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Editor's Letter

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Welcome to the latest edition of our journal, where we present a diverse array of research articles that delve into contemporary issues across various fields. This issue combines empirical studies and theoretical explorations illuminating different aspects of business, tourism, food preferences, and organizational culture. We aim to provide insightful analyses and foster a deeper understanding of these multifaceted topics.

The first article, Impact of the Supply Chain on Sustainable and Business Performance During the COVID-19 Pandemic, was written by Sandra Yesenia Pinzón Castro and Gonzalo Maldonado Guzman. In this empirical study, the authors assess how the supply chain influenced both sustainable and business performance during the COVID-19 pandemic. Through a meticulous analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study reveals a complex interplay in which the pandemic led to notable improvements in sustainable performance but also a decline in overall firm performance. This research underscores the need for more nuanced theoretical and empirical insights into how global disruptions impact supply chains and performance metrics.

The second article is Unveiling the Disruptive Force: Analyzing the Impact of Digital Shopping. Arumugam Deepa and Arthanari Elangovan wrote it. This article investigates the repercussions of digital shopping on traditional retail in Tamil Nadu. Utilizing quantitative methods and various statistical techniques, the authors find that digital shopping significantly affects the growth and profitability of offline retail. The study also explores socio-economic and psychological factors influencing consumer behavior, offering actionable recommendations for traditional retailers to adapt and thrive in the evolving market landscape.

Diego Salazar Duque & María Alejandra Osorio Espín wrote the third article: The Influence of Personality and Desires on Motivation for Selecting Tourist Destinations. Focusing on the tourism sector, this research examines how personality traits and desires shape the selection of travel destinations. A survey conducted in Quito revealed that while various factors, including personality traits, play a role in destination choice, they do not significantly mediate between tourism needs and offerings. This study provides valuable insights into the psychological and motivational dynamics influencing travel decisions.

The fourth paper is Determinants of Receptivity Towards Entomophagy Among Young Adults. Its authors are Carlos Francisco Ortiz Paniagua, Miguel Ángel Bautista Hernández

and Paulina Lerch López. This research explores the acceptance of entomophagy (insect eating) among young adults in Morelia, Michoacán, and highlights the factors driving dietary preferences in this demographic. The findings indicate that while traditional deterrents like price are insignificant, easy access to information about insect-based foods can positively influence acceptance. This study contributes to the broader discourse on alternative food sources and their potential in contemporary diets.

The fifth article is Knowledge Management and Human Resource Management to Innovate: An Empirical Analysis in the Textile Industry. Jaime Apolinar Martínez-Arroyo, María Francisca Peñaloza Talavera, Marco Alberto Valenzo Jiménez, and Flor Madrigal Moreno present this qualitative and descriptive study, which investigates how knowledge management and human resource management impact innovation within the textile industry in central-western Mexico. By applying Structural Equation Modeling (SEM), the authors validate significant relationships between these variables and innovation, bridging gaps in existing literature and providing practical insights for enhancing industry practices.

The final article, Massive Transformative Purpose (MTP) as Moderator in the Relationship Between Culture of Experimentation and Autonomy, explores the moderating effect of an organization's Massive Transformative Purpose (MTP) on the relationship between a culture of experimentation and autonomy in IT companies in Jalisco. Despite confirming a significant positive relationship between experimentation and autonomy, the study finds that the MTP does not significantly moderate this relationship, challenging initial hypotheses and contributing to the ongoing discussion about organizational culture and purpose. It was written by Antonio de Jesús Vizcaíno and Alfredo Aguilar Ruiz

We hope these articles spark meaningful discussions and provide valuable perspectives in their respective fields. We extend our gratitude to the authors for their rigorous research and contributions. We welcome feedback and encourage readers to engage with these studies to advance knowledge and practice.

Sincerely,
Dr. José Sánchez Gutiérrez
Editor

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Impact of the Supply Chain on Sustainable and Business Performance During the COVID-19 Pandemic

Impacto de la cadena de suministro en el desempeño empresarial y sostenible durante la pandemia de COVID-19

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ABSTRACT

The main objective of this empirical study is to provide empirical evidence that allows quantifying the impact of the supply chain on sustainable and firm performance during the COVID-19 pandemic. An electronic survey was applied to collect information on 65 manufacturing firms selected through simple random sampling, using the statistical technique of Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the data obtained using the SmartPLS 4.0 software. Furthermore, the analysis carried out in this study identifies a need for more theoretical and, above all, empirical evidence in this area, which prevents the generalization of the results obtained. Likewise, the results suggest that during the COVID-19 pandemic, the supply chain positively impacted sustainable performance. However, an adverse effect was also detected on firm performance, so it is possible to conclude that the COVID-10 pandemic substantially improved the sustainable performance of manufacturing companies. However, it also generated a decrease in their level of firm performance.

Keywords: Supply chain; COVID-19 pandemic; sustainable performance; firm performance.

JEL code: M21

RESUMEN

Este estudio empírico tiene como principal objetivo aportar evidencia empírica que permita cuantificar los efectos de la cadena de suministro en los rendimientos sustentable y empresarial durante de la pandemia del COVID-19. Se aplicó una encuesta electrónica para recolectar información de 65 empresas manufactureras seleccionadas mediante un muestreo aleatorio simple, utilizando la técnica estadística del Partial Least Squares Structural Equation Modelin (PLS-SEM) para el análisis de los datos obtenidos, mediante el uso del software SmartPLS 4.0. Además, el análisis realizado en este estudio identifica una falta de evidencia teórica y, sobre todo, empírica en esta área lo cual impide la generalización de los resultados obtenidos. Asimismo, los resultados obtenidos sugieren que durante la Pandemia del COVID-19 la cadena de suministro generó un impacto positivo en el rendimiento sustentable, pero también se detectó un impacto negativo en el rendimiento empresarial, por lo cual es posible concluir que durante la pandemia del COVID-19 se generó una mejora sustancial en el rendimiento sustentable de las empresas manufactureras, sin embargo, también generó una disminución en su nivel de rendimiento empresarial.

Palabras clave: Cadena de suministro; pandemia del COVID-19; rendimiento sustentable; rendimiento empresarial.

Código JEL: M21.

INTRODUCTION

During the COVID-19 pandemic, various adverse effects were generated in the global economy (Haraguchi *et al.*, 2023), particularly in the entire supply chain of manufacturing companies of all sizes and sectors (Ivanov & Dolgui, 2020b; Butt, 2021). However, the pandemic also helped manufacturing firms improve their skills and capabilities to mitigate risks in the supply chain (Haraguchi *et al.*, 2023). However, it is still not clear in the scientific, academic, and business communities how practical the response of manufacturing companies to quickly adapt to the changes generated during the COVID-19 pandemic (Renn *et al.*, 2022), which is why researchers and academics need to focus their studies on providing empirical evidence on the effects generated. During the COVID-19 pandemic, the supply chain and manufacturing companies' performance levels were high (Haraguchi *et al.*, 2023).

In this context, the disruption of the supply chain caused during the COVID-19 pandemic in manufacturing firms and its effects on firm performance has been little explored in the literature; the few studies have focused on the United States, China, Japan, and Thailand (Haraguchi *et al.*, 2023). Furthermore, published studies that have analyzed the breakdown of the supply chain in manufacturing firms during the COVID-19 pandemic have focused on a variety of sectors, for example, automotive and aeronautics (Belhadi *et al.*, 2020), fashion industry (McMaster *et al.*, 2020), and medical industry (Belhouideg, 2020). However, only some studies have addressed how supply chain disruption was used to manage risks during the COVID-19 pandemic (Chang *et al.*, 2022) and improve firm performance (Ivanov, 2020a).

During the COVID-19 pandemic, several negative impacts were generated on both businesses and supply chain, including a significant reduction in their efficiency and firm performance (Ivanov, 2020a; Guan *et al.*, 2020), as well as a disruption among companies participating in the supply chain, which generates adverse effects on sustainable and firm performance (Ivanov, 2020b; Ivanov & Dolgui, 2020a). In this sense, during the COVID-19 pandemic, diversified and dynamic negative impacts were generated on the entire global economy (Koonin, 2020; Haren & Simchi-Levi, 2020).

Proof of this is that the COVID-19 pandemic, according to the report published by Fortune Magazine in February 2020, long before the World Health Organization declared COVID-19 a global pandemic (March 21, 2020), had negatively impacted 94% of the 1,000 largest companies in the world, generating severe disruption in the management of their supply chains (Fortune, 2020).

Furthermore, the COVID-19 pandemic has negatively impacted both the sustainability of the supply chain and the companies that participate in the supply chain of most of the world's manufacturing industries, including the automotive sector (Gunessee & Subramanian, 2020; Paul & Chowdhury, 2020), which is causing an interruption in the flow and raw materials from the primary production and distribution centers to the production centers (Chowdhury *et al*., 2021). In addition to the multidimensional negative impacts generated in the supply chain, the COVID-19 pandemic is also negatively affecting the level of business performance and global trade (Donoth *et al.*, 2020); proof of this is that international trade is reduced by around 32% in 2020, derived from the economic crisis generated by COVID-19 pandemic (WTO, 2020).

Additionally, derived from the negative impacts of the COVID-19 pandemic on the supply chain of manufacturing firms, researchers, academics, and industry professionals consider that more empirical evidence should be provided on this topic (Chowdhury *et al.*, 2021) since the studies published in the current literature are scarce and the secondary effects generated by COVID-19 pandemic in the supply chain must be delved deeper (Chowdhury & Paul, 2020; Iyengar *et al.*, 2020). Thus, to provide empirical evidence, this study has as its research question: *What are the effects of the supply chain on the sustainable and firm performance of manufacturing firms in the automotive industry in Mexico during the COVID-19 pandemic?*

LITERATURE REVIEW

During the COVID-19 pandemic, various changes were generated in local and global supply chains, affecting their level of sustainable and firm performance, which caused companies to explore the adoption of more effective strategies to mitigate risks and improve their results (Aljuneidi *et al.*, 2023). Furthermore, during the COVID-19 pandemic, the supply chain was affected in different ways (Aljuneidi *et al.*, 2023), one of the main effects being the demand for essential products such as masks and disinfectants, which caused a shortage in the market for these products, as well as an increase in the costs of transporting the products (Mbah & Wasum, 2022), thereby generating an increase in sustainable performance and a decrease in firm performance (Ivanov, 2020a).

The attention paid to the effects of the COVID-19 pandemic on the supply chain of manufacturing companies is similar among researchers and industry professionals (e.g., Business Insider, 2020; Deloitte, 2020; Fortune, 2020), mainly because various reports indicate that a significant percentage of companies have had problems in their supply chain during the COVID-19 pandemic (Fortune, 2020). This unprecedented situation has caused a re-evaluation of the supply chain activities of manufacturing companies and the exploration

of innovative solutions to address the challenges (Aljuneidi *et al.,* 2023), as well as to improve sustainable and firm performance (Ivanov, 2020b; Ivanov & Dolgui, 2020b).

In this context, numerous studies have proposed different strategies to deal with the effects generated during the COVID-19 pandemic in manufacturing companies, including increasing production capacity, optimizing supply chain infrastructure, and exploring sustainable supply chain systems (e.g., Naz *et al.,* 2021; Nordhagen *et al.,* 2021; Paul & Chowdhury, 2021). However, in a recent study, Aljuneidi *et al.* (2023), through an extensive literature review, identified that of 393 papers found in the WoS and Scopus databases, only 52 (13%) analyzed the effects of the supply chain on sustainability during and after the pandemic, 40 used mathematical models, 12 were focused on the electronics and automotive industry. Five were carried out in Basil, the only country in Latin America.

SUPPLY CHAIN AND SUSTAINABLE PERFORMANCE DURING COVID-19 PANDEMIC

An essential characteristic of the COVID-19 pandemic is having plunged the supply chain into a crisis in the last five years, which was characterized by a transformation of production systems from insourcing to outsourcing, from local to global, and certainty to uncertainty in business (Ivanov, 2024). Furthermore, during the COVID-19 pandemic, supply chain management and its effects on business results were challenged, moving from order to chaos, from controllable or uncontrollable activities, from the rigid and fluid to the flexible and adaptable, and from the certain to the uncertain (Ivanov, 2024). Thus, during the COVID-19 pandemic, the supply chain of manufacturing companies was affected globally, thereby generating concern for researchers, academics, and professionals to know the extent of its effects on business results (Reza *et al.,* 2023).

In this sense, Sarkis (2020) found that even though manufacturing companies faced a shock during the COVID-19 pandemic, improving supply chain sustainability allowed organizations to overcome the economic crisis, which enables us to establish that the COVID-19 pandemic presents a broad opportunity for companies to generate and apply new ideas in the supply chain that significantly improve their sustainable performance (Nandi *et al.,* 2021). Furthermore, the need for society to preserve, regenerate, and restore natural resources (e.g., reforestation, water, recreation parks, climate, and air quality) are substantial elements that strongly impact the sustainable performance of manufacturing companies (Liu *et al.,* 2020).

Regarding the effects of the supply chain on the automotive industry during the COVID-19 pandemic, Chervenkova and Ivanov (2023) found that the pandemic drastically transformed

the automotive industry, negatively affecting its global networks in terms of severity, complexity, scale, and duration of the impact, but also allowed an improvement in its level of sustainable performance. Karamoozian *et al.* (2024) found that during the COVID-19 pandemic, the global automotive industry suffered severe disruptions that generated a domino effect, making it difficult to predict business results. However, companies developed contingency plans that effectively addressed the risks, allowing them to improve their sustainable performance.

Additionally, Mishrif and Khan (2023) found that the digitalization of the supply chain during the COVID-19 pandemic was what allowed for improving the sustainability of companies, while Marco-Ferreira *et al.* (2023) found that to mitigate the effects of the COVID-19 pandemic on the supply chain of manufacturing firms, organizations had to be more resilient and use a more sustainable business model. This is why manufacturing firms that have adopted and implemented sustainability activities in their supply chains not only did they significantly reduce the risks (Reza *et al.,* 2020; Choi, 2020) but also increase their level of sustainable performance by a high percentage (Ivanov, 2020b; Ivanov & Dolgui, 2020b).

Furthermore, theoretical and empirical evidence has been provided in the supply chain literature, establishing that sustainability not only improves supply chain activities but also significantly improves the sustainability of manufacturing firms (Kouhizadeh *et al.,* 2021). Likewise, recently, various sustainability activities have gained the attention of researchers, academics, and industry professionals, primarily when they are directly related to the supply chain of manufacturing firms since they are considered an essential element to improve innovation and avoid the breakdown of the supply chain in times of crisis generated by COVID-19 pandemic (Treiblmaier & Beck, 2020) since generally its attributes not only encourage the exchange of information and negotiation mechanisms but also improve firm sustainability performance (Saberi *et al.,* 2019). Thus, considering the information presented, it is possible to propose the following research hypothesis:

H1: The supply chain has positive effects on sustainable performance level

Supply Chain and Firm Performance during COVID-19 Pandemic

Most of the papers published in the literature that analyze the effects generated during the COVID-19 pandemic on the supply chain have used various methodologies, including surveys (e.g., Nikookar & Yanadori, 2022; Spieske *et al.,* 2022), secondary data (e.g. Mariappan *et al.,* 2022), and case studies (e.g. Acar *et al.,* 2022), and have generally focused on supply chain resilience and disruption (Guest Editorial, 2022). Few studies have analyzed the effects of the supply chain on firm performance (Ivanov, 2024). A possible cause of this phenomenon is that in most product purchases, consumers prefer to make them online and

through traditional distribution channels (Ivanov & Das, 2020), significantly reducing the supply chain and business performance (Siche, 2020).

In this sense, Reza *et al.* (2023) analyzed the effects during the CIVOD-19 pandemic on the prices of products that were purchased in person and online, finding a drop in personal purchases and a substantial increase in online purchases, thereby collapsing the supply chain, and reducing the level of firm performance. For their part, Seif *et al.* (2023) demonstrated that during the COVID-19 pandemic, the supply chains of food and essential personal hygiene products collapsed, which generated severe economic problems in manufacturing companies that manufactured non-basic products. A possible cause of this phenomenon is the panic generated among consumers due to the shortage of this type of product in conventional stores and traditional distribution channels globally (Hobbs, 2020; Richards & Rickard, 2020).

Likewise, non-essential products have significantly reduced their demand, mainly due to decreased consumer income, who prefer to save some economic resources to alleviate an uncertain future (Chiaramonti & Maniatis, 2020; Abhishek *et al.*, 2020). This decrease in purchasing levels is generating severe economic problems in various industries, including tourism, aerospace, and automotive, which are facing a severe crisis in their financial and firm performance (Majumdar *et al.*, 2020). Therefore, their billing levels create ambiguity and uncertainty in their supply chains, affecting decision-making (Gunessee & Subramanian, 2020) and increasing the prices of non-essential products (Farías & Araújo, 2020).

In a recent study, Sun *et al*. (2022) found that during the COVID-19 pandemic, a contraction was generated in the supply chain of electric vehicles, which caused a reduction in the level of firm performance, while Rajak *et al.* (2022) found that during the COVID-19 pandemic, the entire vehicle supply chain was severely affected, which generated a substantial decrease in sales and, as a consequence, a reduction in firm performance. Similar results were found by Spieske *et al.* (2022), who suggest that automotive industry companies should collaborate in exchanging knowledge, information, and learning to improve not only the entire supply chain but also the level of firm performance.

Additionally, the COVID-19 pandemic is causing a significant reduction in the production processes of manufacturing firms (Richards & Rickard, 2020), which is why the production capacity of companies has been dramatically reduced, also caused by the political decisions to reduce working hours so that employees maintain social distancing, and stagger workers' working days to prevent the spread of COVID-19 pandemic (Leite *et al.*, 2020). Likewise, social distancing and safety measures are decreasing production levels in manufacturing firms (Trautrims *et al.*, 2020), as well as limiting supply chain operations for all types of goods, resulting in both the obsolescence of machinery and equipment and the reduction in

firm performance (Dente & Hashimoto, 2020). Thus, considering the information presented, it is possible to propose the following research hypothesis:

H2: The supply chain has adverse effects on firm performance level

METHODOLOGY

To answer the research questions proposed in this paper, an empirical study was carried out in the manufacturing firms of the automotive industry in Mexico, using the business directory of the automotive industry in Mexico, which had a record of 900 companies as of May 30, 2020, these companies belonging to various business chambers and local, regional, and national organizations, which is why the empirical study did not focus on a particular business association. Likewise, an electronic survey was applied to collect information on 65 manufacturing firms selected through simple random sampling. This survey was applied during June and July 2020 by a private company dedicated to the investigation of markets.

Likewise, to measure the supply chain, an adaptation was made to the scale proposed by Marshall *et al.* (2014), who considered that the supply chain can be measured through 8 items. To measure sustainable performance, an adaptation was made to the scale proposed by Bansal (2005) and Chan (2005), who considered that sustainable performance could be measured through 6 items. An adaptation was made to the scale that Bag (2014) proposed, who thought this construct could be measured through 6 items to measure firm performance. Likewise, all items on the scales were measured through a five-point Likert-type scale, with 1 = Completely disagree to 5 = Completely agree as limits, since generally, these types of scales provide a balance appropriate between the complexity of the respondents and the ease of analysis of the information (Forza, 2016; Hair *et al.*, 2016).

