.
	Psychological	+	They feel hopeful and motivated to see that there are many options now to move forward; they say it gives them security.
		-	However, they also experience frustration and disappointment if the policies don't yield expected results. They remain skeptical and distrustful of public institutions and their ability to generate positive change

Stakeholders	Category		Perception
Government Institutions	Economic	+	They understand the concept and usefulness, infer that the Social and Solidarity Economy (ESS) has the potential to diversify the economy, foster local job creation, and promote more sustainable economic practices. Still, they believe it remains to be seen if this is true. They tend to view development through an economic lens.
		-	They express concern about the long-term efficiency and viability of these policies, doubting they can compete effectively in a globalized market without constant subsidies.
	Political	+	Concepts are well-defined; they know that civic participation is encouraged and the legitimacy of the government is reinforced by showing a commitment to social justice and equity. Some say the trend must be followed, and if ESS is in fashion, it must be embraced.
		-	They doubt the real ability to implement these policies effectively and fear that if something fails, it could discredit the government and reduce public trust in institutions, which they assume are trustworthy to most citizens.
	Social	+	They say NODESS promotes social cohesion, solidarity, and integration of marginalized communities, contributing to a more just and balanced society.
		-	They assume that structural inequalities are difficult to adequately address and that high expectations could lead to disappointment and social conflict, even if the institution believes itself capable.
	Psychological	+	They say it's nice to know they can offer support and generate well-being (in economic terms), which makes them feel like good, dignified people hoping to receive recognition for promoting progressive initiatives.
		-	They know there will always be criticism and dissatisfied people, and that's just how it is. They distance themselves from the responsibility of not meeting people's needs, asserting they do what they are supposed to nothing more, nothing less because everyone has needs, even them.
Social Actors	Economic	+	They think the policy could perhaps be viable long-term but prefer not to take risks, believing that in these types of initiatives, everyone wins or everyone loses. They doubt the ability to compete effectively with traditional and sustainable economic models without ongoing support. From experience, they say it's better to step back or not get involved when in doubt
		-	
	Political	+	They are skeptical of the government's true intentions, suspecting these policies are more about gaining electoral support than a genuine commitment to rural development.
		-	
	Social	+	They say that if they knew this was a 100% secure and effective policy, they would support the strengthening of community ties and cooperation among ejidatarios, which could improve social cohesion and solidarity.
		-	They believe it is difficult or impossible for a single policy to end inequalities and that some ejidatarios might benefit more than others, leading to divisions and resentment within the community.
	Psychological	+	They feel empowered knowing that to carry out this program, the government has to turn to them.
		-	They think it is worrying to think about the future of their families and their lands.
Private Sector	Economic	+	They believe everything comes down to working hard, and those who don't get ahead simply don't want to. They know these policies help the most in need and feel somewhat resentful, as they also need support but receive none. Still, they trust that at least NODESS might bring equity, reduce inequality, and generate a more stable long-term environment.
		-	However, they also feel that these policies could create unfair competition due to subsidies and government aid, possibly leading to decreased market efficiency and productivity.
	Political	+	They hope it fosters democracy and participation in economic decision-making.
		-	After seeing so much news, they believe the government is over-intervening in the market, possibly limiting business freedom and their ability to operate efficiently and profitably. They hadn't thought this way before and haven't had bad experiences yet, but they feel defensive.
	Social	+	They say that if cooperation between society and institutions can be implemented, it could lead to social justice and the reduction of inequalities, maybe even creating peaceful communities free of crime.
		-	However, based on experience, policies only benefit the relatives of those who grant them, rather than small business owners.
	Psychological	+	They would like to contribute to a fair and supportive economy, primarily because it would improve their corporate image and their relationship with local communities, with whom they could build alliances.
		-	However, at the moment, this new policy generates tension, anxiety, and uncertainty, as they worry it may affect their business and the market in general. They are concerned about the stability and predictability of regulations and government support.

Note. Results from focus groups on the social impact of the NODESS public policy in relation to the economic, political, social, and psychological categories. Own elaboration.

and the development of local communities, creating an environment of mutual support and cooperation that drives comprehensive economic and social growth.

5. Analysis and Discussion

The previous results reveal skepticism, doubt, and uncertainty due to a historical perception of corruption and poor resource management, which have been recurrent issues in many government administrations. As Beltrán et al. (2019) pointed out, these problems erode public trust, since stakeholders assume that resources are not used efficiently or equitably. However, due to the opportunities and access to social programs over the past few years programs derived from public policies aimed at low-income individuals a process of internalization has taken place, as described by Kelman (1965, cited in Mitchell, 2024). This internalization results from the congruence between experience and perception, vividly felt in the alignment between the support received and the values and beliefs relevant to current times. Congruence here is understood as the closeness between the "I am" and the "I should be" (Rogers, 2023, p. 79).

In this context, the role of transparency in NODESS public policy and decision-making processes must be highlighted, as it contributes to building trust among all stakeholders. As Beltrán et al. (2021) stated, when citizens do not clearly understand how decisions are made or how funds are spent, suspicion and skepticism increase.

The lived or perceived disconnect between past promises and actions has fueled distrust in the local government's capacity and willingness to implement a social and solidarity-based economic policy. Direct and indirect beneficiaries, social actors, government institutions, and the private sector may be reluctant to participate if they do not believe the policy will be managed fairly and effectively (Blanco & Pérez, 2022). This reluctance requires a significant shift in how the economy is structured and managed, as these changes may be seen as a threat by those who benefit from the current system (Cañedo et al., 2022). Another cause of reluctance is the lack of knowledge about how these policies work and their benefits, While organizations such as INAES or the Ministry of Economic Development may be trained in concepts related to the SSE and NODESS, it is necessary to adopt a humanistic awareness approach, so that collaborators move from being Type I—with "vague and superficial knowledge, and empirical administrative judgments" (Moreno & Moreno, 2023b, p. 11)—to truly understanding the meaning and social reach of these policies.

It is also necessary to consider that traditional economic actors, especially from the private sector, may see social and solidarity economy policies as unfair competition, especially if these policies include subsidies or support not available to all businesses (Cuen et al., 2023). The reluctance of various actors, particularly the private sector, can hinder the effective implementation of social and solidarity economy policies. This lack of cooperation and support may obstruct efforts to create a more inclusive and equitable economic environment (Graizbord, 2023).

There is a noticeable trend to measure social impact mainly in economic terms rather than through Human Development indicators. According to the UN (2020), Sen (2023), and Nussbaum (2023), this may be due to the ease of quantifying and accessing economic indicators such as GDP, income, and employment—tangible metrics that can be clearly evaluated. Indeed, economic benefits are often perceived more quickly than social ones, which are more closely tied to attitudes. As Likert (1965, cited in Santana et al., 2023) asserted, attitudes tend to form slowly. The internal mobilization of attitude begins with the cognitive component, which is strengthened through continuous experiences. Once certainty is established, behavioral changes occur.

6. Conclusion

To overcome distrust in government institutions and reluctance toward social and solidarity economy policies, it is crucial to enhance transparency, accountability, and citizen participation in the formulation and implementation of policies. Furthermore, it is necessary to adopt a holistic perspective that evaluates public policy impact in an integral, inclusive, and capability-centered manner. This implies going beyond traditional economic measures to consider how policies improve people's freedom and quality of life especially for the most vulnerable.

It is important to emphasize that evaluations must be participatory, contextually relevant, and use

mixed methods to capture the complexity of Human Development.

To conclude, it is evident that by implementing public policies through well-defined programs such as the case of NODESS and evaluating them precisely through the feedback of those involved, it can be stated, in response to the research question, that these programs generate a significant social impact on the communities where they are applied. Impact is understood as the social, environmental, and economic outcomes directly attributable to these public policy initiatives.

References

Aedo, C. (2005). Evaluación del impacto. CEPAL. https://repositorio.cepal.org/server/api/core/bitstreams/a32d735a-3408-4ff8-9216-af2ccb05cf47/content

Alarcón, M. & Álvarez, J. (2020). El Balance Social y las relaciones entre los Objetivos de Desarrollo Sostenible y los Principios Cooperativos mediante un Análisis de Redes Sociales. CIRIEC-España, Revista de Economía Pública, Social y Cooperativa, 99, pp. 57-87. DOI: 107203/CIRIEC-E.99.14322

Beltrán, R., Díaz, E., Rosado, L. & Selem, M. (2019). Capítulo 59. El efecto de la corrupción en las estrategias de gestión de las micro y pequeñas empresas. Caso: Bacalar, Quintana Roo, México. En Peña, A., Posada, R., Aguilar, Ó. y Narvaste, S. (Eds.). El efecto de la corrupción en las estrategias de gestión de las micro y pequeñas empresas latino. (Tomo II). pp. 209-220. Fontamara. https://bit.ly/3W9aaAn

Beltrán, R., Padilla, E. P. & Hamilton, K. I. H. (2021). Delincuencia como afectación operativa en micro y pequeñas empresas en Bacalar, Quintana Roo, México. Conciencia Tecnológica, (62), 8. https://dialnet.unirioja.es/servlet/articulo?codigo=8574632

Blanco, J. M., & Pérez, A. (2022). Evaluación del impacto social de políticas públicas de salud mental en España. Revista de Políticas Públicas y Salud, 10(2), pp. 45-62. DOI: 10.1234/rppss.2022.12345

Caballero, R. (2024). Herramienta de evaluación de políticas públicas. [Tesis de Maestría, Politécnica de Valencia]. Repositorio Institucional – Politécnica de Valencia http://hdl.handle.net/10251/201592

Cañedo, R., Mendoza, M. D. C. B., & Carmona, J. C. E. (2022). Los Nodos de la Economía Social y Solidaria como política de Estado en México: La experiencia del NODESS-REDESSGRO. Revista Iberoamericana de Economía Solidaria e Innovación Socioecológica, 5, pp. 95-118. https://doi.org/10.33776/riesise.v5.5319

Colmenares, A. F. C. (2023). La fenomenología social de Alfred Schütz: un aporte desde miradas complejas y transmetódicas de investigación. Revista Digital de Investigación y Postgrado, 4(8), pp. 27-44. https://doi.org/10.59654/n1avre40

Cuen, B., Bracamontes, J., & Camberos, M. (2023). El Desarrollo y bienestar de la población en municipios mineros del Estado de Sonora. Vértice universitario, 25(94). https://doi.org/10.36792/rvu.v25i94.65

Deubel, A. (Ed.) (2021). Enfoques para el análisis de políticas públicas. Universidad Nacional de Colombia. https://goo.su/UkHc1

Espinoza, E. M., Ramírez, J. S., Tapia, N. C., Zapata, E. A. H., Sotelo, E. A., Vargas, L. B. & Porras, D. V. V. (2024). La investigación cualitativa, sus aportes teóricos, metodológicos y prácticos. Fondo Editorial–Ediciones Universidad Cooperativa de Colombia. https://goo.su/NOitdv

Estivill, J., & Laville, J. L. (Eds.). (2020). Economía solidaria i historia social. Icària. http://www.porticolibrerias.es/toc/9788498889574.pdf

Graizbord, B. (2023). El G20 y el fortalecimiento de la alianza mundial para el desarrollo sostenible (ODS 17). Revista Mexicana de Política Exterior, (126), pp. 187-205. https://revistadigital.sre.gob.mx/index.php/rmpe/article/view/2625

Hernández, A., & Díaz, C. (2024). Análisis de impacto social de políticas de reducción de la pobreza en América Latina: Lecciones aprendidas y desafíos futuros. Revista Latinoamericana de Desarrollo Social, 20(2), pp. 180-195. DOI: 10.9012/rlds.2024.97531

Herrera, J. J. R. (2023). Límites y contradicciones del Programa de Fomento a la Economía Social 2021-2024 en México. Boletín de la Asociación Internacional de Derecho Cooperativo, (62), pp. 71-93. https://doi.org/10.18543/baidc.2489

Instituto Nacional de Estadística y Geografía [INEGI] (2022). Informe de evaluación de políticas públicas en México. https://www.inegi.org.mx

Instituto Nacional de Estadística y Geografía [INEGI] (2023). Informe operativo. Encuesta Nacional de Calidad e Impacto Gubernamental 2023. https://shre.ink/g0ZV

Instituto Nacional de Estadística y Geografía [INEGI] (2024). Población de Quintana Roo: Estimaciones y proyecciones 2024. www.inegi.org.mx

Instituto Nacional de la Economía Social [INAES] (2023). Informe anual de evaluación de los NODES. https://www.inaes.gob.mx

Kooiman, J. (2020). Exploring the concept of governability. In Theory and Methods in Comparative Policy

Analysis Studies (pp. 240-259). Routledge. https://acortar.link/15Qd45

López, A. M. (2023). La entrevista en profundidad y la observación directa: observaciones cualitativas para un enfoque holístico. Caminos de utopía: Las ciencias sociales en las nuevas sociedades inteligentes, 1(33), pp. 739-749. https://goo.su/TgZy6

López, E., & Martínez, M. (2023). Análisis de impacto social de políticas de vivienda en zonas urbanas de América Latina. Revista Latinoamericana de Políticas Públicas, 15(1), pp. 78-92. DOI: 10.5678/rlpp.2023.54321

Martín, F. L. (2021). Impulso a la economía social y solidaria en Guerrero para el desarrollo sostenible. Foro de estudios sobre guerrero, 8(1), pp. 350-361. https://revistafesgro.cocytieg.gob.mx/index.php/revista/article/view/120

Mitchell, C. (2024). Capítulo 9. Broadening the Use of Interactive Problem-Solving. En Pearson (Ed.). Shifting Protracted Conflict Systems Through Local Interactions. (pp. 176-194). Routledge. https://doi.org/10.4324/9781003340522

Montegut, Y., Colom, A., & Plana, M. (2024). Las Cooperativas Agrarias Centenarias en Catalunya: Características y contribución a los ODS. CIRIEC-España, revista de economía pública, social y cooperativa, (110), pp. 129-161. https://ciriec-revistaeconomia.es/wp-content/uploads/CIRIEC_110_05_Montegut_et_al.pdf

Moreno, B. V. & Moreno, F. J. (2023b). Estilo de actuación organizacional enfocado al desempeño del colaborador quintanarroense con base a la clínica del comportamiento laboral. LATAM Revista Latinoamericana de Ciencias Sociales y Humanidades, 4(5), pp. 1094-1108. https://doi.org/10.56712/latam.v4i5.1380

Moreno, B. V. & Moreno, F. J. (2023a). Identificación de la Dinámica de la Violencia Familiar Desde la Perspectiva Clínica Psicológica Pericial. Ciencia Latina Revista Científica Multidisciplinar, 7(6), pp. 123-144. https://doi.org/10.37811/cl_rcm.v7i6.8584

Moreno, B. V., Díaz, E., & Beltrán, R. (2023). Evaluación postpandemia de los riesgos psicosociales en el personal docente: caso instituto tecnológico de Chetumal en Paz Reyes J. (Coord), Banda Izeta, H; Méndez, L; Rodríguez, L. & López, R. (Eds.), Impacto de la educación superior en la agenda 2030, 1 (12), pp. 89-104. ANFECA. https://doi.org/10.5281/zenodo.10056536

Nussbaum, M. C. (2023). Capabilities and social justice: Revisiting the human development approach. Journal of Human Development and Capabilities, 24(1), 12-28. https://doi.org/10.1080/19452829.2023.1234567

Okuda, M. & Gómez, C. (2005) Métodos en investigación cualitativa: triangulación. Revista Colombiana de Psiquiatría, 34(1), pp. 118-124. https://www.redalyc.org/pdf/806/80628403009.pdf

Organización de las Naciones Unidas [ONU] (1948). Declaración universal de los derechos humano, Resolución 217 (III). 183a. sesión plenaria. Paris: Organización de las Naciones Unidas. https://www.ohchr.org/sites/default/files/UDHR/Documents/UDHR_Translations/spn.pdf

Organización de las Naciones Unidas [ONU] (2020). Transforming our world: The 2030 Agenda for Sustainable Development. https://sdgs.un.org/2030agenda

Pineda, C. (2024). Apropiación y crítica de Heidegger en el joven Marcuse. La aporía fundamental de la fenomenología dialéctica. Valenciana, 17(33), pp. 113-142. https://doi.org/10.15174/rv.v16i33.740

Piza, N. D., Amaiquema, F. A., & Beltrán G. (2019). Métodos y técnicas en la investigación cualitativa. Algunas precisiones necesarias. Conrado, 15(70), pp. 455-459. https://goo.su/4dMBJ