In addition, the reliability and validity of the scales of the supply chain, sustainability, and business performances were measured through Cronbach's Alpha, Composite Reliability Index (CRI), and Extracted Variance Index (EVI), respectively, to assess its internal consistency (Hair *et al.*, 2019). Furthermore, the literature also establishes that the use of scales with various items can generate problems with content validity (Rossier, 2002) since they can artificially increase the correlations of the error terms (Drolet & Morrison, 2001; Hayduk & Littvay, 2012), which is why the use of measurement scales with few items is recommended. Table 1 shows the specific items used for each construct.

Table 1. Measurement Model Assessment

Indicators	Constructs	Factor loads (p-value)	Q^2
Supply Chain Composite Type A (SSC) Cronbach's alpha: 0.926; Dijkstra–Henseler's rho: 0.942; CRI: 0.939; EVI: 0.660			
SSC1	It constantly monitors its suppliers to ensure they comply with safety and hygiene requirements.	0.724 (0.000)	0.082
SSC2	Periodically apply questionnaires or surveys to your suppliers to monitor their correct application.	0.735 (0.000)	0.091
SSC3	Constantly monitors the commitment that its suppliers have in safety and hygiene, as a process to improve its goals.	0.861 (0.000)	0.101
SSC4	It constantly carries out safety and hygiene audits on its workers to eliminate items that are abandoned or that are not in the right places.	0.876 (0.000)	0.125
SSC5	You have a system to balance the work/family of your employees with the employees of your suppliers throughout the supply chain.	0.825 (0.000)	0.122
SSC6	It has an audit system to verify compliance with the safety and hygiene standards of the employees of its main suppliers.	0.931 (0.000)	0.108
SSC7	It constantly supports its main suppliers to obtain some certification in safety and hygiene standards.	0.790 (0.000)	0.097
SSC8	It has a code of conduct system of ethics with its main suppliers so that they remove damaged or quality-defective products from the company.	0.732 (0.000)	0.074
Sustainable Performance Type A (SDP) Cronbach's alpha: 0.918; Dijkstra–Henseler's rho: 0.928; CRI:0.934; EVI: 0.671			
SDP1	It has among its objectives the care of the environment	0.775 (0.000)	0.127
SDP2	Makes great efforts to promote environmental care	0.706 (0.000)	0.124
SDP3	It has a great commitment to investing in projects that protect the environment	0.859 (0.000)	0.123
SDP4	Frequently discusses the results of environmental care performance within the organization.	0.888 (0.000)	0.135
SDP5	They have excellent performance in protecting the environment compared to other companies in the same industry or sector.	0.876 (0.000)	0.808
SDP6	They are recognized by society for their effectiveness in protecting the environment.	0.810 (0.000)	0.086
Business Performance Type A (ORP) Cronbach's alpha: 0.899; Dijkstra–Henseler's rho: 0.933; CRI: 0.922; EVI: 0.665			
ORP1	Economic benefits have been reduced	0.810 (0.000)	0.110
ORP2	The profit margin has been reduced	0.762 (0.000)	0.103
ORP3	Return on assets has decreased	0.799 (0.000)	0.107
ORP4	Return on investment has been reduced	0.830 (0.000)	0.109
ORP5	Sales volume has been reduced	0.787 (0.000)	0.097
ORP6	Sales performance has decreased	0.893 (0.000)	0.093
ORP7	Cash flow has been reduced	0.844 (0.000)	0.089

Notes: CRI: Composite Reliability Index; EVI: Extracted Variance Index; Q^2: Cross-validated redundancies Stone–Geisser Q^2 index
Source: Own elaboration.

Table 1 shows the results obtained and indicates that the factor loadings of all the items are significant, varying between 0.706 and 0.931, exceeding the minimum recommended level of 0.7. Furthermore, all the constructs are characterized by having a Cronbach's Alpha value greater than 0.8, indicating their level is satisfactory (Hair *et al.*, 2019). Likewise, CRI and Dijkstra-Henseler's rho levels are also above the recommended limit of 0.7. CRI varies between 0.922 and 0.939, while Dijkstra-Henseler's rho is in the range of 0.928 and 0.942, all above the recommended value (Bagozzi et al., 1991; Hair *et al.*, 2011). Finally, the EVI values are at levels that exceed the 0.5 limits proposed by the literature (Fornell & Larcker, 1981; Bagozzi et al., 1991).

Likewise, evaluating the scales requires discriminant validity, which can be measured through the Fornell and Larcker criterion, cross-loadings, and correlations' Heterotrait-Monotrait ratio (HTMT) (Hair *et al.,* 2019). Furthermore, discriminant validity indicates the degree to which a construct is different from the other constructs of a theoretical model (Hair *et al.,* 2019), which is why the most effective measure for its measurement is the HTMT (Henseler *et al.,* 2015) since HTMT is technically an estimate of what the actual correlation between two constructs would be if they were measured perfectly, which is why an HTMT value of less than 0.85 is recommended (Henseler *et al.,* 2015). Table 2 shows the discriminant validity values more clearly.

Table 2 shows the results obtained, and according to the Fornell and Larcker criterion (Panel A), the variance shared between each pair of constructs is less than the variance extracted for each construct, which is feasible to establish the existence of discriminant validity between the scales. Furthermore, the most effective measure for discriminant validity is HTMT (Henseler *et al.,* 2015), and Table 2 shows that the values of the HTMT ratio vary between 0.366 and 0.676, which are very satisfactory. They are far from the maximum recommended value of 0.8 by Henseler *et al.* (2015). Finally, concerning the cross-loadings (Panel B), Table 2 shows that the values of the cross-loadings of each construct are higher than the values of the other scales, which makes it possible to establish the existence of discriminant validity between the three measurement scales.

Table 2. Measurement Model Discriminant Validity

PANEL A Fornell-Larcker Criterion				**Heterotrait–Monotrait Ratio (HTMT)**		
	1	2	3	1	2	3
1 Supply Chain	**0.812**					
2 Sustainability Performance	0.362	**0.819**		0.366		
3 Business Performance	0.466	0.627	**0.816**	0.465	0.676	

PANEL B Cross-loadings							
	SSC	SDP	ORP		SSC	SDP	ORP
SSC1	**0.724**	0.289	**0.888**	SDP4	0.396	0.153	0.574
SSC2	**0.735**	0.222	**0.876**	SDP5	0.436	0.268	0.541
SSC3	**0.861**	0.349	**0.810**	SDP6	0.267	0.350	0.463
SSC4	**0.876**	0.478	0.504	ORP1	0.256	0.257	**0.810**
SSC5	**0.825**	0.354	0.561	ORP2	0.283	0.283	**0.762**
SSC6	**0.931**	0.456	0.592	ORP3	0.376	0.282	**0.799**
SSC7	**0.790**	0.323	0.464	OPR4	0.271	0.415	**0.830**
SSC8	**0.732**	0.432	0.451	OPR5	0.244	0.153	**0.787**
SDP1	0.304	**0.775**	0.526	ORP6	0.331	0.463	**0.893**
SDP2	0.269	**0.666**	0.455	ORP7	0.272	0.437	**0.844**
SDP3	0.505	**0.859**				0.558	

Notes: SSC: Supply Chain; SDP: Sustainable Performance; ORP: Business Performance. **PANEL A:** Fornell-Larcker Criterion: Diagonal elements (bold) are the square root of the variance shared between the constructs and their measures (EVI). For discriminant validity, diagonal elements should be more significant than off-diagonal elements. **PANEL B**: Cross-loadings of the items for all the constructs.
Source: Own elaboration.

RESULTS

To respond to the two research hypotheses raised in this empirical study, PLS-SEM was used with the support of SmartPLS 3.3 software (Hair *et al.*, 2019) since this statistical modeling technique is the most recommended for the type of data available (Chin, 2010; Hair *et al.*, 2011; Henseler *et al.*, 2012), and its application is essentially recommended in those situations in which the theory is less developed (Hair *et al.*, 2012), the objective pursued when applying structural equation modeling is the prediction and explanation of critical constructs (Rigdon, 2012), the small sample size and the non-normality of the data derived from the measurement scales may be present (Henseler *et al.*, 2009; Hair *et al.*, 2012; Goodhue *et al.*, 2012). Table 3 shows more precisely the results obtained from the PLS-SEM application.

The results obtained from the application of PLS-SEM (Table 3) show that the adjusted R^2 value is more significant than 0.10, while f^2 values are positive (Hair *et al.*, 2019), and the SRMR value is below 0.08 (Hu & Bentler, 1998). Furthermore, the geodesic discrepancy (dG) and the unweighted least squares discrepancy (dULS) are below the HI99 values, thereby verifying the significance of the supply chain model (Dijkstra & Henseler, 2015). Finally, the results obtained verify that the supply chain of manufacturing firms in the automotive industry favors sustainable performance but not the level of firm performance, which is why the coefficient linked to the relationship between the supply chain and the sustainable and firm performance levels are 0.466 and 0.362, both being significant with p-values of 0.000.

Table 3. Structural Model

Paths	Path (t-value; p-value)	95% confidence interval	f^2	Support
SSC → SDP	0.466 [5.292; 0.000]	[0.263-0.605]	0.370	Yes
SSC → ORP	0.362 [4.004; 0.000]	[0.148-0.491]	0.225	Yes
Endogenous variable	**Adjusted R^2**	**Model Fit**	**Value**	**HI99**
SDP	0.248	*SRMR*	0.101	0.162
ORP	0.163	dULS	3.535	6.071
		dG	2.071	2.229

Notes: SSC: Supply Chain; SDP: Sustainable Performance; ORP: Firm Performance. One-tailed t-values and p-values in parentheses; bootstrapping 95% confidence intervals (based on n = 5000 subsamples) SRMR: standardized root mean squared residual; dULS: unweighted least squares discrepancy; dG: geodesic discrepancy; HI99: bootstrap-based 99% percentiles.
Source: Own elaboration.

In this sense, the supply chain significantly improves the level of performance of manufacturing firms in the automotive industry, only from the sustainability perspective but not from the economic perspective. Likewise, the coefficient linked to the relationship between the supply chain and the level of sustainable performance is positive and significant

at 0.466 (p-value 0.000), which shows empirical evidence in favor of hypothesis H1 and coincides with the results obtained by Nandi *et al.* (2021). Finally, the results reveal the existence of a significant negative effect of the supply chain and the level of firm performance at 0.362 (p-value 0.000), which indicates that the supply chain is constraining the firm performance of manufacturing firms in the automotive industry, which is in line with the results obtained by Ranney *et al.* (2020).

Additionally, the results obtained in this empirical study also have different implications for managers and organizations, the first of which is related to the data derived from the application of the 65 surveys to the same number of companies, which allowed a general analysis of the existing relationship between the supply chain and the level of both sustainable and firm performance in a strategic sector of the Mexican economy, which is why in future studies it would be pertinent to analyze these same variables in longitudinal studies or successful case studies, to corroborate whether the supply chain is indeed one of the determinants of increased sustainable performance, but at the same time the effect during the COVID-19 pandemic on the supply chain also negatively affects the level of firm performance.

A second implication derived from the results obtained is that not only is a significant change taking place in the supply chain of manufacturing firms worldwide, since, in essence, the supply chain systems have adapted to the conditions of the market caused during the COVID-19 pandemic, by bringing as quickly as possible not only food and medical products to customers' homes, but also all types of products, including vehicles, which means that companies have to improve and make its supply chain management system more efficient, to significantly reduce product delivery times and conditions through a series of nodes and stages that allow products to reach the final consumer in the required conditions and time. Otherwise, supply chain inefficiency will lead to higher costs and market loss (Gligor *et al.*, 2019).

In this sense, the agility of the supply chain of manufacturing firms is presented as a third implication since agility contributes not only to the increase of competitive advantages but also to the improvement of the sustainable performance of companies (Gligor *et al.,* 2019). Thus, supply chain agility generally facilitates the delivery of all types of products to end consumers quickly and efficiently. However, the COVID-19 pandemic is putting increasing pressure on manufacturing firms to streamline their supply chain, not only due to unusual consumer purchasing behavior (Donthu & Gustafsson, 2020) but also to improve their sustainable performance, even though this does not allow them to increase their firm performance.

Under this threshold, despite the complexity that the supply chain represents, the managers of manufacturing firms in the automotive industry in Mexico that have among their goals the promotion of sustainability activities inside and outside the organizations, to future they will be able to obtain a more significant effect on firm performance (Nandi *et al.,* 2021). Therefore, this empirical evidence indicates that managers could increase their firm performance through a holistic strategy that includes the entire supply chain since the COVID-19 pandemic is forcing companies to produce, supply, order, and deliver the products required by end consumers through digital platforms (Ting *et al.,* 2020), which will impact the sustainability of companies.

Furthermore, the results obtained also have implications for the public administration of the three levels of government since government support and legislation are being used more intensely, derived from the pressure exerted by society as a whole (Wesseling *et al.,* 2015), as well as the so-called "new normal" resulting during the COVID-19 pandemic, which is making more evident the need to increase visibility over the supply chain, increase its flexibility and risk management. Therefore, the COVID-19 pandemic is forcing manufacturing firms, including the automotive industry, to prepare to better face future crises and pandemics through changing traditional supply chain systems (Sarkis *et al.,* 2020; Queiroz *et al.,* 2020).

Likewise, this study has several limitations, some of which may become future lines of research. Firstly, the sample only collects information from manufacturing firms in the automotive industry in Mexico, so the results could not be generalized to other sectors or other countries, and it would be interesting to apply more studies of this type in different sectors or countries to verify the results obtained. Secondly, only one study has been carried out considering cross-sectional data, so temporal effects have yet to be analyzed in the proposed model, hence the importance of researchers, academics, and industry professionals carrying out longitudinal studies. Thirdly, a survey was applied only to company managers. In future studies, it would be essential to analyze the effects of the COVID-19 pandemic on workers' health and validate the information with data from subsequent companies to the COVID-19 pandemic.

Thirdly, the information was obtained only from 65 surveys that collected the opinions of company managers. Therefore, using quantitative data from other sources or the opinions of employees and suppliers could reinforce the results obtained in this study (Afsar *et al.,* 2020). However, it is essential to highlight that the level of formal information in Mexico through statistics needs to be revised. Furthermore, this study opens future lines of research that can contribute to strengthening the literature on sustainability and supply chain in the automotive industry since some of these future studies can be oriented towards the analysis of the mediating effect of some particular characteristics of managers of manufacturing firms such

as level of education, gender, experience, etc., or contingent factors such as the level of growth of the companies, their level of dynamism, competitiveness, etc.

CONCLUSIONS

The results obtained in this study allow us to generate various conclusions, among which the following stand out. The first conclusion is that the model of the relationship between the supply chain, sustainable performance, and firm performance has internal solid consistency, obtaining a high correlation between the three constructs, which allowed the acceptance of the two proposed hypotheses. A second conclusion is that the supply chain can be considered an effective business strategy since it generates various benefits not only to final consumers but also to manufacturing firms that make up the Mexican automotive industry, as it is considered an alternative for reducing the adverse effects caused during the COVID-19 pandemic, not only in Mexico but also globally.

A third conclusion is that this study focuses on how the supply chain contributes to increasing sustainable performance and decreasing firm performance in the context of the Mexican automotive industry through the analysis of an empirical study on a sample of 65 manufacturing firms. Thus, the relationship between these three constructs is a topic that is still open to discussion in the current literature (Mena & Schoenherr, 2020), with the literature establishing the need for researchers, academics, and industry professionals to guide their studies in the empirical contrast in different contexts (Nandi *et al.*, 2021).

A fourth conclusion is that the results obtained have shown that supply chain activities strongly influence the sustainable performance of manufacturing firms in the automotive industry in Mexico since these effects are not only direct and cheerful but also significant adverse indirect effects are identified that allow us to establish the existence of a reduction in the level of firm performance. In this sense, the sustainable performance of the manufacturing firms analyzed benefits from the good practices implemented through supply chain activities, even when they are also reducing the level of firm performance.

Finally, the supply chain is strongly associated with increasing sustainable performance (Hazarika *et al.*, 2019; Lin *et al.*, 2020) and decreasing firm performance (Ivanov & Das, 2020; Chowdhury *et al.*, 2021). Therefore, this empirical study contributes to previous literature by enriching the analysis and discussion on sustainability and providing theoretical and empirical evidence that determines the importance of the relationship between the supply chain and sustainable performance and the level of firm performance. This is especially important since, due to the level of complexity and global expansion of the automotive

industry supply chain, manufacturing firms face various internal changes to adequately and efficiently manage the adverse effects of the COVID-19 pandemic (Nandi *et al.*, 2021).

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Unveiling the Disruptive Force: Analyzing the Impact of Digital Shopping

Revelando la fuerza disruptiva: análisis del impacto de las compras digitales en la industria minorista tradicional

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ABSTRACT

The present research aims to analyze the influence of digital shopping on the traditional retail industry in Tamil Nadu. The present research executes a quantitative analysis utilizing the SPSS version 23 software package. A structured questionnaire survey technique is employed to gather the data from the traditional retailers in Tamil Nadu. A judgment sampling strategy has been adopted for analysis. The objective of the method is to collect data relating to conventional retailers' perceptions of the impact of online shopping applications. Descriptive statistics, ANOVA, regression, and Pearson correlation analysis were performed in the research. The study's outcomes revealed that digital shopping significantly impacts the growth and profitability of the offline retail industry. Furthermore, the study also evaluates the socio-economic and psychological factors prompting the purchasing behavior of consumers in Tamil Nadu. The study recommends that traditional retailers enhance their strategies to improve their business over online retail marketers.

Keywords: Internet, Online shopping, Retailer, Profitability, Growth, Competitiveness.

JEL code: M3

RESUMEN

La presente investigación tiene como objetivo analizar la influencia de las compras digitales en la industria minorista tradicional en Tamil Nadu. La presente investigación ejecuta un análisis cuantitativo utilizando el paquete de software SPSS versión 23. Se emplea una técnica de encuesta de cuestionario estructurado para recopilar datos de los minoristas tradicionales en Tamil Nadu. Se ha adoptado una estrategia de muestreo de juicio para el análisis. El objetivo del método es recopilar datos relacionados con las percepciones de los minoristas convencionales sobre el impacto de las aplicaciones de compras en línea. En la investigación se realizó estadística descriptiva, ANOVA, regresión y análisis de correlación de Pearson. Los resultados del estudio revelaron que las compras digitales tienen un impacto significativo en el crecimiento y la rentabilidad de la industria minorista fuera de línea. Además, el estudio también evalúa los factores socioeconómicos y psicológicos que impulsan el comportamiento de compra de los consumidores en Tamil Nadu. El estudio recomienda que los minoristas tradicionales mejoren sus estrategias para mejorar su negocio frente a los vendedores minoristas en línea.

Palabras clave: Internet, Compras online, Venta al detalle, Rentabilidad, Crecimiento, Competitividad.

Código JEL: M3.

INTRODUCTION

In recent years, analyzing and learning consumer behavior has been crucial for an organization's offline or online success (Kapuria & Nalawade, 2021). Consumers are the only factor that drives the market. All corporate activities are conducted with considering the customer's interests in mind (Sarkar & Das, 2017). Traditional shopping is the process of selling, buying, or exchanging goods; information or services are physically possible in a physical store (Balaji & Murugavel, 2022). Otherwise, offline or traditional shopping refers to anyone visiting a shop, mall, or store and purchasing anything they require (Vora, 2018).

With the advancement of novel thoughts, offline retail businesses have had a sturdy demand for internet transformation. In the omnichannel market, offline, online interconnection, and closed-loop consumption are taking shape (Wang et al., 2021). The altering tastes of customers, rising revenue levels, rising mobile usage, and broader access to digital media substantially impact the Indian retail industry's dynamics (Halan & Singh, 2023).

E-commerce in India is anticipated to attain Rs.2,000 billion by the year 2023, mainly driven by classifications like electronics and fashion (Sudhakar Shukla, 2021). Comparing online to offline (O2O) and business to consumer attracts probable consumers by bridging the gap between the online platform and physical store (Ryu et al., 2022), which allows customers to experience physical products in brick-and-mortar stores and then pay and buy the product online (Wang et al., 2021).

Some existing researchers have developed an O2O model to bridge the gap between online platforms and physical stores (Kim et al., 2022). The O2O model is not an easy integration of offline and online, yet it is an organic integration (Chai et al., 2021; Wang et al., 2021). Many businesses must build a seamless experience between offline and online interactions to retain and attract customers (Shen et al., 2019).

The rising penetration of smartphones and the internet and altering customer preferences have been the primary drivers of this development. Offline stores and online platforms operate separately and cannot cooperate, which fails to offer seamless service for customers (Chen et al., 2019). Some studies on the O2O model have recently prevailed, including consumer purchase and return policies, service quality, and supply chain management (Kim et al., 2022; Shi et al., 2019). With the fast improvement of e-commerce, customers are entering a multichannel period (Du et al., 2019).

The studies on multichannel management, showrooming, and free-rising represent the most customers turning into cross-channel purchasers, and the influencing aspects are assessed by

integrating offline and online channels (Swoboda & Winters, 2021). As the O2O model combines offline and online, it is essential to comprehend how customers consider the offline and online influencing aspects to coordinate offline stores with online platforms (Vinhas & Gibbs, 2018). Offline retail businesses experience extreme competition from several sources because of increased online shopping. The menace of online shopping relates to all small start-up companies and large organizations (Lee et al., 2022). Just because an organization is an industry leader currently, there is no assurance that it will retain its competitive edge in the future (Lumadi, 2014). The menace of online shopping is more significant, particularly for traditional businesses unprepared to embrace the altering commercial landscape (Kaushik et al., 2020). All retail sectors must consider the challenges they face in their market growth (Kamalesh, 2023).

The pandemic increased online sales and led to faster development in online shopping, but it also hindered the offline sales of traditional businesses (Siddiqui & Mehrotra, 2021). Online shopping's success became a drawback for conventional shopping in some areas. Online shopping has advantages and disadvantages that are the same as those of traditional retail businesses. A mix of price, convenience, quality, and lack of time alters how customers shop in India (Ahlawat et al., 2022).

Most older people in India prefer traditional retail shopping due to the need for more awareness of the online platform and the lack of trust and security. The conventional shopping procedure, where individuals swift through goods and feel the textures and colors feel them can be greatly enjoyable (Jain, 2014). Also, shopping in India is well-known for the time a family spends together, such as an outing on holidays or weekends (Halan & Singh, 2023).

The entire family goes together, does some shopping, catches movies, and eats in a restaurant. It is practically a family get-together on any day, but it is not probable due to the family members' hectic work schedules (Billings, 2024). However, these experiences cannot be experienced through online shopping. One can purchase any product more easily online, and the experience of spending the most valuable time with one's family cannot be simulated by oneself (Sarkar & Das, 2017).

Regardless of the relevance of customer offline behavior and online attitudes, most studies have yet to enlarge beyond online behavior and online attitude into offline behavior (Bhat et al., 2020). Only some studies have tried to explore the offline behavioral intention of customers from Tamil Nadu (Kang et al., 2018). The counting to retail spaces in Tamil Nadu has its innate cultural purchasing strategies in markets. The necessity of regulating commodity costs and prices is also evident in the postulate of well-established offline retailing procedures in stores in the Tamil Nadu region. Therefore, the study aims to study the Influence of online shopping on offline traditional retail businesses in Tamil Nadu.

PROBLEM STATEMENT

In recent years, many Tamil Nadu retailers have faced many issues with online shopping; it has significantly influenced the retail business and the economic growth in the Tamil Nadu area. Consumers are altering business regulations, and retailers should adapt to them. Retailers, thus, must meet changing consumer demands in physical stores and online through the related novel solutions and the combination of offline and online shopping experiences (Ponraj, 2019). Online shopping positively and negatively impact traditional stores (Gupta, 2020). It is dramatically considered that conventional retail shops in Tamil Nadu must increase their share gain, keep their customers happy, and, in the meantime, look to attain maximum profit.

Nevertheless, online shopping helps to develop traditional businesses into the online business world, which promotes financial benefits (Kumar & Ayodeji, 2021). However, some conventional businesses experience heavy losses in their profitability because of the evolution of online shopping. Ultimately, retailers from varied districts in Tamil Nadu appear to be rationally confined to the prospective adoption of online business patterns. Since intense attraction to shopping motives also demands the traditional business pattern, adopting online practices may require high-cost facilitations and will be overwhelming for small retailers. So, some conventional retailers might even go out of business.

Because of online shopping, traditional offline retailers experience problems such as decreased profit, reduced sales volume, FDI investment, maintaining various stocks, 24/7 services, the arrival of technologies, and various payment methods . Thus, the present study analyzes the Influence of online shopping on traditional retail businesses.

SIGNIFICANCE OF STUDY

The study provides insights into the influence of digital shopping on the traditional retail business. Product diversity, trust, convenience, psychological factors, and payment methods influence customers to opt for online and offline shopping. Procurement of services or products over the internet, online shopping has gained massive popularity in recent years, primarily due to individuals find it easy and convenient to purchase from the comfort of their office or home and also relieved from the troubles of going from one shop to another in pursuit of good quality.

The arrival of technological advances and the internet has been both a boon and a bane to traditional retailers (Banerjee, 2019). Those who want to expand their business to the next level adopt an online shopping method to fulfill the consumers' requirements and attract and retain existing customers. The study also analyzes the various factors influencing online and offline shopping. The study has highlighted several factors affecting traditional retailers, like a decrease in profit, reduced sales volume, a decrease in customer base, etc.

Research objectives

- To assess the factors that influence consumers towards offline purchases.
- To evaluate the various benefits derived by consumers inclined to shop online.
- To examine the retailer's opinion towards traditional retailing and online shopping.

Research Hypothesis

H11: Online shopping is more prevalent among consumers in Tamil Nadu
H10: Online shopping is not commonplace among consumers in Tamil Nadu
H21: Digital marketing has a significant impact on traditional retail marketing in Tamil Nadu
H20: Digital marketing has no significant effect on traditional retail marketing in Tamil Nadu
H31: There is a significant association between issues of online shopping and consumer behavior
H30: There is no significant association between issues of online shopping and consumer behavior
H41: Socio-economic and psychological factors have a significant impact on traditional retail marketing
H40: Socio-economic and psychological factors do not have a significant impact on traditional retail marketing

The paper is organized in the following order: Section 1 provides an elaborate introduction regarding the Influence of digital shopping applications among traditional retailers in Tamil Nadu. Furthermore, the introduction section illustrates the significance of the research. In section 2, prevailing research works related to the current study will be reviewed. The current study's research methodology will be elucidated in section 3. In section 4, the outcome of the analysis will be discussed. In section 5, the outcome of the analysis will be addressed with existing studies. Finally, in section 6, the brief conclusion regarding the current research will be discussed along with limitations and future recommendations of the study.

LITERATURE REVIEW

Factors influencing offline and online purchase

Behavior of consumers is the study of how people use and select a product or service and also considers the motivations, psychology, and behavioral traits. The research aimed to discover the diverse aspects and their impacts on the customer's procurement pattern for readymade garments in online and offline modes of shopping. The study was conducted using qualitative analysis based on secondary data.

The research exposed that the primary aspects are psychological, economic, cultural, and social factors that affect the buying patterns of consumers. The results would support traditional retailers of readymade garments and online shopping sites in considering all the other aspects when farming the marketing strategies to satisfy their consumers and attain marketing objectives. Also, the study concluded that the buying pattern alters a person's life cycle in the circumstances of garments. Also, the study stated that peer groups and family references impact an individual's purchasing behavior.

Demographic and socioeconomic aspects also contribute to the improvement of modern retail formats. The main goal of the research (Upadhyay, 2015) was to study the impacts of socioeconomic aspects on the buying patterns of urban youth in the retail market. The study used purposive sampling methods and the non-probability judgment sampling approach. In this sampling method, the scholar selects a sample from the set population that the researcher considers to represent the total population. The study used primary data and employed a structured questionnaire method to collect data. The data was collected from 300 participants, which was considered essential and valuable since it contained all applicable information required to fulfill the aim of the study. The study was based on the exploratory study model in which the effects of socioeconomic aspects on the purchase patterns of urban youth in the retail market are enquired about.

The entire shopping concept has undergone a sea alteration in customer buying behavior and format, ushering in a shopping behavior revolution in India. The study (Jain, 2014) compared the diverse aspects that affect the customers' buying behavior regarding purchases from an unorganized or organized retail outlet in Rajasthan. The current study empirically analyzed the buying behavior of unorganized and organized retail consumers in Rajasthan. The study collected responses from 400 consumers, of which 200 were taken from unorganized and the other 200 from organized retail outlets.

The survey was conducted in Ajmer, Jaipur City, Jodhpur, Kota, and Udaipur. The study of retail consumers' purchase behavior states that critical buying decision influencers shape consumers' preferences regarding what to purchase and where. The study identified that unorganized retail has many advantages, such as home delivery, credit facility, and availability of petty and small things, but is deprived of various fronts like an attractive image of the store, convenience when shopping, and great ambiance and so on. The study suggested that these are all reasons for the organized and unorganized retail outlets required to develop on several fronts.

Economic impact of online and offline shopping

Online shopping is a new, convenient way of shopping (Reddy, 2015). The study aimed to identify the impacts of online shopping on the real economy. The study identified four negative impacts. The first one includes the lower cost of online stores, which would enhance the bankruptcy of medium and small-sized businesses. The second one, online stores, has a low demand for entity shops that would affect the real estate industries. Third, the staff waste rate in online shops is higher. Lastly, they can lower the product price due to the lower cost of online shops. Certain retailers would keep lowering the product prices to attract more customers, leading to market competition.

One of the fast-developing sectors in India is the retail sector. It is the economy's backbone and around 10% of the nation's GDP. The study aimed to comprehend a consumer's perspective on the COVID-19 impact on offline traditional shopping. The study used a structured questionnaire to administer responses and gather reliable information. The study collected 100 responses, in which 50 females and 50 males from diverse age groups were selected.

The study stated that to survive in the market, the transformation of offline traditional trade or shopping to online is one of the aspects that has grasped attention worldwide. Online shopping was improved during COVID-19, and there are opportunities for buyers and sellers to identify a novel way to buy and sell their services and products. Online shopping uses the gains of the internet for an economical and faster way to do business during the pandemic.

Influence of online shopping on traditional retailers

Online business has transformed the business simulation and altered how consumers approach retail. Despite its momentous impact on shopping behavior, e-commerce is simply an evolution. Several manufacturers and retailers have quickly identified the various opportunities created by new technology.

The study aimed to examine the opinion of the retailers towards online shopping as well as their demographic profile. Fastness is not the success of online marketing; it is the size, brands, variety, and cheap cost. These factors are offered to the consumer once rather than in

the subsequent purchase. All these aspects are to be valued by the consumers occasionally when they buy the product. The study discovered that online marketing retailers proved competitive and diligent in breaking people's traditional shopping habits. The study suggested that if the sustained tactics are boosted with sufficient modification, the business will grow into a million-dollar business in the upcoming years.

The marketing standards have achieved a paradigm swing with the involvement of technology in marketing products and services. The marketing procedure has wholly moved from traditional logistics to modern logistics. The objective (Aashirwad, 2022) was to explore the effect produced by online marketing on traditional retail textile stores in the study area.

The traditional retail textile shop owners in Chennai were considered for data collection for the study. There are two basic techniques for sampling: non-probability and probability sampling. There has yet to be a definite list of individuals for textile retailers in Chennai. Therefore, it was decided to choose a store from the taluks randomly.

The study was conducted based on the sample size of 320 retail textile stores and grounded on that to have a geographic representation of the chosen district; the sample was distributed amongst an equal distribution of textile stores based on several taluks from every income division of Chennai. The study made several recommendations that may aid in enhancing the position of textile retailers in the market. The study suggested many strategies, and adopting some will encourage textile retailers to improve their business opportunities for a long duration while enduring the effects of online marketing.

In the past ten years, the internet has changed the method of buying and selling products and services. The study aimed to comprehend the effects of online shopping on retail trade-in Tirunelveli. The study's population includes online shoppers and retailers in Tirunelveli district. Retailers belong to various industries like jewelry, consumer goods, textiles, books, the service sector, technological goods, etc. The size of the study population is unknown and cannot be defined in precise numbers.

The researcher used a sample survey method. Retailers are facing a tough time enduring the effects of online shopping trends spreading like a virus among most people in the nation. Therefore, retailers have to manage the current distraction from digital technologies and prioritize investment in technologies that will add value for the customers or enhance the efficiency of the functions. Both retail and e-stores have to survive in their method. They both offer livelihood to thousands of individuals.

The retail industry in India has developed into the most fast-paced and dynamic industry because of the arrival of various new players. The study aimed to explore the opinion of retailers towards online shopping and traditional retailing. The study also intended to test the significance and relationship between the perception of traditional retailers and online shoppers. The study used a structured questionnaire to collect data from 384 respondents.

The retailers functioning with multiple and single brands are satisfied with the several tactics created by the online companies, shopping pleasure, quality guarantee, deprived of hygiene in traditional shopping, ethics of business is followed, facilities prepared over affirmative, variety, contiguity, reduction and destructive have high impacts on online shopping. The study identified other benefits such as image, value, expectation, service, quality, loyalty, and satisfaction that substantially impacted traditional shopping over online shopping. Therefore, the study stated that customers are more enlightened and happier with online purchases than with offline shopping.

The dynamics of the retail industry in India are substantially influenced by altering consumer tastes, increasing income levels, broad access to digital media, and rising usage of mobile. The study (Sudhakar Shukla, 2021) aimed to analyze the impacts of online shopping over traditional offline retail shops in the electronic products sector. The study used a structured questionnaire to collect data grounded on general knowledge and theory; the scholar framed the questionnaire. The retail industry can adapt to altering trends and comprehend the customers' mentality, which will become a successful investment. In contrast, others who ignore understanding the customers' mindset might risk losing a substantial amount of enterprise.

Research Gap

The retail industry in India has 12 million outlets, the largest in the world. The study's limitations are that the respondents were unwilling to provide actual information and needed to gain awareness of some features. The restriction to keep the questionnaire concise has limited the study in some features. Also, the study area was limited to only a few cities in the Tamil Nadu district, which led to a limitation.

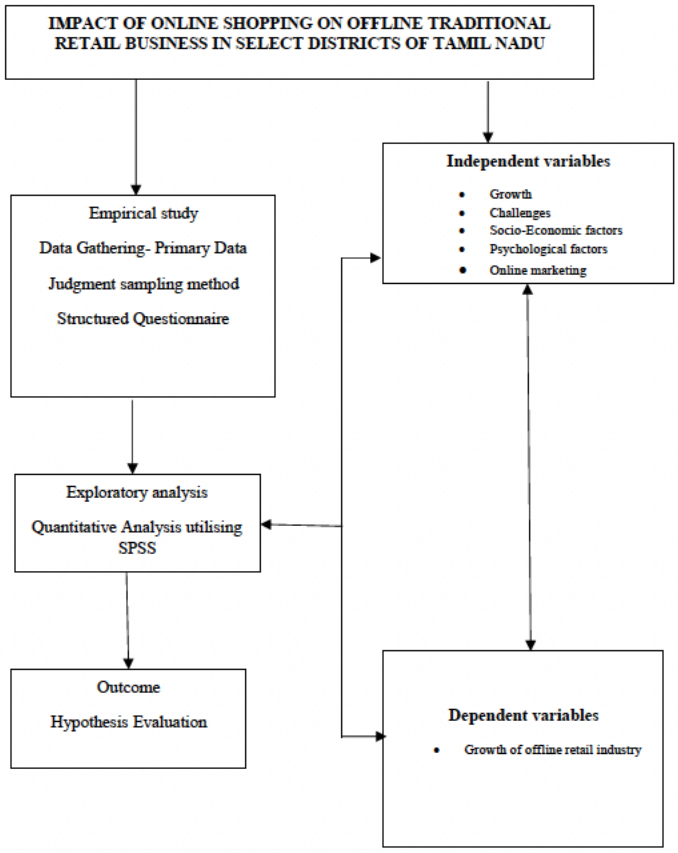
RESEARCH METHODOLOGY

Research Design

The current research is reliant on empirical as well as descriptive studies. The research embraces the quantitative analysis technique and practices the primary data. The primary data collection was accomplished by surveying with questionnaires, and then the gathered data was analyzed using the SPSS tool. The data will be collected from the retail shop owners. The primary data collected is nearly 100 from the owners of traditional retail businesses.

The primary stage of the research design identifies the variables that contributed to the impacts of online shopping. The factors influencing offline and online shopping were explained. The research by design is quantitative and exploratory, seeking to uncover the underlying impacts of online shopping, not traditional retail business. All the positive and negative factors were considered in the study.

Figure 1. Research Strategy



Source: Own elaboration.

The data is gathered from the retailers. Establishing the relationship and link between the variables selected in this study is performed by implementing ANOVA evaluation, correlation, frequency of the variables, and regression evaluation. The process included in the study is illustrated in Figure 1. The independent variables of Growth, Challenges, economic impact, and online marketing are considered. The dependent variables are online shopping and Offline shopping.

Data Collection Strategy and Participants

The most crucial stage of research is the data collection process. This emphasizes the research objectives to increase logical knowledge of research questions. The primary responsibility of a researcher is to select a suitable data collection method. Data has been collected from 100 retailers to analyze the impact of online shopping on traditional retail businesses. The data was collected from retailers who face challenges due to online shopping.

Data Sampling and Sample Size

The judgment sampling method was used to select the sample from the population. The current study utilizes the Judgment sampling approach in the primary data and secondary data sources, a non-probability sampling technique where the researcher decides who must be combined or obtained as the sample regarding his knowledge and judgment (Thomas, 2022).

The respondent's selection process is expected to provide beneficial information for the research. The main reason for using a purposive sampling strategy is because the statement is constructed based on the research objectives, and specific people may provide substantial views needed for the research questions. Thus, it is required to be combined into the sample (Denieffe, 2020). The samples under this purposive sampling approach are obtained from 100 retailers.

Sample Size

The valuable respondents for the survey were filtered using purposive sampling methods. The sample size for the research is 100 retailers from various sectors were considered. After collecting the data, it is fed as different variables and assessed through the SPSS tool to accomplish the research aim.

Research Instrument

The research tools are employed in education, health sciences, and social sciences to monitor scholars and clients. The probable research uses a structured questionnaire from numerous respondents. The instrument utilized in the study is the structured questionnaire, which is revealed as the survey questions. Questionnaires were designed and distributed to retailers of the traditional retail business. Every sample possesses the same probability as other research samples to be chosen, representing the whole population.

Data analysis

Quantitative analysis is designated as a systematic phenomenon through congregating data and executing computational, mathematical, and statistical approaches (Jung, 2019). The quantitative approach congregated data from prospective and conventional management employees with sampling tools and provided online surveys, polls, etc. The outcome of the

quantitative method is determined numerically. The numerical values are interpreted, and the upcoming research is predicted along with appropriate changes.