Programa de las Naciones Unidas para el Desarrollo [PNUD] (2024). Informe sobre desarrollo humano 2023/2024. https://hdr.undp.org/system/files/documents/global-report-document/hdr2023-24snapshotsp.pdf

Ríos, C. (2024). Investigación cualitativa en el contexto de la Salud Pública: actualización de conceptos. Revista de salud pública del Paraguay, 14(1), pp. 51-58. https://doi.org/10.18004/rspp.2024.abr.08

Rogers, C. (2023). El proceso de convertirse en persona. Planeta Publishing Corporation. https://www.planetadelibros.com/autor/carl-r-rogers/000024912

Sanabria, N. C., & Salgado, L. (2023). Aproximación al Concepto de Asociatividad Agropecuaria Como Desarrollo Rural. Vértice universitario, 25(94). https://doi.org/10.36792/rvu.v25i94.68

Santana, M. A. L., Ulloa, F. J. J., & Alcalá, M. T. C. (2023). Dificultades de los Estudiantes en el uso de las reglas del Algebra. Matemáticas, Ingeniería y Ciencias Ambientales, 7(12), pp. 16-26. https://revista-mica.com/index.php/mica/article/view/74/73

Schütz, A. (1972). Fenomenología del mundo social. introducción a la sociología comprensiva. Paidós. https://goo.su/ynriB

Sen, A. (2023). Quality of life and capabilities: Reflections on the human development index. Journal of Human Development and Capabilities, 24(2), pp. 199-218. https://doi.org/10.1080/19452829.2023.1234568

Stott, L., & Scoppetta, A. (2020). Alianzas para los Objetivos: Más allá del ODS 17. Revista Diecisiete:

Investigación Interdisciplinar para los Objetivos de Desarrollo Sostenible., (2), pp. 29-38. 10.36852/2695-4427_2020_02.02

United Nations Research Institute on Social Development [UNRISD] (2022). Crises of inequality: Shifting power for a new eco-social contract. Geneva: United Nations Institute for Social Development, UNRISD. https://cdn.unrisd.org/assets/library/reports/2022/full-report-crises-of-inequality-2022.pdf

Valencia, G. D., & Álvarez, Y. (2008). La ciencia política y las políticas públicas: notas para una reconstrucción histórica de su relación. Estudios políticos, (33), pp. 93-121. http://www.scielo.org.co/pdf/espo/n33/n33a5.pdf

Zúñiga, P. I. V., Cedeño, R. J. C., & Palacios, I. A. M. (2023). Metodología de la investigación científica: guía práctica. Ciencia Latina Revista Científica Multidisciplinar, 7(4), pp. 9723-9762. https://doi.org/10.37811/cl_rcm.v7i4.7658

REVISTA VÉRTICE UNIVERSITARIO
http://www.revistavertice.uson.mx

UNIVERSIDAD DE SONORA

Interdisciplinary Faculty of Economic and Administrative Sciences

RESEARCH

Governance of Value Chains and Labor Migration: A Comparative Study in the Coffee Industry of Costa Rica, Honduras, and Mexico.

Gobernanza de Cadenas de Valor y Migración Laboral: Un Estudio Comparativo en la Industria Cafetalera de Costa Rica, Honduras y México.

Date received: October 6, 2024 Date of approval: November, 4, 2024

Humberto García-Jiménez[1], Bruno Gandlgruber[2] y Carla Zamora Lomelí[3]

[1] Corresponding Author. Ph.D. in Social Science with a specialization in Sociology. El Colegio de México. Professor-Researcher at El Colegio de la Frontera Norte, Unidad Nogales
Email Address: hgarcia@colef.mx ORCID: https://orcid.org/0000-0003-3258-5026

[2] Ph.D. in Economic Sciences. Professor-Researcher at Universidad Autónoma Metropolitana-Cuajimalpa
Email Address: bgandl@cua.uam.mx ORCID: https://orcid.org/0000-0002-9526-0088

[3] Ph.D. in Social Science with a specialization in Sociology. Associate Researcher "C" at El Colegio de la Frontera Sur. Focus on socio-environmental studies and territorial management
Email Address: czamora@ecosur.mx ORCID: https://orcid.org/0000-0003-4089-2659

Abstract

The objective of the study is to explore the relationship between coffee production and the migration of seasonal laborers, using a comparative governance approach to value chains. The research seeks to answer how these dynamics affect migrant workers in Costa Rica, Honduras, and Mexico, areas that attract labor force.

Based on an exploratory study for the IOM and IICA in 2021, the methodology included case studies in selected regions. 50 semi-structured interviews were conducted with producers, migrant workers, and authorities, and the data were analyzed through thematic coding from the fieldwork findings. The results show that institutional governance significantly influences labor conditions and migration patterns.

The research concludes that strengthening institutional frameworks is necessary to ensure fair labor practices and an equitable distribution of benefits in the coffee value chain. Furthermore, it is recommended to strengthen labor agreements and promote the sustainability of the coffee sector to improve the well-being of migrant workers.

Keywords: Agricultural markets, Labor migration, Coffee industry, and Labor mobility.

JEL Code: J61, Q13

Resumen

El objetivo del estudio es explorar la relación entre la producción de café y la migración de trabajadores jornaleros, utilizando un enfoque comparativo de gobernanza de las cadenas de valor. La investigación busca responder cómo estas dinámicas afectan a los trabajadores migrantes en Costa Rica, Honduras y México, zonas de atracción de fuerza de trabajo.

Basado en un estudio exploratorio para la OIM y el IICA en 2021, la metodología incluyó estudios de caso en regiones seleccionadas. Se realizaron 50 entrevistas semiestructuradas con productores, trabajadores migrantes y autoridades, y los datos fueron analizados mediante codificación temática a partir de los hallazgos del trabajo de campo. Los resultados muestran que la gobernanza institucional influye significativamente en las condiciones laborales y los patrones migratorios.

La investigación concluye que es necesario fortalecer los marcos institucionales para asegurar prácticas laborales justas y una distribución equitativa de los

beneficios en la cadena de valor del café. Asimismo, se recomienda fortalecer los acuerdos laborales y promover la sostenibilidad del sector cafetalero para mejorar el bienestar de los trabajadores migrantes.

Palabras Clave: Mercados agrícolas, Migración laboral, Industria del café y Movilidad laboral.

Código JEL: J61, Q13

1.Introduction

Coffee is an economic and social pillar in the Mesoamerican region, being essential for the subsistence of numerous rural communities and providing employment to migrant workers who depend on this crop. Although the global coffee market value has grown in recent decades, the proportion of income that reaches producers in developing countries has decreased. While demand and coffee prices increase in international markets, the actors involved in distribution and marketing in developed countries benefit more, capturing a large part of the added value through marketing strategies, brands, and quality, without these benefits reaching the farmers (ICO, 2021).

On the other hand, producers in coffee-growing regions face challenges such as price volatility, climate change, increasing pests and diseases, trade barriers, and rising violence in their territories due to organized crime. The lack of access to financing and technology, along with weak governance, limits their ability to improve productivity and capture more added value. This creates a paradox: although coffee is more popular than ever, farmers face growing risks and do not fully benefit from the global coffee boom. This situation highlights the need to reassess coffee value chains and promote more balanced business practices.

Initiatives such as fair trade seek to ensure higher incomes for producers and foster sustainable conditions. However, the barriers to participate in these schemes are high, and much work remains to ensure that the benefits are equitably distributed along the chain. Additionally, the unequal distribution of benefits has generated specific migratory patterns: migrant workers move seasonally to higher production areas, such as Honduras, Costa Rica, and Mexico, for the harvest season, often facing precarious working conditions (OIM, 2023).

Regulatory frameworks regarding labor conditions in the coffee sector and migration flows vary significantly between countries. Although international agreements exist, such as the International Convention on the Protection of the Rights of Migrant Workers, their implementation at the national level is uneven. Another major challenge is the fragmentation and informality of production units, which limits oversight and regulation. The downward dynamics of the coffee value chain, where many farmers operate with reduced margins, result in low wages and poor working conditions for workers (OIM, 2023).

The link between the coffee value chain and labor conditions is complex. Although consumers in developed countries demand ethical and sustainable coffee, the lack of transparency in the value chain makes it difficult for regulators and consumers to influence labor conditions in producing countries. Understanding the interactions between the coffee value chain and labor conditions, especially for migrant workers, is key to improving migration management and ensuring sustainable coffee production, including fair labor practices.