The quantitative data analysis method analyzes data gathered using structured questionnaires from sample respondents. The data are recorded using an Excel sheet to reveal study variables. The software tool SPSS analyzes the study variables in the Excel sheet. The study's outcome is estimated using five approaches: ANOVA, Reliability, Correlation, Coefficient, and Frequency.

The given techniques will be applied to identify the data and verify the association between the study variables of the current research. Based on the outcome of the study variable, interpretations will be conducted, and essential development will be recommended for the current study. With the help of SPSS software, the outcome of the current research will be efficient for documenting the study variables. The result of the variables' frequency will be demonstrated in the figures and table. In contrast, correlation, ANOVA, and regression evaluations will be conducted to assess the current study's structured hypothesis.

Many researchers utilize SPSS software to analyze both quantitative and qualitative data. The software will perform various text analysis, descriptive statistical analysis, data integration, open-source extensibility, and machine learning algorithms. SPSS software will be used to analyze empirical and qualitative data along with the congregated data from the targeted participants. The software will convert and cover the scale of the questions. This software will aid the researchers in enhancing the projects, identifying the study problem, and providing solutions for the identified issues through statistical analysis. Moreover, this software tests the study's hypothesis and assumes the statistical effect among the study variables. Therefore, the current study will utilize SPSS software to analyze the study's test hypothesis.

Ethical considerations

Certain ethics will be followed while conducting the research analysis as the study is based on the Influence of online shopping on traditional retail businesses. There are various factors influencing online and offline shopping. The morals followed in the study are before the researcher's survey evaluation, and data is passed to the participants in the prior phase. The participants are not forced by any means to give their responses. Only those who were willing to respond were selected for the survey analysis. Only the responses to the questionnaire are asked of the participants, and their private data or reports are not forced to be exposed by them. Since the study uses primary data for data analysis, it contains no false data. All the data gathered and organized would be kept highly confidential. These are the ethical considerations used by the scholar for the study analysis, which is accurate to their knowledge based upon this research study.

RESULTS

The data collected via survey questionnaires were examined with the software tool SPSS and analyzed for outcomes based on the variables used in the study. The results satisfy the objectives of the study through the research design. Moreover, a detailed analysis of the responses based on the different demographies is performed.

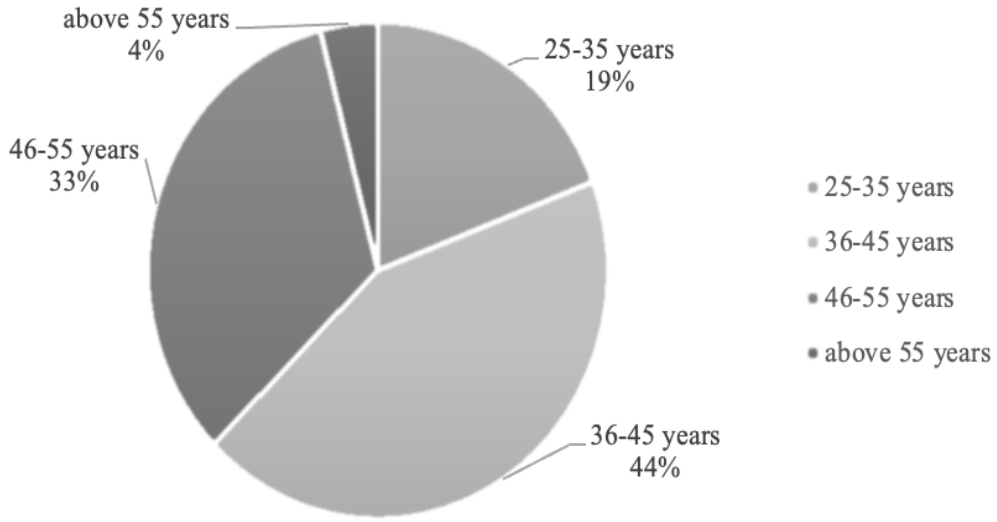
Table 1. Age group of the respondents

		Frequency (f)	Percent (%)	Valid (%)	Cumulative (C)
Valid	25-35 years	19	19.2	19.2	19.2
	36-45 years	43	43.4	43.4	62.6
	46-55 years	33	33.3	33.3	96.0
	above 55 years	4	4.0	4.0	100.0
	Total	99	100.0	100.0	

Source: Own elaboration.

Graph 1 illustrates the age group of the participants. Several respondents are in the 36-45 age group. This group contributes more to the research study. Such a group has updated its knowledge of online shopping applications, enhancing the research to be more precise and accurate.

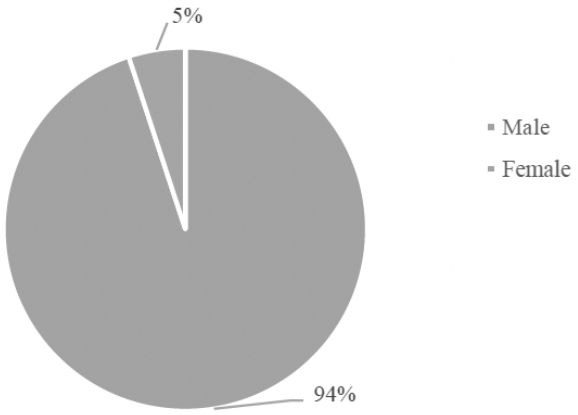
Graph 1. Age group of the retailers



Source: Own elaboration.

Graph 2 illustrates the gender of the participants. Most of the respondents are male. This group contributes more to the research study. Their contribution enhances the research to be more precise and accurate. In total, 94% of the respondents are male community. One of the prospective reasons for its majority of males is cultural significance since this research attempted to indicate the sort of Tamil Nadu conductance and the retail establishment of shopping chiefly depended on males more than females in the selected region. While adapting to local retailers from South Indian districts, the Tamil Nadu region contributed to increased male persons in the retail business. Hence, it shows a more significant difference in male dominance in gender groups.

Graph 2. Gender of the retailers



Source: Own elaboration.

The educational background of the retailers is analyzed. Nearly 33% of the respondents need to be more literate. 43% of respondents completed the undergraduate degree. Only 7% of the respondents are postgraduates. Undergraduate retailers contributed more to the research (Table 2).

Table 2. Level of education

		f	%	V%	C%
Valid	Illiterate	33	33.3	33.3	33.3
	Under-graduation	43	43.4	43.4	76.8
	Post-Graduation	7	7.1	7.1	83.8
	Diploma	16	16.2	16.2	100.0
	Total	99	100.0	100.0	

Source: Own elaboration.

Hypothesis 1

Frequency testing

It is utilized to identify the number of occurrences of specific variables and measure the reliability of prediction.

Table 3 Online vs. Offline Marketing

		F	%	V%	C%
Valid	Neighbouring shops	30	29.3	29.3	29.3
	Online retailers	66	66.7	66.7	96.0
	Shopping malls	3	3.0	3.0	99.0
	Executive showroom	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Source: Own elaboration.

Table 3 illustrates the competitors of retailers in Tamil Nadu. Most of the respondents agree that online retailers are their competitors. The perception of retailers is depicted through frequency analysis. It has comprehended the relevance of undertaken cases and their validated conditions over offline and online retailing approaches, wherein the depiction of offline retail methods, including neighboring shops, shopping malls, and executive showrooms, were added, and aside from it, online retailers were moderately considered. The concluded quantified results have determined that hypothesis 1 has proven favorable.

H11: The above analysis proves that online shopping is more prevalent among consumers in Tamil Nadu, and the null hypothesis has been rejected.

Hypothesis 2

42 *One-way ANOVA Test*

It is utilized to determine the impact of independent factors and research objectives on dependent variables and to investigate variation (Liang et al., 2019).

Table 4 illustrates the impact of digital marketing on traditional retailers in Tamil Nadu. The one-way ANOVA outcome proves that most retailers agreed regarding the impact of online marketing on traditional retailers. Table 5 demonstrates the outcome of the ANOVA test. The outcome illustrates the p-value of .000, proving a noteworthy influence among digital marketing and traditional retailers.

Table 4. Descriptive statistics

	N	**Mean**	**SD**	**SE**	**95% CI for Mean**		**Min.**	**Max.**
					L	**U**		
Neighboring shops	30	1.34	.484	.090	1.16	1.53	1	2
Online retailers	66	1.06	.298	.037	.99	1.13	1	3
Shopping malls	3	1.00	.000	.000	1.00	1.00	1	1
executive showroom	1	5.00	.000	.000	1.00	1.00	5	5
Total	100	1.18	.541	.054	1.07	1.29	1	5

Source: Own elaboration.

Table 5 demonstrates the outcome of the ANOVA test. The outcome illustrates the p-value of .000, proving a noteworthy influence among digital marketing and traditional retailers.

The numerical demonstration shows the significant relationship between online retail evolution and conventional retail techniques. The contemplation on marketing-based stratagems, the aspect with a prevailing retail approach, determined a higher efficacy and viable association along the nature of online retailers. So, it is conceived that digital marketing attributes will considerately influence the facets of traditional tactics that ensue in marketing procedures. Meanwhile, the test results from one-way ANOVA estimations have rejected the null hypothesis.

Table 5 ANOVA

	SOS	df	M^2	F	Sig.
Between Groups	16.418	3	5.473	42.237	.000
Within Groups	12.309	95	.130		
Total	28.727	98			

Source: Own elaboration.

H21: The above analysis proves that digital marketing significantly impacts traditional retail marketing in Tamil Nadu, and the null hypothesis has been rejected.

Hypothesis 3

Correlation

The Pearson correlation method assesses the association between two study variables. The correlation value decides the association between the variables. If the correlation value is 1 or -1, it is considered to have an association between the variables. Hence, the present study utilizes the Pearson correlation to determine the significant association between online shopping issues and consumer behavior.

Table 6 Correlations

Control Variables			Luxury goods	unboxed	Refund issue
shopping trends	Luxury goods	Correlation (Cr)	1.000	.403	.546
		S (2-tailed)	.	.000	.000
		df	0	96	96
	unboxed	Cr	.403	1.000	.796
		S (2-tailed)	.000	.	.000
		df	96	0	96
	Refund issue	Cr	.546	.796	1.000
		S (2-tailed)	.000	.000	.
		df	96	96	0

Source: Own elaboration.

Table 6 illustrates the outcome of the correlation test for determining the association between digital marketing issues and consumers' purchasing patterns in Tamil Nadu. The p-value of correlation is .000, and the correlation value is positive, demonstrating the association between the two study variables. The outcome of the correlation test proves a significant

association between digital marketing issues and consumers' purchasing patterns in Tamil Nadu. It has been recognized that the entrusted features of customers' purchasing behavior are dependable while endorsing online shopping procedures in retail. Also, the signified interventional cause occurs because they lack reliable choice in customer preferences rather than offline marketing. Hence, the outcome rejects the null hypothesis.

H31: The above analysis proves a significant association between online shopping and consumer behavior.

Hypothesis 4

Table 7 ANOVA

		SOS	df	M^2	F	Sig.
Cheapest price	Between Groups	20.490	3	6.830	54.833	.000
	Within Groups	11.833	95	.125		
	Total	32.323	98			
status	Between Groups	13.908	3	4.636	64.976	.000
	Within Groups	6.778	95	.071		
	Total	20.687	98			

Source: Own elaboration.

Table 7 demonstrates the outcome of the ANOVA test. The outcome illustrates that the p-value is .000, which proves the significant impact of socioeconomic and psychological factors on traditional retailers. Factors such as the lowest price, laziness, and status in online shopping influence the consumer to prefer online shopping over conventional retail shopping. At this moment, the perplexing characteristics of consumer behavior toward shopping preferences and economic aspects are also conceived as a significant impact factor on the positive effect of the traditional practices followed in retail marketing. The obtained outcome of one-way ANOVA evidenced that the null hypothesis had been rejected.

H41: The above analysis proves that socio-economic and psychological factors significantly impact traditional retail marketing.

DISCUSSION

Numerous researchers have congregated several factors in proposing the influence of the online shopping process on the retail business and screening traditional retailers' statuses involving customer insights. Remarkably, the current study's outcome proves that online marketing influences the growth and profitability of traditional retailers by quantifying analysis tests. The subsequent test analyses, such as Correlation and ANOVA testing,

demonstrate the significant association between challenges of online marketing and purchasing patterns among the consumers in Tamil Nadu. While contemplating customer satisfaction, the present study also highlights the socioeconomic and psychological factors that significantly impact consumers' purchasing intention in Tamil Nadu.

Nevertheless, the existing study (Maiti, 2021) analyses the primary aspects, which are psychological, economic, cultural, and social factors that affect the buying patterns of consumers. In the present research work, the denoted dependencies may oscillate the consumers' buying preferences by online shopping initiatives. The results would support traditional retailers of readymade garments and online shopping sites in considering all the other aspects when farming the marketing strategies to satisfy their consumers and attain marketing objectives. Likewise, the present study concludes that socioeconomic and psychological factors influence the growth of traditional retail marketing in Tamil Nadu.

Similarly, the existing study (Jain, 2014) concludes that traditional retail has many advantages, such as home delivery, credit facilities, and availability of petty and small things, but is deprived of various fronts like an attractive image of the store, convenience when shopping, and great ambiance—the consumer behavior changes according to the challenges faced in the online marketing. The present study also acknowledges the challenges of online marketing and the fact that consumer intention will change due to the issues in digital marketing. The terminated results also indicated the limiting effects compared to traditional retailing strategies in markets.

Likewise, the existing study (Sudhakar Shukla, 2021) analyses the impacts of online shopping over traditional offline retail shops in the electronic products sector. However, the present research attempted to prioritize configured-based observation to elucidate the diverse perceptions for purposing broadened consideration. From the research's analysis delivery, the conventional study recommends that the retail industry adapts to altering trends and comprehend the customers' mentality, which will become a successful investment to enhance the business's profitability. The present study also recommends overcoming the challenges of the traditional retail industry and offering more beneficiaries to consumers, which will pave the way to compete in online retail marketing.

Limitation

The study's chief constraint is that the research participants are from Tamil Nadu. Hence, the consequences might lack generalizability. Human activities are an ever-changing module that cannot remain constant. Therefore, the study's outcome continuously varies with the modifications in consumer behavior. However, the inference provided by the research can be valuable in improving the marketing strategies of the traditional retail industry.

CONCLUSIONS

Online shopping has increased tremendously in the past few years, and most of the populace has become online buyers. Digital shopping has achieved speedy growth in India. It saves both time and money. The present study analyses the Influence of online retail shopping on the traditional retail industry in Tamil Nadu. Digital shopping affects the growth of the conventional retail sector. Several factors influence consumers to prefer online marketing rather than physical shopping.

The technology revolution has transformed the consumers' purchasing of products online. Even though online retail marketing has numerous beneficiaries, it also has the risk of fraudulent, insecure transactions, refund issues, and the inability to touch the products physically. Traditional retailers should focus on the challenges of online retail marketing. Retailers should adopt innovative technologies in their retail industry to attract consumers. The present study also recommends that traditional retailers improve their strategies for tackling the issues faced in digital shopping. This paves the way for online retail marketers to compete.

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The influence of personality and desires on motivation for selecting tourist destinations

La influencia de la personalidad y los deseos en la motivación para seleccionar destinos turísticos

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ABSTRACT

The present study aims to analyze the relationship between a tourist's personality traits and the diverse motivational factors that guide their selection of a travel destination. To conduct this research, we adopted a quantitative, cross-sectional approach, collecting information through a survey involving 384 participants in Quito. The results revealed that potential tourists consider various factors, including their needs, desires, available offerings, and personality traits when choosing a destination. However, it was established that personality traits do not significantly influence tourism needs and offerings. Furthermore, desires do not serve as direct or indirect mediating variables between needs and offerings. In conclusion, an individual's personality does not necessarily dictate motivation when selecting a tourist destination. This study provides a comprehensive view of how psychological and motivational factors interact in the complex decision-making process within tourism.

Keywords: Need; tourist offer; personality traits; desire; motivation; psychological

JEL code: L83; D12; M31.

RESUMEN

El presente estudio tiene como objetivo analizar la relación entre los rasgos de personalidad de un turista y los diversos factores motivacionales que guían su selección de un destino de viaje. Para realizar esta investigación, adoptamos un enfoque cuantitativo y transversal, recopilando información a través de una encuesta que involucró a 384 participantes en Quito. Los resultados revelaron que los turistas potenciales consideran varios factores, incluidas sus necesidades, deseos, ofertas disponibles y rasgos de personalidad, al elegir un destino. Sin embargo, se estableció que los rasgos de personalidad no influyen significativamente en las necesidades y oferta turística. Además, los deseos no sirven como variables mediadoras directas o indirectas entre necesidades y ofertas. En conclusión, la personalidad de un individuo no necesariamente dicta la motivación a la hora de seleccionar un destino turístico. Este estudio proporciona una visión integral de cómo interactúan los factores psicológicos y motivacionales en el complejo proceso de toma de decisiones dentro del turismo.

Palabras clave: Necesidad; oferta turística; rasgos de personalidad; deseo; motivación; psicológico

Código JEL: L83; D12; M31.

INTRODUCTION

Motivation, often described as a causal force, significantly influences the behavior of consumers and tourists when they make decisions about purchasing products or services. According to Martínez et al. (2022), this motivational impulse arises from a combination of internal (push) and external (pull) factors that exert their influence on an individual's behavior. To gain a deeper understanding of the driving forces behind consumer motivation, existing literature highlights several internal variables that shed light on tourist behavior from a psychological perspective (Liu, 2023).

One such alternative is the consideration of theoretical variables related to needs (Devesa et al., 2010; Chen et al., 2022). These needs align with Maslow's hierarchy and include physiological, safety, social, esteem, and self-actualization needs (Hernández, 2021; Castro, 2018). Another relevant theory, proposed by Edwin Locke (Locke & Latham, 2002), emphasizes the role of motivation in achieving objectives. This theory explores the intention to fulfill goals or desires as a fundamental motivation source guiding an individual's actions (Barberá, 2002).

Secondly, to comprehend the aspects of attraction that impact an individual's motivation, Devesa et al. (2010) emphasize the need to analyze external factors that influence purchasing behavior. This analysis is based on the characteristics of the products and services. Motivation is closely tied to a destination's existing tourist offerings in tourism.

According to Nasimba and Cejas (2015), motivation is not the sole factor influencing an individual's behavior; other variables, such as age, income, and personality traits, also play significant roles. In particular, empirical studies conducted by García and Moral (2022) and Bano et al. (2019) have revealed a substantial relationship between certain personality traits or behavioral profiles at the psychological level and consumer motivations.

This research highlights the importance of considering personality traits within the context of consumer behavior. These traits are part of the well-known "Big Five model" initially proposed by Lewis Goldberg in the 1980s. The five key personality dimensions include openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. (Ruiz, 2003; Soliño and Farizo, 2014). Medina's studies (2016) shed light on the limited number of literary contributions that specifically analyze the influence of personality traits on individual motivations (both needs and desires) as well as motivations associated with the attributes of a destination (offer). Understanding these connections is crucial for developing effective marketing strategies and enhancing the tourism experience.

For García and Moral (2022) or Bano et al. (2019), individuals with extraverted personality traits (extroverted/energetic vs. lonely/reserved) seek out spaces to strengthen relationships with others. Their motivation tends to lead them toward places where they can experience adventurous activities with fellow people. However, this decision-making process varies for individuals with different personality traits (Barra et al., 2019). Their interests span a wide range, including seeking unique experiences, taking things easy, distancing themselves from others, finding places for rest, pursuing personal growth, and engaging in intellectually stimulating activities.

Given this scenario, the research problem arises from the need to delve deeper into the relationship between personality and motivation, particularly within the context of Quito tourism.

This study aims to understand how an individual's personality traits influence motivation when selecting a tourist destination and shaping their desires. To achieve this goal, we consider two critical variables that define motivation and significantly impact an individual psychologically: internal needs and external supply. By gathering information through this study, we establish a theoretical foundation to inform the design of targeted campaigns and advertisements for audiences with shared or individual interests. This optimization of resources and time allows for the creation of tailored offers suitable for specific tourist profiles.

THEORY DEVELOPMENT

Consumer behavior

Consumer behavior is a systematic process that occurs within an individual while purchasing a product or service to fulfill a need. Researchers Hoyer et al. (2015) and Espinel et al. (2019) have explored this phenomenon. In tourism, destinations and companies striving to develop effective marketing strategies must consider the diverse factors influencing an individual's purchasing behavior related to tourism products and services.

Understanding consumer behavior poses a significant challenge for marketing and sales professionals. The multifaceted nature of consumer behaviors, coupled with the ever-evolving market dynamics, constrains the effective formulation of commercial strategies that drive company growth and enhance the market presence of their products or services (Díaz, 2012).

Consumer behavior, as discussed by Kotler and Armstrong (2012) and referenced by Salazar (2020) and Moreno et al. (2022), is influenced by a multitude of factors. To devise effective marketing strategies tailored to individual consumer profiles, these factors must be analyzed

independently and collectively. Critical criteria include cultural aspects (such as culture, subculture, and social class), personal characteristics (including age, occupation, and personality), social influences (such as reference groups, family, and roles), and psychological factors (such as motivation, perceptions, learning, and beliefs).

Motivation as a psychological aspect of consumer behavior

According to Durmaz (2014) and Ramírez et al. (2022), the human being is an intricate and unpredictable entity shaped by many variables that demand analysis from a psychological perspective. We must draw upon various disciplines, including psychiatry, chemistry, biology, and anthropology, to gain deeper insights. Consequently, the study of human beings spans diverse domains, adapting to their multifaceted needs—ranging from social and educational contexts to labor, marketing, and political arenas.

At the social level, psychology dedicates itself to studying and analyzing human behavior within society. Researchers focus on the factors influencing behavior, feelings, and thoughts (Molina et al., 2023). Meanwhile, marketing delves into the processes of consumer behavior, aiming to understand preferences and consumption patterns. In today's information-rich landscape, where abundant data about products and services circulate through various media channels, the point of contact with the consumer becomes pivotal (Sare & Hallo, 2021).

Within this context, the significant challenge at the marketing level lies in comprehending which psychological aspects—such as motivation, lifestyle, perception, beliefs, and learning—play a pivotal role in effectively developing commercial activities within tourism (Pan et al., 2024).

Authors like Hoyer et al. (2015) and Salazar (2021) have demonstrated that a tourist's or consumer's behavior can be psychologically influenced by various factors, including motivation, learning, attitude, and perceptions related to products and services (Solakis et al., 2022). Our study focuses on motivation as a central axis for understanding tourist behavior from a psychological standpoint. Specifically, we aim to explore how personality traits influence motivation.

By unraveling these connections, we can inform marketing strategies tailored to individual profiles, ultimately enhancing the tourism experience.

Motivation

The concept of "motivation" plays a pivotal role in consumer decision-making, especially regarding travel and tourism. It represents a dynamic force that develops within an individual when they seek to fulfill specific needs (Martínez et al., 2022). In essence, motivation acts as a stimulus variable significantly influencing purchasing choices.

According to Mediano (2002) and Pan et al. (2024), tourist behavior is influenced by both psychological push criteria and attraction-based (pull) factors. These factors play a crucial role in shaping an individual's desire to travel and ultimately impact their choice of destination.

On this topic, Devesa et al. (2010) provide a more lucid explanation of how motivation is generated in tourists, focusing on the following aspects:

Internal Variables (Push Factors): These variables are determined by intrinsic needs and desires. They include Rest (the desire for a tranquil and rejuvenating experience), adventure (the urge to explore new places and engage in exciting activities), and social Interaction (the need for social connections during travel).

External Variables (Pull Factors): These factors are influenced by the destination itself and its offerings. They encompass Attractions (the unique features, landmarks, and points of interest in a place), recreational infrastructures (facilities and amenities for leisure and entertainment), and cultural and Natural Settings (the richness of cultural heritage and the natural environment).

Necessity as a push factor

The concept of 'need' has been extensively studied to understand its origins in human beings and how individuals strive to fulfill them. Abraham Maslow's well-known hierarchy of needs theory defines these needs as essential deficiencies for human well-being. These needs span various dimensions: physiological, security, social, esteem, and self-actualization. Individuals prioritize and satisfy these needs based on their level of importance (Díaz, 2012; Durmaz, 2014).

From an educational perspective, Rojas (2021) explores how meeting needs impacts learning outcomes. Spiritually, Bayes and Borrás (2005) delve into the connection between needs and inner fulfillment. Economically, Cobedo (2020) investigates how needs influence consumer behavior.

In the context of tourism, researchers like Arce et al. (2020) and Chen et al. (2022) argue that tourists' needs are met through available tourism products and services. Fonseca and Estela (2020) highlight that contemporary tourists seek cultural experiences, sustainability values, and seamless technological integration. Ultimately, this variable significantly influences tourists' destination choices as they look for places and stories they can share and pass on.

The offer of tourism products and services as a pull factor

Naranjo and Martinez (2022) highlight that research evaluating tourism offers valuable insights into a destination's social, economic, and environmental development. By understanding the tourism market dynamics, destinations can adapt to new challenges and enhance their products and services. This responsiveness is crucial in the ever-evolving context of tourism (Ab Dulhamid, 2022).

As discussed by Arce et al. (2020), tourism products or services emerge organically in specific locations. When we refer to a tourist product, we encompass any resource (such as beaches, mountains, forests) that integrates various tourist services (transport, accommodation, travel guides). These services cater to tourists' preferences, which span diverse categories: sun and beach, sports and adventure tourism, cultural experiences, ecotourism, and community-based tourism. To meet demand effectively, it is essential to structure tourism resources based on quality and value. These resources act as pull factors, motivating tourists to visit a place and immerse themselves in unique service experiences. Considerations must extend to natural elements, cultural offerings, and human activities that contribute to the overall appeal of a destination.

Personality traits as a personality variable

Personality is a fascinating field within psychology. Researchers aim to understand how distinct traits shape an individual's day-to-day decisions (Guzmán & Salamanca, 2021). Crespo and Soria (2019) emphasize that personality plays a crucial role in consumer behavior. Researchers estimate a strong correlation between an individual's personality type (personality traits) and their preferred products.

One widely used model for studying personality is the Five Factor Model, the Big Five. This model comprises five fundamental dimensions or traits that provide insights into consumer behavior:

a) Openness to Experience: Individuals high in openness are curious, creative, and willing to explore the unknown. They appreciate aesthetics, fantasy, and novel ideas. Their values may include re-examining social, religious, or political norms (Soliño & Farizo, 2014; Sanchez, 1995; Arévalo et al., 2019).
b) Extraversion: Extraverts thrive on social interactions. They are cordial, gregarious (preferring company), assertive, and seek stimulation. Positive emotions, such as happiness and joy, characterize their experiences (Sánchez, 1995; Arévalo et al., 2019).
c) Conscientiousness: This trait reflects organization, discipline, and responsibility. Conscientious individuals set goals, exhibit competence, maintain order, and have

a strong sense of duty. They aspire to achieve and practice self-discipline (Ruiz, 2003).

d) Agreeableness: Agreeable individuals are cooperative, empathetic, and compassionate. They value harmony, avoid conflicts, and prioritize relationships. Their interactions are characterized by kindness and understanding.
e) Neuroticism: High neuroticism indicates emotional instability. Individuals with this trait experience anxiety, mood swings, and stress. They may be more sensitive to negative emotions and perceive threats easily.

Understanding these personality traits helps marketers tailor products, services, and marketing strategies to specific consumer segments. By recognizing how personality influences preferences and decision-making, businesses can create more effective campaigns and enhance customer satisfaction.

Desire as a mediating variable

The conceptualization of desire has received limited attention in contemporary literature and is often mentioned superficially without in-depth exploration. According to the Dictionary of the Spanish Language, desire is defined as an "affective movement toward something that is desired" (Real Academia Española, 2024). In simpler terms, desires represent what we yearn to have or achieve, driven by our needs. Notably, a close relationship exists between desires and goals (Barberá, 2002).

Acerenza (2003) contends that desires and needs play a pivotal role in shaping various types of tourism. These desires manifest in diverse ways: cultural tourism (the willingness to explore new places, immerse in local culture, and gain insights into history, art, and traditions); sun and beach tourism (the longing for relaxation, warm climates, and coastal experiences, often associated with leisure and recreation); ecotourism (a desire to connect with nature, appreciate biodiversity, and engage in sustainable practices); other desires (these may include seeking adventure, culinary experiences, or spiritual encounters).

From this perspective, the interplay between desires and tourism is a motivating factor in selecting a destination (Gonzalez et al., 2023). Travelers seek places that align with their desires, whether discovering cultural gems, basking in the sun, or exploring pristine natural landscapes.

Structuring of the study variables

Table 1 presents the parameters for conducting this research and collecting relevant information to achieve the stated objective. Notably, the table captures motivation-related dimensions, including desires and personality traits.

Table 1. Dimensions and indicators of the tourist's motivation, desire, and personality

Variables	Code	Dimension	Code	Indicator	Code
Motivation	MOT	Tourist needs (push factor)	NEE	Physiological or vital needs	NEE1
				Security Needs	NEE2
				Social Needs	NEE3
				Appreciation Needs (esteem and notoriety)	NEE4
				Needs Transitive Self-Actualization	NEE5
		Offer (Pull Factor)	OFE	City tourism	OFE1
				Nature tourism	OFE2
				Wellness tourism	OFE3
				Cultural tourism	OFE4
				Sun and beach tourism	OFE5
				Shopping tourism	OFE6
Desire	DES	Desire	DES	Desire for a product	DES1
				Desire over price	DES2
				Desire about location	DES3
				Desire about promotion	DES4
				Personal desire	DES5
Personality	PER	Personality traits	PET	Openness to experience	PET1
				Extraversion	PET2
				Conscientiousness:	PET3
				Agreeableness	PET4
				Neuroticism	PET5

Source: adapted from Devesa et al. (2010)

Source: adapted from Devesa et al. (2010).

Building upon the established variables, we have formulated the following hypotheses for our study:

H1: Personality traits significantly impact the push factor of motivation, which is defined by tourist needs.
H2: Personality traits significantly influence the pull factor of motivation, which is shaped by the existing tourist offerings.
H3: Individual personality traits directly influence a tourist's desires.
H4: Tourist needs to play a role in shaping their desires.
H5: The available offerings at a destination influence a tourist's desires.

METHODOLOGICAL ANALYSIS

For the development of this study, we have chosen a quantitative approach to investigate whether personality traits influence tourist motivation (Sánchez, 2019). To achieve this, we conducted quantitative, non-experimental, descriptive, and correlational research at a cross-sectional level. This approach allowed us to describe, analyze, and contrast the relationship between personality traits and tourist motivation (Guevara et al., 2020; Cvetkovic-Vega et al., 2021)

Population context

For this study, we needed to collect information from a population whose profile consists of individuals older than 20 years residing in Quito, Ecuador. Given that the population size exceeds 100,000 units, we calculated a sample size using a statistical formula for infinite populations (Hernández & Carpio, 2019). The following criteria were considered for this calculation: an error margin of 5%, a proportion of 50%, and a confidence level of 95%. As a result, the sample size for this study was determined to be 384 participants.

Data collection and measurement of variables

The technique used to collect information for this study was a survey (Feria et al., 2020), which participants completed in a self-administered manner (Noy, 2008). The questionnaire gathered general sociodemographic information about sex, age, daily activity, and monthly income. Additionally, participants were asked to identify their personality traits based on the following criteria: openness to experience, conscientiousness, extraversion, agreeableness, or neuroticism.

Furthermore, we explored various criteria that can influence tourist motivation to travel, focusing on two dimensions: needs and existing offers. We also included the desired variable as a mediating factor.

We used nominal measurement scales for sociodemographic variables and personality traits. For assessing motivation and desire, we employed a 5-point Likert scale, where 5 corresponds to “totally agree,” 4 corresponds to “agree,” 3 corresponds to “neither agree nor disagree,” 2 corresponds to “disagree,” and 1 corresponds to “strongly disagree” (Arribas, 2004). The entire sample's data collection occurred officially between November and December 2023.

Data analysis

For the data analysis stage, a study of the sample distribution was first considered to identify the profile of the participants who contributed information to this research. The variables considered were personality traits, needs, desires, and offers. Afterward, a content validity analysis was carried out using Cronbach's alpha; this test was performed to observe if the measuring instrument used in this research measured what it intended to measure (Quero, 2010).

An exploratory factor analysis (EFA) was also considered to explore the observed variables' underlying dimensions, constructs, or latent variables more precisely. This last analysis confirmed that it meets the minimum requirements for its development: a sample size of more than 300 cases and the degree of determination of the factors (Mavrou, 2015). The optimal recommendation is a minimum of 100 cases and the number of variables per factor (dimension) from 3 to 4 items (Lloret et al., 2014).

To test the model, a confirmatory factor analysis (CFA) was considered to identify those variables (indicators) that do not contribute to the proposed measurement model and corroborate the results of the TFA. Through this analysis, the initial hypotheses were also corroborated for those that aim to verify the relationship or effect generated between two variables and for those where a mediating variable is included (Ramírez & Polack, 2020).

RESULTS

This section presents the results obtained from data collection and their corresponding analyses.

Descriptive results of the sample and exploratory factor analysis

The initial results from this study, as presented in Table 2, were obtained using the SPSS version 19 statistical program. These results provide descriptive data on the profile of the Quito participants who contributed to this study. Notably, the participant pool exhibits a diverse sociodemographic profile, with significant contributions from women, public employees, and individuals earning an average salary between $501 and $1000.

Table 2. Sample Overview

Criterion	Scale	Frequency	Percentage
Gender	Male	169	44,0
	Female	215	56,0
Age	20 to 24 years old	46	12,0
	25 to 29 years old	54	14,1
	30 to 34 years old	47	12,2
	35 to 39 years old	47	12,2
	40 to 44 years old	77	20,1
	45 to 49 years old	43	11,2
	50 to 54 years old	40	10,4
	55 to 59 years old	17	4,4
	Over 60 years old	13	3,4
Daily activity	Retiree	14	3,6
	Student	66	17,2
	Enterprising	69	18,0
	Public employee	66	17,2
	Private employee	176	45,8
	Unemployed	11	2,9
	Housewife	41	10,7
Monthly income	Less than $500	78	20,3
	Between $501 to $1000	142	37,0
	Between $1001 to $1500	60	15,6
	Between $1501 to $2000	24	6,3
	Over $2000	40	10,4
	I have no income	40	10,4
Personality traits	Openness to experience	148	38,5
	Extraversion	25	6,5
	Conscientiousness:	86	22,4
	Agreeableness	92	24,0
	Neuroticism	33	8,6

Note: Frequency and percentage values based on 384 respondents

Source: Own elaboration.

About personality traits, as indicated in Table 3, the most prominent trait among the participants is 'openness to experience' (38.5%), followed by 'agreeableness' (24%) and 'conscientiousness' (22.4%). However, traits associated with neuroticism (8.6%) or extraversion (6.5%) received very low scores below the average. Based on these findings, most quiteños (residents of Quito) with a high openness to experience tend to seek out destinations that offer interesting and unexpected tourist activities, providing them with new and enriching experiences. Additionally, they appreciate places where cordial service is provided.

Table 3. Description of the personality traits of the sample

Criterion	Scale	Frequency	Percentage
Personality traits	Openness to experience	148	38,5
	Extraversion	25	6,5
	Conscientiousness:	86	22,4
	Agreeableness	92	24,0
	Neuroticism	33	8,6

Note: Frequency and percentage values based on 384 respondents

Source: Own elaboration.

Regarding the variables considered for the proposed measurement model, the results obtained from the information reflected in Table 4 are as follows:

Descriptively, all the items within the 'needs of tourists' dimension consistently received a mode of 5. Notably, the need for safety and protection (NEE2) stood out, generating the highest sum and exhibiting the least standard deviation. This finding suggests that while tourists may have diverse needs, their primary concern is seeking a tourist destination that offers security. Safety emerges as a pivotal factor, holding greater importance than other considerations.

Similarly to the previous dimensions, the values obtained for the 'tourist offer' consistently showed a mode of 5. This indicates a balanced interest across all tourism products or services destinations can provide. However, among these options, city tourism alternatives (OFE1) are most widely accepted by tourists, whereas shopping tourism (OFE6) is less favored.

On the other hand, it's worth noting that some arithmetic mean values fell below 3.8. This suggests that a significant percentage of people do not consider wellness tourism (OFE3) or shopping tourism (OFE6) as their preferred alternatives. The standard deviation further supports these findings, revealing very high variability in responses.

Regarding 'desires' most of the indicators obtained a mode of 5, demonstrating the participants' high degree of approval. However, there was an exception with the price variable (DES2). It was revealed that tourists are willing to visit destinations regardless of the costs associated with transportation, accommodation, food, or attractions—provided these expenses align with their expectations. On the other hand, the desire that received the highest

value was personal desire (DES5). This desire is expressed by tourists seeking destinations that allow them to rediscover or reconnect with themselves.

Finally, considering the theoretical reference that suggests Cronbach's alpha should fall between 0.7 and 0.9 for a reliable measurement scale (Cronbach, 1951), our study yielded the following results: Entire Motivation Variable: Cronbach's alpha = 0.913. This indicates high reliability for the entire motivation variable across the 16 indicators. Separate Dimensions: Need Dimension (Cronbach's alpha = 0.879), Desire Dimension (Cronbach's alpha = 0.809), Offer Dimension (Cronbach's alpha = 0.792). These values affirm the reliability of each indicator.

Table 4. Description of the variables and measurement of the reliability of the scale

Variable	Dimension	Indicator	Mode	Sum	Mean	Standard deviation	Mean	Cronbach's Alfa	Cronbach's Alfa if the element is removed
MOT	NEE	NEE1	5	1725	4,49	0,988	4,36	0,879	0,861
		NEE2	5	1750	4,55	0,951			0,847
		NEE3	5	1617	4,21	1,066			0,856
		NEE4	5	1634	4,25	1,065			0,854
		NEE5	5	1653	4,30	1,107			0,844
	OFE	OFE1	5	1647	4,28	1,070	4,04	0,792	0,756
		OFE2	5	1601	4,16	1,100			0,766
		OFE3	5	1470	3,82	1,203			0,741
		OFE4	5	1605	4,17	0,975			0,745
		OFE5	5	1630	4,24	1,073			0,780
		OFE6	5	1356	3,53	1,290			0,773
DES	DES	DES1	5	1605	4,17	1,115	3,96	0,809	0,755
		DES2	3	1320	3,43	1,235			0,802
		DES3	5	1612	4,19	1,050			0,751
		DES3	5	1445	3,76	1,312			0,784
		DES5	5	1625	4,23	1,084			0,765

Source: Own elaboration.