To address these challenges, it is crucial to foster collaboration between governments, the coffee industry, and labor organizations. Only in this way can more equitable and sustainable labor practices be developed that benefit both producers and migrant workers. A more coordinated approach would ensure that coffee is grown sustainably, not only environmentally but also socially.

The objective of this paper is to analyze the relationship between coffee production and migrant labor flows in the labor force attraction areas, based on which public policies are proposed to improve the management of migrant populations. The empirical information presented is based on data generated from the project "Management of Migrant Workers in the Coffee Sector in Mexico, Honduras, and Costa Rica," conducted between May 2020 and December 2021 for the International Organization for Migration (IOM) and the Inter-American Institute for Cooperation on Agriculture (IICA) (OIM, 2023).

The paper is structured with this introduction and four additional sections. In the first section, a theoretical-conceptual model is proposed that links the production dynamics and migratory movements from a comparative institutional analysis approach of value chain governance. The

second section provides a more detailed description of the methodology used to obtain the results, while the third section describes the research results and discusses the main findings in relation to existing literature. In conclusion, the main public policy proposals and future research directions are presented.

2.Conceptual Framework

2.1 Governance of Value Chains as Interconnected Social and Institutional Systems with Migration

The coffee sector in the Mesoamerican region, understood as a social production system, faces various challenges and opportunities from an institutional perspective. To improve value chain governance and raise the incomes of producers, it is necessary to strengthen the institutions that regulate, coordinate, and guide decisions through formal and informal social rule systems. This approach seeks not only to transform individual actors but also to restructure the production system, integrated into regional and global value chains. By studying this context, we can understand the stagnation of producers' incomes and their difficulties in moving up the value chains (Arslan, 2020).

institutions, as systems of formal and informal rules, are essential for codifying relevant information and improving efficiency in agricultural systems, including coffee. Coordination among participants, productivity stimulation, and the optimization of exchange processes are linked to specific institutional frameworks (Wilson, 2010). Therefore, analyzing the governance of markets, entities, and public policies is crucial to understanding how value is distributed within these chains (Gelo et al., 2020). Previous studies, such as those by Granovetter (2018) and Ostrom et al. (2003), have highlighted the importance of social networks and social capital in the governance of productive systems.

Governance systems also manifest in collaborative social relations that can reduce transaction costs, facilitating credit, purchase-sale contracts, and shared investments in cooperatives and productive alliances (Arana-Coronado et al., 2019; Shumeta et al., 2016; Minten et al., 2017). However, it is important to analyze the structural peculiarities of global value chains and the role of key actors in the distribution of coffee, who have privileged access to information and essential mechanisms (Gereffi, 2018).

The success of coffee production systems at the local level depends on their degree of integration into global value chains, as well as the producers' ability to optimize the collective use of capital and resources. These factors, in turn, are linked to labor demand and migratory trends. In this context, value chain governance not only affects the management of the production system but also the regulation of the labor market and migration (Arslan, 2020).

he literature has highlighted the role of institutions, both formal and informal, in the governance of agricultural markets, as shown in studies on cooperatives and informal agricultural markets (Arayesh, 2011; Barraud-Didier et al., 2012; Winter-Nelson, 2005). When markets lack an adequate structure, producers face difficulties integrating into the agricultural sector, which complicates formal and informal interactions between them (Renkow et al., 2004).

A crucial element in the governance of production systems is the management of labor relations, which includes recruitment strategies and the hiring of day laborers (Ortiz, 1999; Posadas, 2018). Progress in production and value creation in the coffee sector is linked to the integration of producers into global value chains and their ability to adapt to uncertain factors such as price fluctuations or climate change (Arslan, 2020).

The structure of value chains, the organization of producers into cooperatives, and the presence of collective support programs are key elements to assess the quality of governance (Gandlgruber y García, 2014). These variables also influence the integration of production systems and their relationship with transnational migratory flows. Migratory patterns are interconnected with fluctuations in value generation, which affects both the need for local labor and the migration of workers to other regions (Nawyn, 2016).

Understanding the analysis of global value chains linked to the study of migratory flows, particularly circular and multi-local flows, provides an innovative perspective on South-South migration and its connection to global production systems (Nawyn, 2016; Velázquez et al., 2023).

2.2 Characterization of Governance in the Value Chain Links in the Region: Asymmetries, Disarticulation, and Productive Downgrading

A fundamental description of the coffee production system at the regional and local levels in Mesoamerica facilitates the geographic identification of the study units and establishes an initial group of key factors. In recent decades, coffee has experienced a significant increase in global demand, reaching nearly 165 million 60 kg sacks of coffee per year in 2021, equivalent to 2.25 billion cups of coffee per day (ICO 2021). Additionally, diversification and specialization in consumption has contributed substantial added value to the product.

Despite significant price fluctuations in the coffee bean, sellers have experienced a substantial increase in their income that far exceeds the quantitative growth of consumption. Given that the top ten coffee producers belong to low or middle-income economies (led by Brazil, Vietnam, and Colombia), this trend suggests promising opportunities for economies in the Global South. Specifically, for several Latin American countries, coffee remains a key product in their trade balances and in generating income for families. Of the ten leading exporters of raw coffee, five are Latin American nations: Brazil, Colombia, Honduras, and Mexico (see Table 1).

Table 1. Total Coffee Production (in thousands of 60kg sacks) Sacks and percentages of the global market, 2008 and 2020.

Countries	2008/09	%	2019/20	%
Brazil	51,491	38.2	58,211	35.3
Vietnam	18,438	13.7	30,487	18.5
Colombia	8,664	6.4	14,100	8.5
Total %	78,593	58.3	102,798	62.3
Indonesia	9,612	7.1	11,433	6.9
Ethiopia	4,949	3.7	7,342	4.4
Honduras	3,450	2.6	5,931	3.6
India	4,072	3	4,988	3
Uganda	3,335	2.5	5,509	3.3
Mexico	4,651	3.5	3,985	2.4
Peru	3,872	2.9	3,836	2.3
Total	134,800	65.4	165,053	69.2

Source: Moreira et al. (2023) based on the UN Comtrade Database

However, green coffee producers have had a limited share of the additional income derived from the global coffee market (see Table 2). These revenues have been primarily concentrated in the final stages of the value chain, especially in various forms of marketing aimed at final consumption. The share of grain producers in the total value has decreased considerably, as processed coffee export markets are controlled by Nordic countries such as Switzerland, Germany, and Italy. This inequality has notably increased in recent years due to the restructuring of the coffee market following its liberalization in the 1990s.

Table 2. Processed Coffee Exports (in billions of dollars) World Market Share, 2008 and 2020

Countries	2008/09	%	2019/20	%
Switzerland	0.8	12.8	2.8	23.1
Germany	1.4	23.6	2	16.5
Italy	0.9	15.9	1.7	13.4
Total %	3.1	52.4	6.5	53.1
France	0.2	3.6	1.4	11.2
Netherlands	0.3	4.6	0.7	5.8
United States	0.5	8.9	0.6	5.2
Canada	0.2	1.8	0.5	3.7
Poland	0.1	1.8	0.3	2.8
Great Britain	0.1	1.3	0.3	2.4
Spain	0.1	2.2	0.2	2
Total	4.6	77.5	10.4	86.2

Source: Moreira et al. (2023) based on the UN Comtrade Database

The marked increase in the global value of coffee (with a 60% increase since 1990) has been predominant in the processing and marketing stages, areas dominated by Northern countries, especially those where major food corporations are located. While the value (in real prices) generated in producing countries has remained stagnant, in distributing countries it has experienced multiplicative growth.

This evolution has blurred the traditional distinction between countries that are primarily exporters or producers and those that are importers or consumers. However, the export of green coffee (classified as "Colombian mild," "other milds," "Brazilian natural," and "robustas") is still dominated by historical producing countries. On the other hand, the marketing of processed coffee (such as roasted, ground, and soluble coffee), which represents the segments with the highest added value in the chain, has passed into the hands of large corporations in the countries that import coffee beans.

This has led to a situation where, despite the sustained growth in the coffee export market, large processing companies are capitalizing on the domestic market, even within coffee-producing countries. This has led to the formation of more diversified and

geographically dispersed value chains (OIC, 2021, p. 2). More recently, in the last decade, a market distinct from traditional commodities has emerged: the specialty coffee market. This market offers higher export prices but demands compliance with specific standards for environmental sustainability, processes, and labor conditions (e.g., the use of certifications or seals such as Fair Trade, Rainforest Alliance, UTZ Certified, 4C, Coffee Bird Friendly, JAS, among others).

The globalizing perspective of value chains, which anticipated growing benefits for all participants in the global chain as a result of integration and liberalization processes, does not align with the observed realities. This is due to intrinsic issues within the structures of the chains and their respective forms of governance.

In this sense, not only are the absolute levels of production relevant, influenced by geographic factors and productive skills, but primarily the potential of the producer units to generate value in each segment of the production system. This has impacts on the decline in labor demand, as it has decreased due to factors such as falling international prices, droughts, and pests like coffee leaf rust; primarily affecting Central America before the pandemic (ICO 2021).

In this context, the interaction of elements such as the diffusion of knowledge, the lack of effective links between parts of the chains, penetration into international markets, both tariff and non-tariff barriers, and the controversial role of foreign direct investments from multinational corporations (reflected in the "dominance costs" Lebdioui et al. 2021) are determinants of the economic functioning of production units in the global value chain. This, consequently, has a profound impact on the regional dynamics of labor mobility.

3.Methodology

The methodological process of the study was developed in four main stages. First, the selection of countries and territories was based on the identification of migratory flows of workers during the coffee harvest season in Mexico and Central America. The specific territories selected were: 1) the regions of Los Santos, Pérez Zeledón, and San Vito de Coto Brus in Costa Rica, considering the migration from the Ngäbe-Buglé region; 2) Copán, Ocotepeque, Marcala, Camasca, and Colomoncagua in Honduras; and 3) Chiapas in Mexico, specifically in the regions of Soconusco and Sierra Madre, covering border municipalities such as Tapachula, Unión Juárez, Huixtla, Motozintla, Siltepec, and Amatenango de la Frontera. This selection was made based on a study carried out by the authors for the International Organization for Migration (IOM) and the Inter-American Institute for Cooperation on Agriculture (IICA) en 2021.

For the collection of secondary data, an exhaustive search was carried out in academic publications, documents from international organizations and research centers, as well as international and national regulations, in addition to documents on programs, policies, or public plans from the participating countries. The search for information was conducted following specific criteria, which included regulations on the management of migrant workers, the productive dynamics of the coffee sector in the selected countries, and migratory flows in the studied territories. Additionally, an actor mapping was conducted to identify key informants in the governmental, private, and civil society sectors, including institutions and individuals involved in the coffee sector's dynamics and in managing migrant workers in the coffee sector.

Primary data collection was carried out through 50 in-depth interviews, both remote and in-person, with key informants from the governmental, civil society, and private sectors. These interviews included representatives from coffee support institutes, entrepreneurs, cooperatives, and producers' organizations in Costa Rica, Honduras, and Mexico. Experts in coffee and representatives from international organizations dedicated to the study of coffee were also consulted. The interviews were structured around themes such as coffee institutionalization, the productive and market dynamics in the coffee value chain, territorial migratory dynamics, recruitment practices in the migrant labor market, and the estimation of migrant labor supply and demand. These interviews helped document the coffee sector's dynamics and the mechanisms used by coffee organizations to estimate the demand for migrant workers in relation to the sector's productive dynamics.

The data were analyzed through thematic coding to identify recurring patterns and significant

relationships between coffee production and labor migration. The thematic coding was structured based on the fieldwork findings, following these themes: migratory flows in coffee-producing regions, recruitment conditions for migrant populations, participation of government bodies linked to labor and migration. The information analysis was conducted using the triangulation technique, which allowed for validating the information obtained in the interviews and contrasting it with the available literature on migration in coffee production and the theoretical framework constructed in this study. This technique not only allowed the identification of migratory dynamics related to coffee harvests in the selected regions but also analyzed different aspects of recruitment practices as the basis for migrant labor demand dynamics in the coffee sector, along with other governance aspects of these value chain segments.

Finally, several limitations of the study are recognized. First, the exploratory research, initially planned for all of Central America and Mexico, focused only on selected areas due to the vastness and diversity of the production system. As fieldwork progressed, Costa Rica, Honduras, and Mexico were identified as the main recipients of migrant labor related to the coffee harvest. However, a deeper investigation into these three countries and their selected territories would require additional human, financial, and logistical resources.

Second, social distancing measures due to the COVID-19 pandemic made fieldwork difficult and hindered in-person meetings with some key actors. In rural and border areas, limitations in internet communication quality and the use of technology for organizing virtual conversations further complicated access. This may have resulted in more complete data collection in some countries than in others.

Another limitation was the issuance of health alerts on the Mexico-Guatemala border during the fieldwork, which prevented direct contact with producers' organizations. In Costa Rica, fieldwork was conducted in the regions of Los Santos, Pérez Zeledón, and San Vito de Coto Brus, while in Honduras, several field visits were made, taking advantage of the presence of local researchers in the coffee-growing areas.

Finally, no official statistical data was found on the flow of migrant workers linked to coffee production in the countries studied. This is partly because the migration-labor-coffee relationship shows differentiated levels of interinstitutional collaboration. In Mexico, the coffee sector has undergone significant changes, making information or knowledge about this interdisciplinary, interinstitutional, and intersectoral phenomenon fragmented. For example, it refers to the diversification of migrant worker profiles and the sequences of their movements (OIM 2022). In Honduras and Mexico, it was common to find independent views on migration, labor, and coffee production, but not an integrated approach (IOM, 2022). In contrast, in Costa Rica, there are coordination efforts between the labor, migration, health, and productive sectors; in this case, it was possible to find quantitative estimates based on a local methodology.

4.Results and discussion

4.1 Relationship between Production Dynamics and Migratory Flows of Seasonal Workers

In the Mesoamerican region, Honduras is the main coffee producer, contributing 32% of the total production, although it ranks third in planted area with 19%. Mexico, the second-largest producer with 21%, leads in cultivated area with 37% of the total. Guatemala, with 19% of the production, is the second country with the largest cultivated area (20%). Nicaragua contributes 15% of the production and 9% of the planted area, while Costa Rica, El Salvador, and Panama represent 8%, 4%, and 1% of the production, and 5%, 8%, and 1% of the area, respectively (OIC, 2021).

Despite its significant extension, Mexico and El Salvador present the lowest productivity due to the age of plantations and the lack of proper agronomic management. The mixing of varieties and the use of plants vulnerable to coffee rust have decreased resilience and production levels, especially among small producers (Solorzano et al., 2021). In addition, factors such as pests, diseases, extreme weather events, and the COVID-19 pandemic have significantly affected productivity and sector stability.

Despite the rising global demand for coffee and its socioeconomic importance in the region, the constant fluctuation of international prices directly impacts the income stability of coffee producers.

These, in turn, face fixed production costs that must be covered, regardless of market dynamics.

From this perspective, coffee's ability to serve as an economic source for rural families is compromised due to decreased income and increased production costs. This directly impacts the concentration of coffee production in medium and large producers, who exert considerable influence over recruitment methods and labor compensation during the harvest. This trend leads to the consolidation of a few regions as poles of attraction for migrant labor and to wage precarization, implemented as a strategy to sustain fixed costs and deal with price fluctuations.

Costa Rica, Honduras, and Mexico, as the main destinations for migrant workers, tend to concentrate vast cultivation areas in the hands of productive organizations with extensions larger than five hectares. These areas are usually located in migratory corridors, where family and friendship networks play a crucial role in connecting from border areas, as reported by the OIM (2021b).

According to the IICA and based on the opinions of experts from national coffee, agriculture, and migration institutions, as well as from prominent coffee producer organizations, it has been validated that Guatemala, El Salvador, Nicaragua, and Panama employ national coffee pickers. Mexico benefits from the arrival of workers from Guatemala; Honduras receives workers from Nicaragua, El Salvador, and Guatemala; while Costa Rica hosts migrant workers from Nicaragua and Panama.

Labor mobilization in these three countries is mainly concentrated between October and April. Without a statistical systematization criterion, Costa Rica's ICAFE reported a need for 75,000 pickers for the 2020-2021 harvest (ICAFE 2021); while in Honduras, coffee authorities estimated a demand for at least 350,000 pickers for the same period (IHCAFE 2020). In the case of Mexico, no national estimate is available on the number of workers required for this task.