To assess the suitability of applying factor analysis, we examined two key indicators: Kaiser-Meyer-Olkin Index (KMO): The KMO index should ideally reach a value of ≥ 0.8. In our study, the KMO value obtained was 0.879, indicating that the data is suitable for factor analysis. Bartlett's Sphericity Test: Bartlett's test assesses the level of correlation among variables. A p-value less than 0.05 is desirable for this test. In our case, the Bartlett sphericity test yielded a p-value of 0.000, further supporting the suitability of factor analysis.

Subsequently, we conducted an Exploratory Factor Analysis (EFA). Table 5 presents the relationship between motivation indicators, grouping them into two motivational factors: Push Factors (Needs) (These are determined by internal variables. They drive motivation), Pull Factors (Offer) (These are influenced by external variables. They also contribute to motivation). These findings align with Devesa et al.'s (2010) position that both internal and external factors shape motivation.

Table 5. Matrix of Components by Construct (Rotated Factors)

Variable	Dimension	Indicator	Push factors	Pull factors
			Needs	Existing Offer
MOT	NEE	NEE1	0,783	
		NEE2	0,873	
		NEE3	0,596	
		NEE4	0,580	
		NEE5	0,617	
	OFE	OFE1		0,541
		OFE2		0,469
		OFE3		0,778
		OFE4		0,597
		OFE5		0,414
		OFE6		0,569

Note: values obtained by maximum likelihood

Source: Own elaboration.

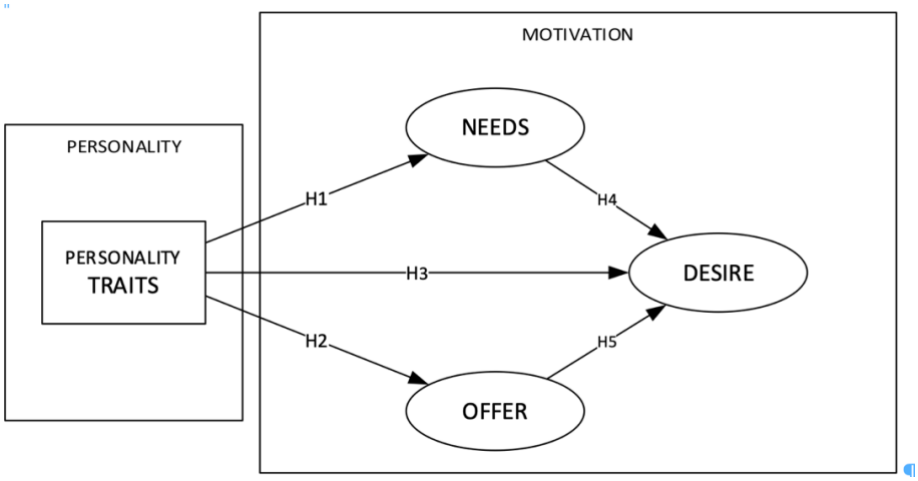
Results of Confirmatory Factor Analysis

After obtaining satisfactory indices from the Exploratory Factor Analysis, we proceeded with the Confirmatory Factor Analysis (CFA). For this purpose, we utilized AMOS version 26 software, employing the maximum likelihood method. The following steps were carried out and evaluated: specification of the model considered and identification, estimation of parameters, fit Evaluation, re-specification of the model, and interpretation of the obtained results (Medrano & Muñoz, 2017).

Model Analysis

a) **Specification of the model considered and identification of the model**: Figure 1 presents the measurement model proposed for this research. It encompasses three dimensions: need, offer, and desires, which are contrasted with the variable of personality traits. According to the AMOS program, there are a total of 115 degrees of freedom, allowing for estimation and contrast (Medrano & Muñoz, 2017).

Figure 1. Proposed measurement model



Source: Own elaboration.

b) **Model estimation**: For this study, we employed the maximum likelihood estimation method to analyze and calculate various estimates. These estimates include:
   I. Standardized Regression Coefficients: These coefficients allow us to compare the effects of different predictor variables on the response variable. They are unitless and indicate how many standard deviations the dependent variable changes per standard deviation increase in the predictor variable.
   II. Coefficients of Determination (R^2): R^2 measures how well a statistical model predicts an outcome. It ranges from 0 to 1, with higher values indicating better prediction.
   III. Indirect Effects: These represent the pathways through which intervening variables transmit effects from causal variables to outcome variables.
   IV. Direct Effects: These capture the direct relationship between the independent and dependent variables, excluding mediation through intermediate variables.
   V. Total Effects: The total effect combines direct and indirect effects to explain the overall relationship between variables.

c) **Evaluation of the model:** At this stage, we assessed whether the relationships between the variables in the estimated model accurately reflect the observed data. To achieve this, we evaluated whether the model fits the proximate acceptability criteria. Specifically, we considered the following criteria:
   I. Root Mean Square Error of Approximation (RMSEA): RMSEA should be less than 0.05.
   II. Comparative Fit Index (CFI): CFI should be greater than or equal to 0.95.
   III. Goodness of Fit Index (GFI): GFI should exceed a cut-off point 0.89.
   IV. Normed Fit Index (NFI): The NFI should be greater than 0.90 (Jordán, 2021).

The initial results of this model, using the TFA (Theoretical Framework Analysis), yielded the following absolute adjustment indices:

- Chi-Square (X^2): 773.378, Degrees of Freedom (df): 115, p-Value: 0.000, RMSEA: 0.122
- The incremental adjustment indices were CFI: 0.788, GFI: 0.810, and NFI: 0.761.

These indices provide insights into the model's goodness of fit. While some values fall short of the ideal criteria, they still offer valuable information for model evaluation.

d) **Re-specification of the model:** While these recent values do not precisely match or exceed the acceptability criteria, they still yield results that align well with the theoretical recommendations. Considering the existing level of relationship, further adjustments to this model are unnecessary.

e) **Relationship analysis:** In this section, we delve into the relationship analysis by examining the variance within the measurement model for each dimension. Theoretical principles guide our interpretation of these variance values:

a. Low Variance: When variance is low, it suggests that the data points are generally clustered around the mean. In other words, there is less variability among the values.
b. High Variance: Conversely, high variance indicates greater dispersion among the data points. They deviate more significantly from the mean.

Considering the data collected and organized for this study, the variance values for each dimension are as follows: Needs (NEE): Variance = 0.000 (Low), Offer (OFE): Variance = 0.010 (Low), Desire (DES): Variance = 0.783 (High), Personality Trait (PET): Variance = 0.000 (Low).

The first two dimensions (needs and offer) exhibit low variance, indicating less variability among participants' responses. In contrast, the desire dimension shows high variance, suggesting significant dispersion in participants' desires.

Similarly, personality traits also exhibit low variance, implying consistency in participant responses.

Relationship Analysis and Hypothesis Testing

When considering relationship values, it is essential to adhere to theoretical principles of estimation. Ideally, these values should approach 1. Additionally, according to Calvo (2017), each relationship should yield a standardized coefficient (λ) and covariance (E) greater than 0, preferably exceeding 0.5. Furthermore, a critical ratio (C.R.) greater than 1.96 and a p-value less than 0.05 indicate statistical significance.

As observed in Table 6, the values obtained from the AMOS program and the estimation considerations reveal varying relationships. Some relationships meet the minimum acceptance criteria, while others do not. Based on the initially formulated hypotheses, we can draw the following conclusions:

Accepted Hypotheses:

H4: Needs significantly influence tourists' desires.
H5: The existing offerings of a destination significantly impact tourists' desires.

Rejected Hypotheses:

H1: Personality traits do not significantly influence tourists' needs.
H2: Personality traits do not significantly influence the existing tourist offer.
H3: Desires do not act as mediating variables between personality traits and either tourist needs or the existing offer.

Table 6. Hypothesis testing through the TFA

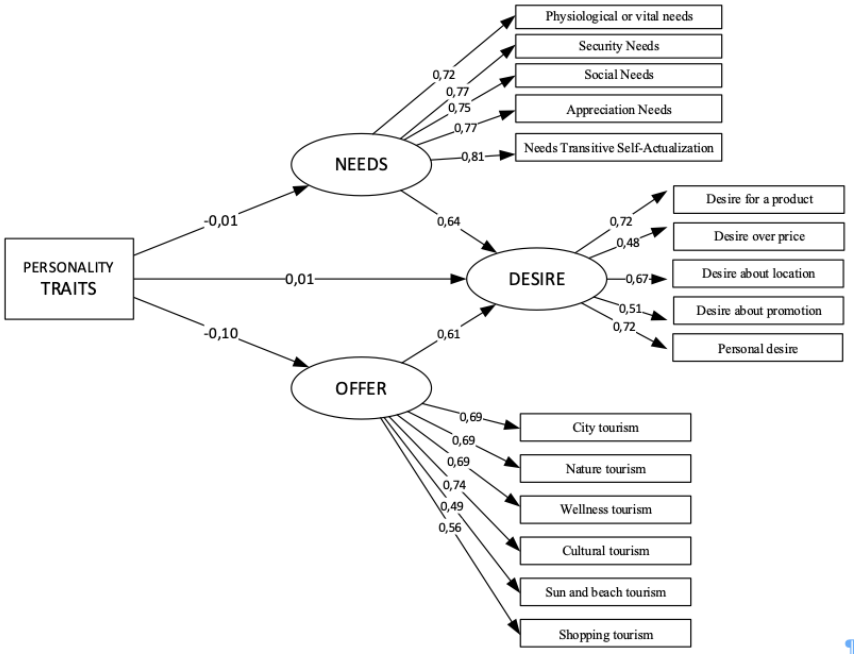
Hypothesis	λ	E	S.E.	C.R.	P	Conclusion
H_1: PET → NEE	-0,007	-0,003	0,027	-0,124	-0,901	Rejected
H_2: PET → OFE	-0,099	-0.051	0,030	-1,277	0,084	Rejected
H_3: PET → DES	0.007	0,003	0,021	0,158	0,875	Rejected
H_4: NEE → DES	0,641	0,662	0,072	9,238	***	Accepted
H_5: OFE → DES	0,610	0,607	0,070	8,724	***	Accepted

Note: Standardized coefficient λ = >0.5; E=Estimated covariance; SE=standard error; CR=critical value >1.95; P=p–value<0.05 or ***<0.001; PET=personality traits; NEE = tourist needs; OFE= tourist offers; DES=desires

Source: Own elaboration.

From the same information, Figure 2 provides a more detailed view and complete values for the standardized coefficients obtained for each dimension considered in this study. Additionally, it illustrates the degree of relationship between these coefficients and their respective indicators.

Figure 2. Final Measurement Model



Source: Own elaboration.

Analysis of the model considering personality traits as a mediating variable

The correlation results shown above show a direct connection between the two variables. However, they do not show the degree of relationship when a third variable is involved. In this sense, in order to strengthen the study, from now on, a new analysis of the proposed measurement model is proposed to study what is the cause-effect that is generated between two variables directly or indirectly when there is the presence of a third variable that acts as a mediator; In this aspect, the values obtained in the previously presented relationship are discarded, and new relationships are formulated and calculated.

In essence, the model now considers the relationship that exists when desires (DES) function as a mediating variable between the criterion variable personality trait (PET) and the predictor variables needs (NEE) and offer (OFE), respectively (as depicted in Figure 3). We formulated the following hypotheses:

H6: Personality traits positively influence tourism needs when desires act as a mediating variable.

H7: Personality traits positively impact tourists' decisions regarding available offerings when desires act as a mediating variable.

Figure 3. Cause-effect relationship in the presence of a mediating variable

Source: Own elaboration.

To conduct this type of analysis, our study followed the guidance of Sanz (2014), who emphasizes three essential conditions for mediation analysis:

- Relationship Between Predictor (X) and Mediator (M): The predictor or independent variable (X) must be related to the mediating variable (M).
- Relationship Between Mediator (M) and Criterion (Y): The mediating variable (M) should be associated with the criterion or dependent variable (Y).
- Significant Relationship Between Predictor (X) and Criterion (Y): Initially, there should be a significant relationship between the predictor variable (X) and the criterion variable (Y). However, this significance may diminish or disappear once the mediating variable is introduced.

In this context, to verify whether these three conditions are met, the statistical program employed for this proposed measurement model produced the following results:

- Between a) PET →NEE (r=0.034 - p=0.386); b) PET →DES (r=-0.048 - p=0.388); c) DES →NEE (r=0.834 - p=0.001)
- Between a) PET →OFE (r=-0.055 - p=0.186); b) PET →DES (r=-0.048 - p=0.388); c) DES →OFE (r=0.846 - p=0.001)

Unfortunately, as evident from these values, some relationships do not meet the conditions necessary for mediation. Specifically, proceeding with the mediation analysis is irrelevant since no significant values (p-values) were observed. However, to demonstrate this lack of mediation, we further examined which values do not contribute to answering the H6 and H7 hypotheses formulated earlier, thereby impacting the development of the mediation analysis.

Table 7. Mediation Analysis

Hypothesis	Total coefficient	p-value	Direct coefficient beta	p-value	Indirect coefficient beta	p-value	Observed mediation
H_6: PET→DES→NEE	-,0,007	0,910*	0,034	0,305*	-0,040	0,516*	None
H_7: PET→DES→OFE	-0,096	0,155*	-0,055	0,204*	-0,041	0,500*	None

Note: PET=personality traits; NEE=tourist needs; OFE=tourist offers; DES=desires; *=No significance

Source: Own elaboration.

As observed in Table 7, the results based on the two assumptions considered for this study (H6 and H7) indicate that no significant p-values below 0.05 were found—either directly or indirectly. This corroborates the absence of a significant relationship between the predictor and criterion variables when the desire variable acts as a mediator. Consequently, this test leads to the rejection of hypotheses H6 and H7.

DISCUSSION

Based on the obtained results, several important aspects can be identified. First and foremost, consumer behavior is influenced by various external and internal factors that impact purchasing decisions regarding products or services. Motivation plays a crucial role in this context from a psychological perspective. This fact has been corroborated in various studies taking into account multiple motivations, such as well-being (Ahn & Kim, 2024), religious tourism (Carvache, 2024), cultural destinations (Parreira et al., 2021) or natural (Mzimela et al., 2024).

Specifically, the descriptive results from this study reveal that the residents of Quito exhibit strong motivation to visit tourist destinations based on their needs and the available offerings. Push factors (such as personal preferences) and pull factors (such as the appealing features of the destination) contribute significantly to this motivation. Interestingly, these findings

closely align with those Medina (2016) reported in a different geographical context, such as Gran Canaria.

Secondly, regarding the indicators considered for each of the variables mentioned earlier, exploratory factor analysis revealed the existence of motivational aspects that can be categorized as both 'push' and 'pull' factors, as they argue (Martínez-Cañas et al., 2023). This finding aligns with the perspectives of Mediano (2002), Devesa et al. (2010), and Vanegas and Santa (2024). Specifically, it highlights that tourists' behavior is influenced by psychological push criteria, which ignite an individual's desire to travel. Additionally, pull factors—cultural or otherwise—play a significant role in determining the choice of one destination over another.

Thirdly, based on the initially formulated hypotheses regarding the H1 hypothesis, the results indicate that personality traits do not significantly impact tourists' needs. While personality traits naturally vary among individuals, they do not play a substantial role in motivating tourists. Instead, specific needs related to tourism drive people to explore new places and embark on travel experiences. In light of this rejection of the hypothesis, Medina (2016) proposed that such results can emerge in various research studies conducted across different human contexts. This prompts several intriguing questions for future investigation: Why did the personality traits of Quito natives not influence their needs? What underlying factors contributed to these results?

Concerning the H2 hypothesis, we aimed to analyze whether personality traits significantly influence the pull factor of motivation, defined by the existing tourist offer. However, this study led to the rejection of the hypothesis. Despite personality traits being unique to each individual, they play a significant role in shaping the attraction of tourist offerings. Consequently, the availability and quality of tourism options emerge as critical factors influencing travelers' decisions. These findings align with those of Medina (2016), who demonstrated an association between personality and preferences in various tourist activities—a factor significantly impacts tourist motivations. Based on this information, it becomes evident that formulating proposals for improving the current tourist offerings is of utmost importance.

About the H3 hypothesis, the study did not provide evidence that personality traits significantly influence tourists' desires. While personality traits are not the sole determinants of these desires, they do not automatically dictate which destinations or tourist experiences qualify as travel intentions. However, it remains crucial for tourism-oriented destinations or companies to consider personality traits when designing marketing strategies. They can effectively engage potential travelers by tailoring their tourism campaigns to address different segments' individual needs, as Barzola et al. (2019) and Chen et al. (2022) suggested. Additionally, this approach allows us to explore the tourist's personality from

perspectives beyond the consumer's psychological processes—such as social and cultural factors.

Regarding the H4 and H5 hypotheses, the study demonstrated that specific tourist needs directly impact desires, and consequently, the tourist offerings also influence desire formation. As a result, we can accept both of these hypotheses. These findings align with studies such as those conducted by Naranjo and Martinez (2022), which emphasize the need for adapting the tourist offerings to meet the evolving demands of tourists. Additionally, Acerenza (2003) postulates that desires and needs give rise to various tourism experiences. In this context, travelers, tourists, and consumers have become adept at making informed decisions. They evaluate the potential opportunities and threats different destinations present, aiming to minimize challenges or barriers they might encounter during their journeys. These challenges can be technical or practical, such as communication, accessibility to products/services, or infrastructure availability.

Furthermore, tourists' decisions are influenced by their character. Their personality shapes their initial ideas about the type of tourism experience they seek. Contreras and Vargas (2021) support this perspective, asserting that a person's character is malleable and can adapt to new situations and changes.

In summary, while a person's traits—such as openness to experience, conscientiousness, extraversion, agreeableness, or neuroticism—serve as valuable tools for understanding how they might influence consumer decisions, studies have revealed that these traits are not directly related to various motivational factors. In the context of this study, confirmatory factor analysis tests demonstrated no significant relationship between these personality traits and the following aspects: Needs (H1): Personality traits do not significantly impact tourists' needs.

Desires (H2): These traits are not automatically determinants of travel intentions or desires. Existing Tourist Offer (H3): While personality traits shape attraction to tourist offerings, they do not directly influence the overall willingness to travel.

Fourthly, considering the arguments presented, the results obtained in this study cannot be directly compared to the findings reported by Bano et al. (2019) or García and Moral (2022). These previous studies suggest a significant relationship between specific personality traits or behavioral profiles at the psychological level and their impact on consumer motivations. However, despite this disparity, we should not dismiss the results from our study entirely. One valuable framework for understanding how personality traits influence human motivation is the "five-factor model," as highlighted by Ruiz (2003) and Shuai et al. (2023). While our study focused on tourism-related motivations, this model can help evaluate how

personality traits come into play in other contexts beyond tourism. For instance, it can shed light on motivation in education, job search, philanthropic activities, and more.

Fifthly, concerning the initial measurement model, the data indicated that the variables considered in this study are appropriately aligned at the relationship level. Consequently, no adjustments to the indicators were necessary. This finding suggests that each study dimension's criteria (indicators) are relevant and warrant further investigation.

Sixthly, Regarding the proposed new measurement model, which considers the existence of desire as a mediating variable, this study revealed that desire does not mediate between personality traits and tourist needs (H6) or the existing tourist offer (H7). These results stem from the lack of correlation between the following variables:

- Personality Traits (Predictor) and Needs (Mediator): Personality traits do not significantly impact tourists' needs.
- Personality Traits (Predictor) and Existing Tourist Offer (Mediator): Personality traits are not directly related to the existing tourist offerings.
- Personality Traits (Mediator) and Desires (Criterion): While personality traits do not directly affect needs or the tourist offer, desires influence needs and existing tourist offerings.