In Costa Rica, the regions that attract the most migrant workers in the coffee sector are those with significant coffee production over the last four years. Los Santos leads with 40% of national production, followed by the Western Valley (20%), the Central Valley (14%), Pérez Zeledón (12%), and Coto Brus (8%) (ICAFE, 2021). The influx of workers from Nicaragua to Costa Rica is mainly due to the Costa Rican labor market's ability to integrate foreign workers, the wage difference offering better opportunities, and the historical personal and cultural connections between both countries, such as family reunification. These ties have been strengthened in response to socioeconomic, political, and natural events affecting Nicaragua (National Migration Council, 2013). Meanwhile, migration from Panama to Costa Rica is driven by factors such as the lack of economic opportunities in the areas of origin, poverty, and insecurity. Specifically, the indigenous Ngäbe-Buglé group often migrates as complete family units, unlike Nicaraguans who tend to migrate individually (Olguín, 2006). See Scheme 1.

In Honduras, it is estimated that around 75% of the labor force for the coffee harvest comes from Guatemala (IHCAFE, 2020). The Copán region, in the western part of the country, is the main attraction for these migrant workers, mainly due to the high concentration of medium and large producers (IHCAFE, 2020). The influx of workers in this region is not only due to the need to cover a larger harvest but also to the favorable working conditions offered, which include a competitive salary, housing, and food. Additionally, an added incentive is that payment is made in Guatemalan quetzals instead of Honduran lempiras, maintaining a higher purchasing power due to the favorable exchange rate. On the other hand, in the eastern region of Honduras, coffee-growing areas near the border attract workers from both Nicaragua and El Salvador, although in smaller numbers in the case of the latter. These movements are driven by temporary employment opportunities during the coffee harvest season (OIT Visión Cero, 2020). See Scheme 2.

In the Soconusco region of Chiapas, a similar dynamic is observed regarding labor mobility in border areas between Mexico and Guatemala. Although pickers receive their wages in Mexican pesos instead of Guatemalan quetzales, the benefits in terms of savings on lodging and food offset the difference in the exchange rate. Additionally, the proximity to the Guatemalan border and the presence of medium and large-sized farms in Soconusco intensify the demand for migrant workers for coffee harvesting (Secretaría de Agricultura y Desarrollo Rural, 2021).See Scheme 3.

The implementation of border restrictions to mitigate the spread of the pandemic impacted the availability of migrant workers for the coffee harvest during the 2021–2022 cycle. Although movement to the main destination areas did not cease entirely, the quantity and quality of the labor force were seriously compromised. The COVID-19 pandemic caused delays in payments that producers and exporters received from their buyers, which deepened their vulnerability, given the need to make appropriate investments to ensure the sustainability of their production and reduce the risk of damage to their crops.

4.2 Institutional Arrangements in the Coffee Chain Related to Migration

The wage awarded as compensation in Costa Rica, Honduras, and Mexico is defined based on the amount a migrant worker harvests during their workday that is, it is piecework or "by the task." In Costa Rica, for example, migrant workers are paid based on the number of trunks they manage to collect, a unit of measurement certified by ICAFE. Meanwhile, the minimum wage is determined by the National Wage Council of the Ministry of Labor and Social Security (MTSS). Thus, the amount to be paid in Costa Rican colones is based on the number of trunks of coffee harvested in a day. According to testimony from those interviewed, on average, a picker can harvest around 11 trunks per day.

According to the interviewees, it is common practice for producers or employers to withhold a portion of the harvesters' wages, settling the full amount only at the end of the harvest season. This is done to ensure that workers do not leave their jobs before the cycle is completed. While this withholding can help workers save and avoid spending their entire wage, this form of payment contradicts the General Principles and Operational Guidelines for Fair Recruitment, and the definition of recruitment fees and related costs outlined in the Montreal Recommendations (IOM, 2020b). During interviews with producer organizations and other relevant informants, competition to attract known, efficient, and skilled workers was a recurring topic. It is not uncommon to find situations where companies or intermediaries offer higher pay per trunk to secure the hiring of such workers.

Scheme 1. Costa Rica: Migratory Dynamics in the Coffee Sector

Source: Cited in OIM, 2021

Scheme 2. Honduras: Migratory Dynamics in the Coffee Sector

Source: Cited in OIM, 2021

In Honduras, the payment method varies by region. In the western zone, the compensation method is based on the "lata," a unit of volume, whereas in the Marcala region, near the border with El Salvador, payment is based on the "quintal," a unit of weight. This distinction is crucial because it influences migrant pickers' decisions on where to work. Moreover, for coffee producers, this payment method can affect the quality of the coffee harvested.

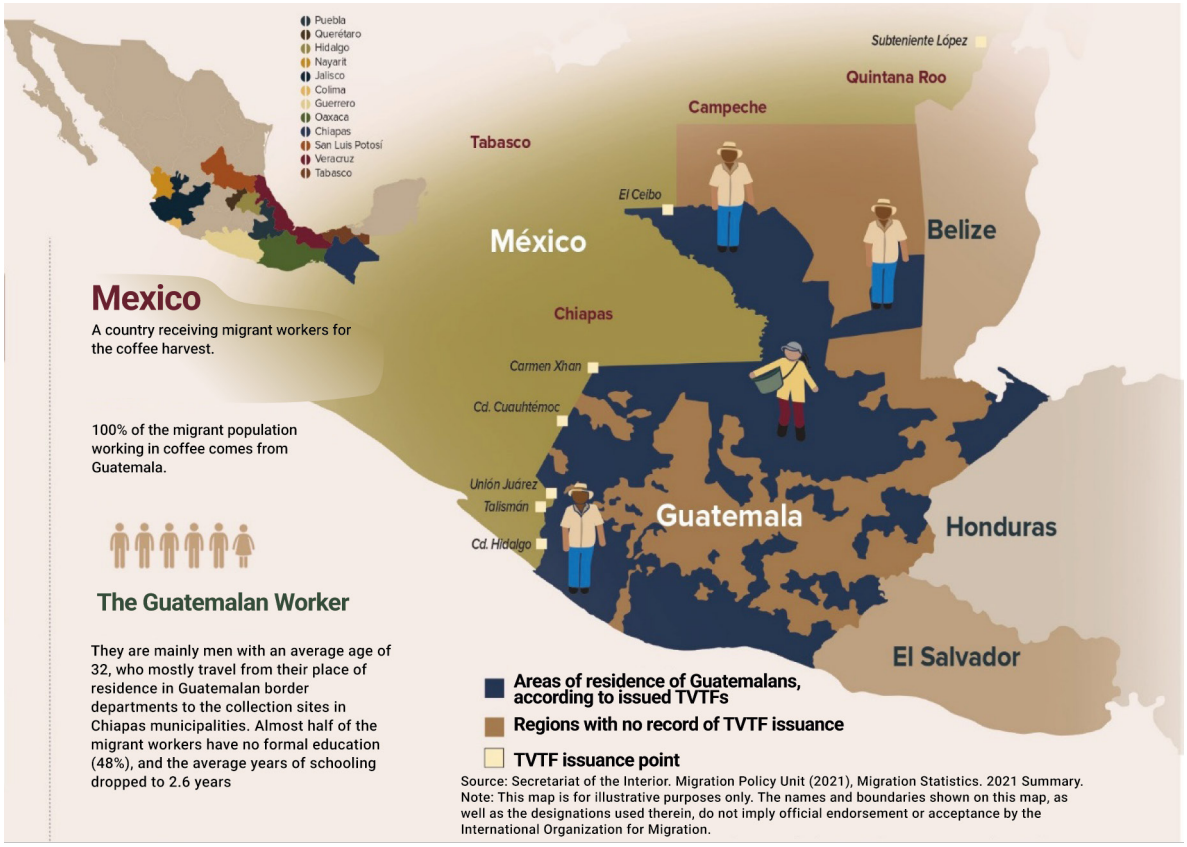
Unlike Costa Rica, which has an entity that certifies the unit of measurement and official rate to be paid to pickers, Honduras and Mexico lack a similar regulatory body. Nonetheless, in both countries, payment is linked to the volume or weight of the coffee harvested.