CONCLUSIONS

First and foremost, this research confirms that motivation significantly influences the purchase decisions related to tourism products or services. It does so through two fundamental factors: Push Factors: These represent the basic needs of human beings. They act as driving forces that prompt individuals to consider travel and explore new destinations. Pull Factors: These are shaped by the existing offerings of a destination, including its infrastructure, cultural richness, and natural beauty. The interplay between these pull factors influences the final choice made by tourists.

Now, turning to the specific personality traits measured in this study—openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism—we find three key insights: trait influence on needs and offer: contrary to expectations, these personality traits do not necessarily impact the needs of Quito tourists or the existing tourist offerings. In other words, an individual's personality traits alone do not determine their travel needs or preferences. Needs and offers influence desires; however, both needs and the existing tourist offer significantly influence tourists' desires. The interplay between these factors shapes what travelers aspire to experience. Desires as mediating variables: Surprisingly, desires do

not act as mediating variables between personality traits and either tourist needs or the existing offer. Instead, desires directly connect to both needs and the available offerings.

To sum up, an individual's personality traits do not automatically dictate their motivation to choose a tourist destination. Therefore, it becomes crucial for destinations to tailor their efforts efficiently. They can showcase the diverse range of tourism products and services available by optimizing resources, time, and budget. These campaigns should be personalized, considering that each tourist has unique desires based on their needs.

Destinations must allocate their efforts toward developing efficient tourism campaigns that optimize resources, time, and finances. These campaigns should showcase the diverse range of tourism products and services available, emphasizing the benefits tourists can derive from them. To achieve this, it is essential to tailor these campaigns to the unique profile of each traveler. Recognizing that every tourist has distinct personality traits and desires, destinations can better satisfy their needs.

In summary, it is essential to note that during the development of this research, no significant limitations were identified that could have adversely affected the study, theoretically and methodologically. However, it is essential to acknowledge a methodological limitation related to identifying personality traits as a valid variable in market research. Specifically, when participants self-identify their personality traits, certain biases may arise. For instance, a notable trend emerged among most participants who reported having an openness to experience trait. This group seeks novel experiences, engages with fantasy, and explores new places. Consequently, this self-identification process may have influenced the study's results. To address this, researchers should explore alternative mechanisms or objective methods for assessing participants' personality traits.

Lastly, for future research related to this topic, we recommend applying the same model in diverse contexts to verify whether the data obtained in this study holds across various human or social realities. By doing so, researchers can expand the scope of assessments and explore the nuances that define each personality trait.

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Determinants of Receptivity Towards Entomophagy among Young Adults

Determinantes de la Receptividad hacia la Entomofagia entre Jóvenes Adultos

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ABSTRACT

This research focuses on understanding the factors influencing the acceptance of entomophagy in Morelia, Michoacán. The study involves a survey aimed at two distinct groups of young adults aged 18 to 29 (control and experimental), a demographic known for being open to evolving food preferences. The results revealed interesting differences in preferences between individuals who have and have not tried insect-based foods. Surprisingly, the price did not emerge as a dominant influencing factor. The study suggests entomophagy can be a viable and accepted dietary option when relevant information is easily accessible, potentially reducing neophobia levels.

Keywords: Entomophagy, sustainable consumption, alternative foods.

JEL code: L66, Q13, Q18, Q56

RESUMEN

El objetivo de este estudio es comprender los determinantes que influyen en la receptividad a la entomofagia en Morelia, Michoacán. La investigación emplea una encuesta dirigida a dos cohortes distintas de adultos jóvenes, de 18 a 29 años, un grupo demográfico conocido por ser receptivo a la evolución de las preferencias alimentarias. Los hallazgos revelaron disparidades notables en las preferencias entre las personas que han probado y no han probado alimentos a base de insectos. Sorprendentemente, el precio no surgió como un factor de influencia dominante. El estudio concluye que la entomofagia puede representar una opción dietética factible y aceptada cuando se dispone de información relevante, lo que podría mitigar los niveles de neofobia.

Palabras clave: Entomofagia, consumo sostenible, alimentos alternativos.

Código JEL: L66, Q13, Q18, Q56.

INTRODUCTION

The global population's growth is intensifying the demand for food, with over 8.1 billion people (WM, 2024; Gahukar, 2011); exploring alternative food production methods is crucial. This is due to increased demand and the ecological harm caused by traditional agriculture, which relies heavily on resources and agrochemicals (Tsoraeva, 2020; Ueasangkomsate et al., 2018; Devi et al., 2024). In addition, challenges such as climate change, energy access, input supply, and food distribution further emphasize the need for urgent action (Badgley et al., 2007; Cronin et al., 2018). Given these circumstances, alternative food production methods are being considered, with entomophagy, the practice of consuming insects, emerging as a sustainable option with low ecological impact and high nutritional value (Carvalho, 2006; Naseem et al., 2021; Derler et al., 2021; Doğan & Çekal, 2022).

Entomophagy refers to consuming insects as a sustainable food source, with over 1,900 insect species suitable for human consumption. Insects play various environmental roles and are a part of human diets. 'entomophagy' comes from 'entomos' (insect) and 'phăgein' (to eat). In India, it is connected to health as' entomotherapy.' Throughout history, edible insects have held significance in many cultures, and the current emphasis on circularity ties this food choice to sustainability rather than traditional farming.

Throughout history, entomophagy, the practice of consuming insects as a food source, has been observed across diverse cultures. China has documented 324 species of insects from 11 orders that are either edible or associated with entomophagy. These include common edible species, less commonly consumed species, and medicinal insects, as identified by Feng et al. (2018). In ancient Greece and Rome, the larva cossus was revered as a delicacy. In South Asia, aquatic bugs, beetles, crickets, grasshoppers, termites, and cicadas, among others, formed part of the local diet as sustenance for the lower social strata in these communities, as highlighted by Fuentes.

Globally, the most consumed insects include locusts, grasshoppers, crickets, ants, termites, butterflies, and beetles. In modern-day Mexico, there are two main types of markets: an informal market with high demand that primarily sells insects as ingredients or snacks and a less developed formal market that mainly sells insects as flour (Ronquillo-de Jesús et al., 2024). Recently, insects have gained popularity as a sustainable protein source, complementing conventional options such as beef and pork due to ease of collection and production. However, the demand for insects remains low, partly due to the historical absence of insects in Western diets. Nevertheless, this trend appears to be shifting, as between 50% and 80% of the population are open to trying and incorporating insects into their diet,

especially once they become aware of the nutritional benefits (Ross et al., 2022a; Freund, 2019).

The practice of insect farming can provide a sustainable method of food production. Edible insects are calorie-dense and highly nutritious, and their consumption could help alleviate famine on a global scale. The protein and micronutrients in insects offer potential environmental and economic benefits (Lange & Nakamura, 2021). Among the benefits of producing and consuming insects, in comparison with agriculture, we could highlight six aspects: 1) lower water consumption; 2) change in land use is not necessary; 3) less pollution (do not require pesticides or agrochemicals); 5) provide more protein per kilogram than meat and vegetables; and, 6) require relatively short spaces for production (Ross et al., 2022a; 2022b).

In recent years, the per capita water availability in the Cuitzeo basin has experienced a reduction of 10%, leading to an increase in water scarcity in urban and agricultural centers (Alfaro, 2023; Camacho, 2022). Simultaneously, the population has consistently risen over the last two decades. Furthermore, there is a recurring concern regarding grasshopper infestations affecting rural crops in Morelia, triggering discussions on the potential collection and utilization of these insects as a food source. This initiative presents a sustainable and economically feasible solution with minimal water consumption (Cerritos, 2019), introducing the concept of entomophagy as a viable approach to generating nutritious sustenance. The ongoing research is structured around a demand-oriented perspective to investigate the acceptance of entomophagy as a substitute food supply. What factors influence Morelia's consumption of edible insects?

EDIBLE INSECTS' PRODUCTION AND ENTOMOPHAGY TO SUSTAINABILITY. THEORETICAL ASPECTS

The insects can be cultivated using a variety of organic substrates, ranging from livestock manure to food and crop residues. This practice adds value to agricultural waste, decreases pollution caused by waste disposal, and minimizes soil, air, and water contamination risks. Additionally, insects produce lower levels of greenhouse gases, exhibit efficient feed conversion rates, and have lower water requirements than conventional farm animals. Moreover, they present minimal risk of zoonotic disease transmission (Borsari, 2022). The increasing demand for food requires rapid, sustainable production (Acosta, 2024). Introduce novel food alternatives, enhance efficiency, and adopt eco-friendly methods. Entomophagy transforms feed efficiently, contrasting with cattle, improving food security (Naseem et al., 2020; Varela, 2019).

Insects are a sustainable food source globally. Challenges, determinants, and benefits: Because of their cold-blooded nature, insects require less water than cattle, making them highly efficient at converting food to protein. Using insect-based food reduces water usage, preserving water for agricultural needs. Agriculture faces challenges like public undervaluation of water, changes in river flow, and overuse of aquifers; instead, insect production requires less water and emits less ammonia (Borsari, 2022; Morán, 2021).

In soil conservation, cultivating edible insects has a beneficial influence on soil restoration. The expansion of agriculture and cattle breeding has notably contributed to widespread deforestation, with cattle breeding necessitating more extensive tracts of land for grazing. Conversely, insect cultivation exhibits a reduced reliance on land resources in contrast to livestock rearing. Through a juxtaposition of entomophagy and livestock husbandry in terms of land utilization, it becomes apparent that entomophagy serves as an eco-friendly method of food production (Lange & Nakamura, 2021; Cruz & Peniche, 2018).

While insects may not be readily available in all climates or seasons, they can be substituted with alternative protein sources based on seasonal availability. For example, the consumption of seasonal fruits tends to increase during periods of abundant production, paralleling the trend of insect consumption. In some countries like Holland and the Netherlands, supermarkets have introduced burgers and nuggets made from worm meal, and insects are being cultivated for pet and fish feed purposes. Insects can serve as a protein substitute alongside lentils and algae. Furthermore, consuming insects provides a dietary option with minimal greenhouse gas emissions (Cruz & Peniche, 2018).

Entomophagy, the practice of eating insects, is uncommon in the Western world, primarily due to the challenges of collecting insects in temperate climates compared to tropical regions. Western societies generally dislike insects (Van Huis, 2015). Nevertheless, owing to their ecological and nutritional benefits, there has been a growing interest in cultivating and consuming insects. Consequently, this dietary choice is anticipated to gain a larger market share, as evidenced by the increasing demand in recent years (Dagevos, 2021; Sogari, 2019). Although there is a lack of awareness regarding the nutritional value of insects and insufficient training in rearing practices, large-scale insect rearing as an alternative in rural areas has yet to be widely implemented. There is potential for insects to serve as a significant protein source based on available information (Talom et al., 2024).

Insects are growing in food production, producing products like cookies, flour, and protein bars. Banu and Kudesia (2023) discuss a market analysis of edible insect foods. Global meat consumption in 1970 was 26 kilograms per person, projected to reach 41 kilograms. Meat consumption may triple by 2050, raising environmental concerns. Transitioning to insect-

based diets could alleviate resource strains. Edible insects are resource-efficient and offer a beef-equivalent protein profile with essential minerals (Van Huis, 2020).

Insect farming would also prioritize the conservation of overexploited species that possess economic value and are in high demand. Nonetheless, several studies have indicated that the primary factors influencing the acceptance of edible insects include knowledge, aversion, cultural influences, and culinary choices. Numerous individuals consume edible insects as a sustainable dietary choice to mitigate environmental imbalances and address the challenges of global warming.

METHODOLOGY

The methodological design to achieve the objective comprises seven main steps. First, studies are reviewed to identify the techniques and variables used. Second, experts were interviewed to identify relevant variables, and the Saaty algorithm was used. Third, variables and their indicators are selected for quantification. Fourth, the interview was designed and applied in a pilot test. Fifth, the sample is delimited, and 387 questionnaires were used. Sixth, interviews are conducted. Lastly, an experimental design is developed.

Figure 1. Relative frequency of occurrence of variables in entomophagy studies

Source: Own elaboration (Aung et al., 2023; Cicatiello et al., 2020; Francis et al., 2019; Marinova & Bogueva, 2022; Megido et al., 2016; Caparros et al., 2014; Chantawannakul, 2020; Hartmann et al., 2017; Bialkoba et al., 2016; La Barbera et al., 2020; Mancini et al., 2019; Marinova et al., 2019; Mancini et al., 2019; Nyberg et al., 2021; Ros et al., 2022a; Hartmann & Siegrist, 2017; Sogari et al., 2019; Lensvelt & Steenbekkers, 2014; Van Huis et al., 2015; Verneau et al., 2016, 2021.

The review of previous studies analyzed 50 scientific articles on entomophagy published between 2017 and 2023. The objective was to identify the variables most relevant to insects' demand, purchase, and consumption. These variables were constructed inside a circle, and indicators can be seen outside the circle (Figure 1).

The variables were categorized based on their attributes, as illustrated in Table 1. Different nomenclatures in diverse research publications may pertain to these variables, though they signify identical factors. This categorization elucidates five key variables: CA denoting Quality, CU representing Culture, NU indicating Nutrition, Pre for Price, and NE for Neophobia (commonly termed Disgust in alternative investigations) (Figure 2).

Figure 2. Grouping of variables and indicators.

Source: Own elaboration.

A comparative analysis of different groups and identifying factors influencing the decision to consume insects to ascertain the impact of Neophobia, Nutrition, Culture, Price, and

Quality on adopting entomophagy delineated two distinct cohorts: individuals who have experienced insect consumption and those who have not. The latter cohort was assessed regarding their inclination to engage in entomophagy, gauged by the variables mentioned. The research encompassed interviews with college students aged between 18 and 30, conducted from January to March 2023.

The interview comprised 31 iítems. The Likert scale uses a 1 to 5 range per indicator, and integrating these indicators quantifies the variable. A trial examination was conducted with 10 participants to evaluate its effectiveness, yielding a Cronbach's alpha of 0.72. This prompted the refinement of inquiries to enhance precision. After integrating the revised questionnaire, Cronbach's alpha consistently surpassed 0.90. The survey encompassed 387 young adults aged between 18 and 30. Among them, 202 had no prior exposure to the consumption of insects, while 185 did. The survey was disseminated to undergraduate students spanning diverse fields such as Architecture, Biology, Accounting, Economics, Philosophy, and Civil Engineering.

The study conducted on young adults aged between 18 and 30 is well-justified. This is because young adults have established eating habits that can be modified during this period. University students assume responsibility for their diet for the first time, making it an ideal time to introduce dietary changes. During this period, social, psychological, and cultural factors combine to form a new eating pattern that may last for the rest of their lives (Cervera et al., 2013).

EXPLORING THE ACCEPTANCE OF ENTOMOPHAGY: RESULTS AND DISCUSSION

Initially, a statistical F-test analysis was conducted for the ratio interval of variances between individuals inclined to consume insects or their by-products and those opposed to consumption. The findings indicate that the variance ratio is 1. The data exhibits satisfactory variance behavior, allowing for a comparison of means, as demonstrated in Table 1. This suggests that a normality test analysis should be pursued.

Table 1
Results of Fisher's F-Test for Variance Ratio at a 95% Confidence Level

Ratio	1.271
F (Observed Value)	**1.271**
F (Critical Value)	**1.329**
GL1	**201**
GL2	**184**
valor-p (bilateral)	**0.098**

alfa	**0.05**

Source: Own elaboration with the information of the sample.

Following this, normality assessments were carried out to examine the data distribution. The data presented in Table 2 indicates the probability that all variables follow a normal distribution. Once this fundamental requirement is established, we can analyze the variables within both groups: the group that favors insect consumption and the group that does not, in addition to the experimental group, to identify any significant differences.

Table 2. Shapiro-Wilk Normality Test

	Quality	**Price**	**Culture**	**Nutrición**	**Neophobia**	**Total**
W	0.985	0.969	0.981	0.962	0.984	0.978
p-value (bilateral)	**0.042**	0.000	0.012	0.000	0.029	**0.005**
alfa	0.05	0.05	0.05	0.05	0.05	0.05

Source: Own elaboration with the information of the sample.

Table 3. Analysis of Means for Acceptance of Entomophagy Between Groups

	Quality	**Price**	**Culture**	**Nutrición**	**Neophobia**	**Total***
Difference	-0.376	-0.050	-0.816	-0.646	-0.580	2.459
z (Observed value)	-6.659	-0.752	-15.460	-10.862	-9.357	10.229
|z| (Critical value)	1.960	1.960	1.960	1.960	1.960	1.960
p-value (bilateral)	**<0.0001**	**0.452**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
alfa	0.05	0.050	0.050	0.050	0.050	0.05
*** = integration of all variables; the integration of the entomophagy acceptance rate**						

Source: Own elaboration.

The research has indicated a conspicuous disparity between the experimental group (Table 3), subjected to testing, and the control group, which did not undergo testing, regarding the embrace of entomophagy. Specifically, a substantial contrast is observable across four of the five variables: quality, cultural aspects, nutritional value, and neophobia. These variables notably influence the acceptance of entomophagy among the study participants. Further studies (Sogari, 2019; Verneau, 2016) suggest that factors such as neophobia, encompassing aspects of unfamiliarity, aversion, appearance, and societal norms, exert a more significant impact on individuals' readiness to explore insect consumption than financial considerations.

In addition to the acquired findings, a principal component analysis revealed that 80% of the variance is concentrated in two factors. Factor 1 (F1) demonstrates the lowest factor load in the price variable. In contrast, the second factor (F2) shows the highest factor load in this variable, implying that F2 is mainly influenced by price, accounting for 15.4% of the variance. This confirms that the price variable does not act like the other variables and does not hold significant importance in consumers' decision-making regarding insects.

Consequently, all variables, excluding price, exhibit noteworthy influence concerning eigenvalue, owner vectors, and factors loading for F1, as indicated by their correlation with F1 (Table 4).

Table 4. Principal Component Analysis to Entomophagy Variables

	F1	F2	F3	F4	F5
Eigenvalue	3.214	0.767	0.430	0.319	0.270
Variability (%)	64.276	15.339	8.604	6.372	5.408
Cumulative %	64.276	79.615	88.219	94.592	100.000
Own vectors:	F1	F2	F3	F4	F5
Neophobia	0.491	-0.168	-0.090	-0.297	-0.796
Nutrición	0.441	-0.350	0.755	0.302	0.148
Culture	0.481	-0.206	-0.265	-0.564	0.581
Precio	0.330	0.894	0.269	-0.135	0.035
Quality	0.473	0.087	-0.529	0.696	0.074
Factor loads:	F1	F2	F3	F4	F5
Neophobia	0.881	-0.147	-0.059	-0.168	-0.414
Nutrición	0.791	-0.307	0.495	0.170	0.077
Culture	0.863	-0.180	-0.174	-0.318	0.302
Precio	0.591	0.783	0.177	-0.076	0.018
Quality	0.847	0.076	-0.347	0.393	0.038
Correlations between variables and factors:					
	F1	F2	F3	F4	F5
Neophobia	0.881	-0.147	-0.059	-0.168	-0.414
Nutrición	0.791	-0.307	0.495	0.170	0.077
Culture	0.863	-0.180	-0.174	-0.318	0.302
Precio	0.591	0.783	0.177	-0.076	0.018
Quality	0.847	0.076	-0.347	0.393	0.038

Source: Own elaboration.