4.3 Migration Patterns Linked to the Transformation of Value Chains

One of the main findings of the study is that during the coffee harvest, Costa Rica, Honduras, and Mexico experience a significant influx of transnational migrant populations, mainly toward medium and large producers, in markets segmented by the migration of the local population to the United States. This has generated intra-regional migration flows: from Guatemala to Honduras and Mexico; from El Salvador, Guatemala, and Nicaragua to Honduras; and between Panama and Nicaragua to Costa Rica (see Schemes 1, 2, and 3). These movements intensify between October and March of each year, coinciding with the coffee harvest season.

The lack of an intra-regional institutional framework complicates the registration and monitoring of the migrant labor population through formal employment mechanisms. This situation fosters predominantly informal hiring strategies for migrant workers in Mexico, Honduras, and Costa Rica. In recent years, a

Scheme 3. Mexico: Migratory Dynamics of the Coffee Sector



Source: Cited in OIM, 2021

decline in the hiring of migrant populations has been reported in areas such as the Mexico-Guatemala border, because of increased violence related to organized crime and exchange rate parity that favors the Guatemalan quetzal over the Mexican peso. This situation has reduced the economic incentives for Guatemalans to work in Mexico, making it less profitable for them.

The management of the migrant labor population needed for coffee production relies mostly on verbal agreements, supported by social networks and bonds of trust built over the years. However, these arrangements lack a formal institutional or legal framework for conflict resolution in case of disputes. This dynamic exposes both parties to vulnerabilities. On one hand, workers have no guarantees that previously agreed-upon conditions regarding pay, benefits, and lodging will be honored once they arrive at the farms. On the other hand, informality can result in workers not fulfilling the agreed-upon workdays, leading to economic and time losses for farm owners.

Although it is valuable to acknowledge the initiatives of medium and large organizations within the coffee sector that aim to provide safe conditions and fair wages for temporary workers, it is essential to implement institutional mechanisms that formalize and regulate these labor relationships. This would allow a shift away from reliance on informal ties built up over multiple harvest seasons. In this context, it is relevant to consider the introduction of a "permanent temporary work permit" for those workers who return year after year to harvest in specific areas especially in Mexico and Costa Rica, where they are not governed by the CA-4 mobility protocols.

In summary, the study's findings show that labor migration in the coffee sector is influenced by factors such as value chain governance, working conditions, and production dynamics.

4.4 Discussion

The findings of this study align with previous research that has documented the relationship between value chain governance and labor migration. Studies such as those by Muradian and Pelupessy (2005) and Gereffi (2018) have pointed out how the governance of global value chains,

particularly in the agricultural sector, influences the distribution of benefits and the hiring of migrant labor. However, this study revealed important differences, especially regarding the widespread informality in the recruitment mechanisms for migrant workers and the lack of institutionalization of fair labor practices in some of the regions studied.

A distinctive aspect highlighted in this study is the persistence of informality in hiring migrant workers particularly in Mexico and Honduras where government regulation has not succeeded in establishing formal and transparent hiring mechanisms in the coffee sector. This informality results in unregulated labor agreements, lack of access to social benefits, and widely varying working conditions depending on the size of the farms and the region, a reality also emphasized in Wilson's 2010 study, as shown in the following interview excerpt:

"The National Migration Institute has always played with the idea of temporary or permanent immigration regulations. What happens is that people arrive at the Institute, at the Casa Roja located in Tecún Umán—which specializes in assisting border workers—with a job offer. This implies a recruitment logic where Mexican contractors go to the Guatemalan side and sell the recruitment; in other words, they charge you to take you. The Institute has a large proportion of people who are not granted the credential [border worker visitor card], while another group does receive it; that depends on whatever business the National Migration Institute has at the time. That's why you can find plantations where 70% of the workers have no credential at all—only 30% do. This shows there's a direct payment to the migration agent, who tells the farm owner to take the workers and just return them afterward, but there's no official record. This has become almost a tradition that has been happening historically."

(Interview with a civil society actor, 07/05/2021)

Unlike Costa Rica, where institutional frameworks governing migrant labor hiring in the coffee sector are more developed, in Honduras and Mexico practices largely depend on verbal agreements and informal social networks. This exposes workers to precarious conditions. These institutional differences highlight the need for stronger regulatory frameworks to ensure safer and more regulated migration management, as emphasized in the recommendations of the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (OIM, 2020b).

Another difference observed in comparison to previous studies is the influence of external factors, such as the COVID-19 pandemic, on migration flows and labor dynamics in the coffee sector. The pandemic exacerbated pre-existing vulnerabilities by restricting access to migrant labor and disrupting supply chains. This exposed the fragility of the sector in the face of unexpected changes, underlining the need for more resilient labor hiring mechanisms and institutional support, as suggested in the research of Arayesh (2011) and the IOM (2021a).

Additionally, the migration patterns observed in this study also reveal a greater complexity in transnational dynamics, where family and social networks play a crucial role in labor mobility. This aligns with the transmigratory perspective described by Pries (1998), which highlights how migrants establish links between their countries of origin and destination, forming networks that facilitate seasonal mobility. However, the study also reveals that these migration flows are not supported by integrated policies among the countries in the region, which limits the capacity to properly manage migrant labor.

For future research on this topic, it is essential to consider the impact of increasing violence in the region, particularly on the Mexican side of the Mexico-Guatemala border. The Mexican Association of the Coffee Production Chain (as cited in Gómez, 2024) has reported severe effects on coffee production and all actors involved, including approximately 170,000 producers, due to various forms of violence in Chiapas. According to estimates, the recent production cycle has seen losses of around 30% of income (Gómez, 2024). In some areas, more than 50% of the harvest has been lost due to the absence of Guatemalan day laborers, who have been unable to travel to the coffee-growing areas. Additionally, road checkpoints imposed by armed groups in the region have hindered the distribution of coffee to marketing centers. These consequences of violence exacerbate existing tensions stemming from governance problems in the coffee value chain and its links to climate change (Huber et

al., 2023). In this increasingly complex context, solutions aimed at comprehensive migration reform gain greater relevance, as they seek to establish and enforce clear standards for cross-border labor migration (Isacson, 2014).

In summary, this study confirms the relationship between value chain governance and transnational labor migration in the coffee sector, but also highlights the need to improve institutional frameworks that regulate the hiring and working conditions of migrant workers. Policy recommendations should focus on the formalization of labor agreements and the creation of institutional mechanisms that promote safer and more regulated migration.

5.Conclusions

The findings highlight the need for improved institutional frameworks to ensure fair labor practices and an equitable distribution of benefits along the coffee value chain. From the perspective of comparative institutional analysis of transnational value chains and migration in the coffee sector, a series of conclusions and proposals can be drawn.

First, it is shown that the formation processes of global value chains do not always generate benefits for all integrated actors, calling into question the objectives associated with trade liberalization, as they do not always produce higher levels of competitive advantage, as predicted by basic global value chain theory. These effects depend on the specific forms of governance that determine chain integration.

Second, there is a close link between the differentiated downgrading of the participation of Central American coffee-producing regions in global chains. The reduction in value generated by this sector in the region is the main cause of crop abandonment, which has led to various asymmetries and migration flows to meet local labor demand through transnational movements.

Third, the specific regional consequences vary. In some areas of Mexico, the reduction in value generation causes migration of producers to the North (push factor), who are in turn replaced by migrant day laborers from Guatemala and other parts of Central America, creating circular transnational migration phenomena.

Policy recommendations include improving labor agreements and supporting specific areas to enhance the sustainability of the coffee sector and the well-being of migrant workers. For the proper and structured management of labor mobility in the coffee sector, it is essential that migration, labor, social security, and coffee-related authorities establish closer partnerships with employers and coffee organizations. This will allow for better information sharing regarding migration regulations and the labor needs of the sector. The primary goal is to ensure the rights of the migrant labor force and to ensure that employers respect and comply with current labor and migration regulations.

In addition to implementing specific regulations for managing migrant workers in the coffee sector and improving infrastructure for efficiently processing temporary work applications, it is essential to develop concrete action programs. These should materialize the aspirations of international agreements and the goals of governmental entities seeking to provide adequate policy responses to the coffee sector. It is crucial to recognize and value the significant contribution that the international migrant labor force makes to coffee harvesting in countries such as Costa Rica, Honduras, and Mexico. Within the framework of migration policy recommendations, and in order to provide better wage conditions for migrant workers (based on the piece-rate payment system), it is imperative to enhance the productivity of the coffee sector in two main ways: 1) Provide technical assistance to ensure the health of coffee plants, minimizing vulnerability to pests such as coffee leaf rust and guaranteeing a higher-quality bean at harvest time, 2) Facilitate marketing support to reduce the volatility of international prices. This can be achieved by consolidating producer organizations such as associations and cooperatives and by implementing guaranteed prices set by coffee regulatory entities. Additionally, it is essential to promote the acquisition of certifications or distinctive seals that can open the doors to specialized market niches.

It is essential to emphasize that these strategies are crucial for countering the trend among small-scale farmers who make up the majority of the sector of abandoning their plantations. Furthermore, by improving conditions within the coffee sector, it becomes more likely that younger populations will choose to remain in their places of origin and dedicate themselves to coffee cultivation, rather

than migrating in search of better opportunities, such as to the United States.

Finally, given the pressing need to enhance the exchange of experiences among the countries analyzed in this study, it is essential for immigration authorities to become involved in high-level political dialogue through programs associated with the coffee sector in each member country of the Central American Agricultural Council (CAC). In this direction, it is pertinent to strengthen coffee-related institutions in the Mesoamerican region such as the Regional Cooperative Program for the Technological Development and Modernization of Coffee Cultivation (PROMECAFE) or any regional coffee strategy through the implementation of a specific program that addresses the interrelationship between the international migrant labor force and the coffee sector.

References

Allen, D. W., & Lueck, D. (2005). Agricultural contracts. En C. Ménard & M. M. Shirley (Eds.), *Handbook of new institutional economics* (pp. 465-490). Springer.

Arana-Coronado, J. J., Trejo-Pech, C. O., Velandia, M., & Peralta-Jimenez, J. (2019). Factors influencing organic and fair trade coffee growers level of engagement with cooperatives: The case of coffee farmers in Mexico. *Journal of International Food & Agribusiness Marketing, 31*(1), 22-51.

Arayesh, B. (2011). Identifying the factors affecting the participation of agricultural cooperatives' members. *American Journal of Agricultural and Biological Sciences, 6*(4), 560-566.

Arslan, C. (2020). *Essays on agricultural technology adoption, value chain development, and intra-household decision-making* [Tesis doctoral, Georg-August-Universität Göttingen].

Barraud-Didier, V., Henninger, M. C., & Akremi, A. (2012). The relationship between members' trust and participation in the governance of cooperatives: The role of organizational commitment. *International Food and Agribusiness Management Review, 15*(1), 1-24.

BBC. (2019). Cómo te puede afectar la crisis mundial del café (y por qué está detrás de la oleada migratoria de Centroamérica). *BBC Mundo*. https://www.bbc.com/mundo/noticias-décosse48966545

Beckmann, V., & Padmanabhan, M. (Eds.). (2009). *Institutions and sustainability: Political economy of agriculture and the environment - Essays in honour of Konrad Hagedorn*. Springer Science & Business Media.

Carbajal, E., Rivera, J., Ramos, E., & Raymundo, C. (2020). Strategic sourcing toward a sustainable organic coffee supply chain: A research applied in Cuzco. En I. Kantola, T. Barath, & S. Nazir (Eds.), *International Conference on Human Systems Engineering and Design: Future Trends and Applications* (pp. 929-935). Springer.

Comisión Económica para América Latina y el Caribe (CEPAL). (2019a). *Desarrollo y migración: desafíos y oportunidades en los países del norte de Centroamérica* (LC/MEX/TS.2019/7).

Comisión Económica para América Latina y el Caribe (CEPAL). (2019b). *Desarrollo y migración: Desafío y oportunidades en los países del norte de Centroamérica*. https://www.repositorio.cepal.org/bitstream/handle/11362/44649/1/S1000454_es.pdf

Fitter, R., & Kaplinksy, R. (2001). Who gains from product rents as the coffee market becomes more differentiated? A value-chain analysis. *IDS Bulletin, 32*(3), 69-82.

Gathura, M. N. (2013). Factors affecting small-scale coffee production in Githunguri District, Kenya. *International Journal of Academic Research in Business and Social Sciences, 3*(9), 132–149.

Gelaw, F., Speelman, S., & Van Huylenbroeck, G. (2016). Farmer's marketing preferences in local coffee markets: Evidence from a choice experiment in Ethiopia. *Food Policy, 61*, 92-102.

Gelo, D., Muchapondwa, E., Shimeles, A., & Dikgang, J. (2020). Aid, collective action and benefits to smallholders: Evaluating the World Food Program's purchase for progress pilot. *Food Policy, 97*, 101911.

Gereffi, G. (2018). *Global value chains and development: Redefining the contours of 21st century capitalism*. Cambridge University Press.

Global Migration Data Portal (GMDP). (2021). Estadísticas de migración. https://www.migrationdataportal.org/international-data?i=stock_abs_&t=2020&cm49=484

Gómez, A. (2024). Violencia en Chiapas causa pérdidas millonarias a productores de café. Diario del Sur. https://www.diariodelsur.com.mx/local/violencia-en-chiapas-causa-perdidas-millonarias-a-productores-de-cafe-12738800.html

Granovetter, M. (2018). Economic action and social structure: The problem of embeddedness. En M. Granovetter & R. Swedberg (Eds.), *The sociology of economic life* (pp. 22-45). Routledge.

Huber, J., Madurga-Lopez, I., Murray, U., McKeown, P. C., Pacillo, G., Laderach, P., & Spillane, C. (2023). Climate-related migration and the climate-security-migration

nexus in the Central American Dry Corridor. *Climatic Change, 176*(6), 79.

ICO (International Coffee Organization). (2021). *Coffee development report 2020*.

Instituto del Café de Costa Rica (ICAFE). (2021). *Informe de Rendición de Cuentas. Gestión de Mano de Obra Migrante Cosecha 2020-2021. Café de Costa Rica: "Nuestras acciones de cara a la crisis"*.

Isacson, A., Meyer, M., & Morales, G. (2014). *Mexico's other border: Security, migration, and the humanitarian crisis at the line with Central America* [Reporte]. Washington Office on Latin America.

Kherallah, M., & Kirsten, F. J. (2012). The new institutional economics: Applications for agricultural policy research in developing countries. *Agrekon, 41*(2), 110-133.

Lebdioui, A., Lee, K., & Pietrobelli, C. (2021). Local-foreign technology interface, resource-based development, and industrial policy: How Chile and Malaysia are escaping the middle-income trap. *The Journal of Technology Transfer, 46*, 660-685.

Mai, T. C., Shakur, S., & Cassells, S. (2018). Testing vertical price transmission for Vietnam's Robusta coffee. *Australian Journal of Agricultural and Resource Economics, 62*(4), 563-575.

Minten, B., Assefa, T., & Hirvonen, K. (2017). Do coffee cooperatives benefit farmers? An exploration of heterogeneous impact of coffee cooperative membership in Southwest Ethiopia. *Journal of Rural Studies, 50*, 84-94.

Mojo, D., Fischer, C., & Degefa, T. (2017). The determinants and economic impacts of membership in coffee farmer cooperatives: Recent evidence from rural Ethiopia. *Journal of Rural Studies, 50*, 84-94.

Muradian, R., & Pelupessy, W. (2005). Governing the coffee chain: The role of voluntary regulatory systems. *World Development, 33*(12), 2029-2044.

Organización Internacional para las Migraciones (OIM). (2021). *Perfiles Sociolaborales del Trabajo Transfronterizo en los Sectores Agrícola y No-Agrícola*.

Velázquez-Salazar, M., & Lizama Gaitán, G. S. (2023). Global Value Chains in the Coffee Sector: A Comparative Analysis Between El Salvador and Mexico. En *Global Value Chains in Latin America: Experiences of Transformations* (pp. 137-162). Springer.

Villafuerte Solís, D., & García Aguilar, M. D. C. (2014). Tres ciclos migratorios en Chiapas: Interno, regional e internacional. *Migración y Desarrollo, 12*(22), 3-37.

Wilson, B. R. (2010). Indebted to Fair Trade? Coffee and crisis in Nicaragua. *Geoforum, 41*(1), 84-92.

Winter-Nelson, A., & Temu, A. (2005). Impacts of prices and transactions costs on input usage in a liberalizing economy: Evidence from Tanzanian coffee growers. *Agricultural Economics, 33*(3), 243-253.

Zheng, S., Wang, Z., & Awokuse, T. O. (2012). Determinants of producers' participation in agricultural cooperatives: Evidence from northern China. *Applied Economic Perspectives and Policy, 34*(1), 167-186.