In a study conducted in Myanmar, it was discovered that 67% of the population exhibited a preference for consuming insects. This preference was influenced by ethnicity, religion, attitude toward eating insects, aversion to insects, nutritional value, societal factors, and disgust. The practice of entomophagy is prevalent among all ethnic groups, including both urban and rural residents, and there is a moderate level of acceptance of edible insects as a food source. However, despite this prevalence, edible insects are not commonly consumed, and there are persistent challenges in leveraging them to address food insecurity and malnutrition (Aung et al., 2023).

In a recent research study, 88 participants sampled edible insects while researchers investigated various factors such as neophobia, gustatory expectations, and past consumption

history of the food. The results indicated more openness among male participants towards exploring edible insects than their female counterparts (Sogari, 2019).

Additionally, the study found a negative correlation between food neophobia and the willingness to consume insects. Individuals exposed to insects for the first time showed an improved perception of their sensory qualities. The study suggests that awareness campaigns could help increase understanding of the benefits of consuming insects, mainly due to their novelty and limited familiarity. These findings are consistent with our research results, although our analysis did not include sensory parameters.

Numerous research studies have indicated no direct correlation between the perceived importance of sustainable consumption and the willingness to buy insect-based products among survey participants. However, a decrease in aversion to consuming insects among participants is positively correlated with a greater desire to purchase insect-based items. Additionally, a reduced aversion to insect consumption among participants is linked to a stronger intention to buy such products, with cultural factors playing a significant role in this association (Dagevos & Taufik, 2022).

In traditional societies, introducing a new food item is often resisted due to social and psychological factors. A neophobia scale, ranging from one to ten, has been developed to quantify this resistance. Neophobia significantly impacts the decision-making process regarding the consumption of edible insects. A 2016 study at the University of Parma in Italy focused on individuals aged 18 to 40. The findings revealed that cultures that include insects in their diets perceive them as a valuable source of nutrients. However, in Western societies, edible insects are frequently considered repugnant due to psychological factors. Nonetheless, there is a promising outlook for the practice of entomophagy (the consumption of insects) as consumer interest and curiosity propel the experimentation with edible insect products, as suggested by studies conducted by Sogari (2019).

The recent study underscores that there are still numerous unknown factors related to nutrients, marketing, promotion, and information concerning the production and consumption of insects at the local level. *Valle y Pampa*, a Peruvian company, experimented with introducing an entomophagous product to reduce the carbon footprint of animal production. Nevertheless, the findings indicate that producing a product made from edible insects necessitates further research and expertise to comprehend the properties and benefits of edible insects in Peru. In contrast to Peru, optimal conditions for producing edible insects were discovered in San Lorenzo. This discovery can contribute to a more sustainable pest management system by considering insect-mediated ecosystem services, such as biological control (Cruces et al., 2020).

The available research highlights the potential advantages of introducing insect-based food products. However, further in-depth research and practical demonstrations are essential to grasp their potential fully. This study is a source of inspiration for future research to address the current limitations in insect-based product production. Promoting the consumption and acceptance of entomophagy requires ongoing effort and attention. It is worth noting that significant work is still needed to encourage the consumption and acceptance of insect-based foods (Hartmann, 2017).

The available research highlights the potential advantages of introducing insect-based food products. However, further in-depth research and practical demonstrations are essential to grasp their potential fully. This study is a source of inspiration for future research to address the current limitations in insect-based product production. Promoting the consumption and acceptance of entomophagy requires ongoing effort and attention. It is worth noting that significant work is still needed to encourage the consumption and acceptance of insect-based foods (Hartmann, 2017).

Researchers in Myanmar conducted a recent study that revealed the various factors influencing edible insect consumption. These factors include ethnicity, religion, attitudes toward eating insects, insect phobia, nutritional properties, social concerns, discomfort, income, family size, taste, smell, and safety concerns. The study emphasizes the importance of cultural context as a significant variable with diverse expressions and points of reference (Aung et al., 2023).

CONCLUSIONS

The consumption of insects, known as entomophagy, is not widely embraced in Western societies. Consequently, the tradition of cultivating insects as a food source has yet to become integrated into Western eating habits. In contrast, pre-Columbian cultures and rural societies favor consuming insects more.

Various factors influence insect consumption, including quality, price, neophobia, nutrition, and culture. Numerous research studies have analyzed and categorized these factors using different indicators. This study focuses on the Universidad Michoacana de San Nicolás de Hidalgo student community, specifically individuals aged 18 and 30. This age group is crucial in developing eating habits and forming critical nutrition and food preference decisions.

In certain studies on entomophagy, the price factor is omitted or regarded as a secondary factor with less impact on the decision to consume insects. In this study, we aimed to verify this information, and the outcome indicated that price was not a significant variable between

the control and experimental groups. Results showed acceptance of entomophagy, indicating the feasibility of adopting edible insects in the diet.

There appears to be a significant difference between the groups regarding their willingness to consume insects. The results suggest that those who had the chance to taste the insects, regardless of whether they accepted or declined, and those who did not have the opportunity to taste did not consider price to be a deciding factor in their decision to consume insects. However, factors such as neophobia, culture, quality, and nutrition did play a significant role in their decision-making process. The results suggest that it is feasible to consider entomophagy as an alternative food source; simultaneously, its production has minimal environmental impacts.

Implementing information campaigns promoting the nutritional benefits of consuming insects could influence the consumption decisions of individuals between the ages of 18 and 30. This is because the lack of knowledge and fear of trying new foods are significant factors in the decision to engage in entomophagy. Therefore, producing insects for human consumption could be a viable solution to reduce water, ecological, and carbon footprints. However, it is crucial to study the associated costs.

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Knowledge Management and Human Resource Management to Innovate: An Empirical Analysis in the Textile Industry

Gestión del conocimiento y gestión del recurso humano para innovar: Un análisis empírico en la industria textil

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ABSTRACT

This research aims to understand the impact of knowledge management and human resource management on innovation in textile industry companies in central-western Mexico. This is a qualitative, descriptive, correlational study with a non-experimental, cross-sectional design. The sample is simply random and is made up of 386 companies in the textile industry. A structured questionnaire was applied using a Likert-type scale with five ranges. The information analysis used the Structural Equation Model (SEMPLS). In the results, the analysis of the statistical parameters t – t-student and p-value confirm the statistical significance of the Path coefficients with 95% confidence. The results of the research coincide with some of the literature. This research fills a gap in the literature on the phenomenon studied.

Keywords: Innovation, Knowledge Management, Human Resource Management, Textile Industry.

JEL code: L6.

RESUMEN

El objetivo de esta investigación es, conocer el impacto de la gestión del conocimiento y la gestión del recurso humano en la innovación de las empresas de la industria textil de la zona centro occidente de México. Es un estudio cualitativo, descriptivo y correlacional, de diseño no experimental y corte transversal. La muestra es aleatorio simple y está conformada por 386 empresas de la industria textil. Se aplicó un cuestionario estructurado, con escala tipo Likert, con cinco rangos. El análisis de la información se utilizó el Modelo de Ecuaciones Estructurales (SEMPLS). En los resultados, el análisis de los parámetros estadísticos t–student y p-value confirman la significancia estadística de los coeficientes Path con un 95% de confianza. Los resultados de la investigación coinciden con alguna de la literatura. Esta investigación llena un vacío en la literatura, sobre el fenómeno estudiado.

Palabras clave: Innovación, Gestión del conocimiento, Gestión del recurso humano, Industria Textil.

Código JEL: L6

INTRODUCTION

The role of knowledge management, human resources management, and innovative performance within textile firms enhance the organization's performance. The textile industry has become a critical component of the global economy and daily life. Consequently, an assessment of input utilization that considers innovation, technology, and efficacy is imperative (Haider & Anees, 2024).

The textile industry employs tens of millions of people worldwide and is one of the global industries that provides basic daily human needs. In 2021, the global textile industry generated more than 1.04 trillion dollars (Harsanto et al., 2023). For example, the textile and clothing sector is essential in the European manufacturing industry, generating a turnover of 166 billion € and employing 1.7 million people (Idiano D'Adamo et al., 2024). Now then, globalization provides access to practically all textiles traded worldwide.

While beneficial for consumers, globalization poses challenges for the textile manufacturing industry. It is essential to mention that the textile industry was undoubtedly one of the first sectors to be affected by the effects of globalization. Today, the textile industry's great and main strength is and will be its capacity for resilience and recovery. However, more is needed to innovate and evolve for the future because success is limited in time (De Jesus, 2024).

Following the above, Rui Dantas (2024) highlights a significant uptrend in research on the technological integration of Industry 4.0 within the textile sector. Key focus areas include automation, IoT, and intelligent manufacturing, reflecting a paradigm shift towards more adaptive, predictive, and self-optimized production processes. The analysis also reveals a geographical concentration of research activity, particularly in Asia and Europe, with China and the UK leading in output and international collaboration, respectively (Dantas, 2024).

The textile industry is one of the most polluting sectors. Therefore, in addition to the impact of global competition demanding continuous innovation, adopting a sustainability strategy is necessary to reduce its adverse environmental effects. Competitiveness in the textile industry hinges on sustainable innovation (Martins, 2024).

Analyzing efficiency in the textile and clothing industries aims to generate knowledge that can strengthen theoretical understanding and practical results in industrial economics and business management. Research into the issue involves analyzing the multifaceted factors involved in efficiency, such as technological innovation, levels of investment in research and development (R&D), the types of production methods adopted, and market dynamics (De Moraes e Soares et al., 2024).

Innovation is essential in companies of all sizes and all regions. This research studied companies in the textile industry in Mexico's central-western area. In this territory, micro, small, and medium-sized companies predominate (90.98% micro, 7.28% small, 1.41% medium, and 0.30% significant) (INEGI, 2022), which, due to their size and the evolutionary and interactive nature of the innovation process, are characterized by carrying out, involves mainly gradual innovations based on the knowledge previously available in the company. Organizations also introduce radical innovations, but to a lesser extent, due to the high economic effort required for their development. For this reason, this type of innovation has acquired a secondary role in the study area.

It is well recognized that technological innovation plays a crucial role in the development of the textile industry system. As the innovation process evolves, the extent of technological dissemination and the competitive balance within the textile industry also shift, resulting in fluctuations in the industry's economic growth. These fluctuations, driven by innovation, are complex, irregular, and only partially cyclical.

Likewise, recent studies have highlighted the increasingly significant relationship between innovation in the textile industry and sustainability. Chourasiya and others (2024) emphasize a lag in technology adoption, particularly in developing countries, despite advances in sustainable practices to reduce environmental impacts (Chourasiya et al., 2024). Dominidiato and others (2024) explore how innovation fosters interdependent supplier-customer relationships, focusing on product durability and recyclability, which are crucial to achieving sustainability goals.

Harsanto and others (2023) provide a systematic review indicating an increasing focus on green innovations, such as eco-design and cleaner production, driven by consumer demand and regulatory pressures. Consequently, the textile industry should implement initiatives to reduce the perceived gap between fashion and sustainability as an innovative action. Such initiatives could include using recycled materials, reducing CO2 emissions, and conserving water or energy (Grazzini et al., 2021). In addition, companies must pay close attention to consumer demands (Pencarelli et al., 2020).

In this new scenario, traditional manufacturing sectors, such as the textile industry, face changing times. Textile companies must transition from machine-dominated manufacturing to digital manufacturing. This sector relies on product customization and short manufacturing cycles. However, the textile industry mainly comprises small and medium-sized enterprises (SMEs) with limited capacity to invest and adopt new production technologies. The new paradigm includes productive modular structures composed of devices in the Internet of

Things environment. Robotic tasks can be used in the autonomous or collaborative assembly of clothing sets and the unfolding of garment pieces.

SMEs in the textile sector can benefit from technological innovations in cloud computing for intelligent clothing, fabric customization, production line control, mass customization, store programming, efficiency improvement, and environmental pollution reduction. This production approach requires new business models, increased management capabilities, and updated physical infrastructure. Preface information technologies in companies enable the management of distributed resources (employees and equipment) to interact remotely with each other (Martins, 2024).

After the above, this study aims to comprehensively investigate the role of knowledge management and human resource management as crucial drivers of innovation in textile companies in the central-western region of Mexico. The study seeks to examine the academic perspective, identify trends, and unravel patterns related to knowledge management and human resource management and their relationship with innovation in the textile industry.

This article contributes to the study of innovation in textile companies in three ways. First, the specific impact of knowledge and human resources management on innovation was theoretically developed and verified through empirical research. Second, it was found that it is necessary to acquire knowledge, but it is not only about acquiring it; the actual value of knowledge is obtained through its correct management to use it in activities that lead to some innovation. Third, the study reveals that the human part of the company also turned out to be a significant variable for innovation because the human being is the one who possesses the skills and capacities to make innovation possible; he is the source of creativity. In that sense, one can only speak of business innovation with proper human resource management.

The work is divided as follows. Section 2 proposes a review of the literature on the relationship between knowledge management and human resources management with innovation. Section 3 includes the methodology of this work, based on the analysis of information with the Smart-PLS software. Section 4 proposes the results obtained from the measurement with the software above. Section 5 presents the discussions and implications of this work. Section 6 includes the conclusions drawn from this work.

THEORETICAL FRAMEWORK

Innovation

This study focuses on the relationship between Knowledge Management and Human Resources Management as a strategic source of innovation in the textile industry in the central-western area of Mexico. Innovation has been a central theme in research. Therefore, the literature analysis reveals a clear upward trend in academic interest in innovation within the textile industry, with a notable increase in publications (Mata, 2024). Various perspectives have emerged when addressing the issue of Innovation within the realm of business activities. Among these perspectives, industrial economics offers insights into different industries based on their approach to Innovation (Dominidiato, 2024).

According to Vlasova and others (2024), critical external factors for Innovation are mentioned. While remaining beyond the control of company management, these factors significantly affect management decisions regarding implementing innovations. A productive environment for innovation is defined by geography (company location), market parameters, knowledge dissemination and exchange mechanisms (human resources, availability of financial resources, and infrastructure), specific features of government regulations, and the public sphere (Vlasova et al., 2024).

However, the need for constant renewal with new capabilities and valuable assets in an increasingly complex context represents an extraordinary challenge for companies. Finding new business models in today's increasingly complex context requires balancing multiple factors with multidirectional influences and higher-level competencies. One of the latest strategies is intrapreneurship, internal entrepreneurship in which innovations are generated and the company is constantly updated. Intrapreneurship is a type of entrepreneurship in which employees create new enterprises and are part of the parent company. Intrapreneurship is one of the critical mechanisms for generating the innovations that companies need to achieve sustainability in dynamic markets (Vivek & Chandrasekhar, 2024).

In this exact order of ideas, it makes sense to look at how innovation at the forefront is changing the face of the textile sector in the world today. The textile industry is embracing digitalization, advances in materials science, and advanced manufacturing technologies to produce clothing using sustainable and ethical methods efficiently. New technologies are modernizing traditional textile production, giving new impetus to developing related sectors and expanding its potential to increase its contribution to the national GDP. With the advent of new technologies, the variety of fabrics, materials, and textiles and their application areas are expanding.

The concept of sustainable textile production is being introduced, which involves minimal energy use in production and the possibility of recycling products at the end of their life cycle. There is a trend towards increasing the availability of environmentally friendly textiles and economic efficiency. Examples of eco-friendly technologies include fabrics made from bamboo and recycled waste. The technology of creating customized textiles is gaining momentum, allowing the customer to remotely select or develop various designs and print them on fabric. Smart computerized looms quickly create complex patterns, and laser scanners and computers create finished patterns without cutting the fabric (Meetei et al., 2024).

In summary, we expect a Textil Industry, internal resources, innovative capabilities, market environment, and external sources of knowledge to be important determinants of its decision to engage in innovation and translate these innovations into process outcomes (Wadho & Chaudhry, 2024).

KNOWLEDGE MANAGEMENT

Knowledge management can be seen as a science or practice of what is being implemented by policymakers in the industry (Ermini et al., 2024). The central object of knowledge management is knowledge, which is divided into implicit and explicit. Both are intellectual assets that collaborate to become human capital for the company or organization. In the textile industry (Baloyi et al., 2024), KM can be carried out by individuals, groups, or the organization itself and beyond (Petrillo et al., 2024). Implicitly, all models of knowledge management are to explain who the executor is. Explicitly, the player appears in KM-Nonaka. Knowledge management is implemented through a mechanism for continually obtaining or generating knowledge.

In the Nonaka model, for example, knowledge management consists of socialization, externalization, combination, and internalization. The knowledge management process is the company's ability and is believed to be a precondition of practical implementation (Salina, 2012). In the context of the textile industry (Kitaw et al., 2024), knowledge acquisition derived from a marketing manager who obtains information from the buyer is studied, creating opportunities for the company (Nigatu et al., 2024). The customer is a business partner and is considered to have a more comprehensive knowledge of market demand in the country and abroad.

Moreover, according to the knowledge spillover, the acquisition is also due to exchanging knowledge with business partners. To produce targeted innovation performance, the

company must manage knowledge appropriately acquired. Enterprises that manage knowledge effectively can be more innovative (Fibres & Textiles in Eastern Europe, 2020)

The role of knowledge management capabilities and innovative performance within textile firms enhance the organization's performance. The textile industry has become a critical component of the global economy and daily life. Consequently, an assessment of input utilization that considers innovation, technology, and efficacy is imperative. Because knowledge can no longer be obtained solely within organizational networks or national borders (Jegede & Muchie, 2024), undoubtedly, it is through internal cooperation that organizations gain access to a wide range of implicit and explicit knowledge within the organization. By strengthening internal engagement with the workforce, organizations gain knowledge of what, where, and to what extent information is stored within the organization.

Some researchers believe that (Attarpour et al., 2024) the potential to stimulate innovation within an organization exists through internal collaboration. There is a positive correlation between increased information sharing among employees and their increased capacity for innovation. Similarly, as a strategic form of enterprise R&D (Research and Development) activities, R&D models can be divided into internal R&D and cooperative R&D, depending on organizational boundaries and knowledge sources. Many studies have highlighted the importance of external knowledge sources for enterprise innovation and considered that cooperative R&D can effectively promote innovation performance (Zhang et al., 2020).

Likewise, previous studies have shown that KM enables firms to use current knowledge and expertise to develop incremental innovation and improve knowledge exploitation. Knowledge acquired from outside the firm significantly assists employees' creative behavior. Emerging consumer and business knowledge further develops employees' experiences, broadens their thinking, and advances innovative actions. Firms can encourage knowledge acquisition from external collaborators to promote RI initiatives, generate radical ideas, and create a creative environment that fosters performance and growth (Nabi et al., 2023).

Knowledge is the foundation that innovation needs. This can occur in all industries and companies, regardless of technological level (Piana & Brustolin, 2023). The stock of cutting-edge knowledge is essential in technology-intensive sectors and the learning of enterprises and organizations. Explicit knowledge can be expressed through words, data, documents, and other readable forms and transferred by common knowledge carriers, which are easy to understand and absorb. Tacit knowledge mainly refers to knowledge that exists in thought and is difficult to formalize.

Most of it is internalized as resources of organizations or individuals, which can be transferred and shared through language and communication, value influence, conferences,

etc. It is necessary to emphasize that since innovation occurs in the field of knowledge, it helps improve the enterprise's performance. Therefore, knowledge transfer between enterprises refers to the transfer of knowledge from the knowledge owner to the knowledge recipient (Wang et al., 2024). Hence, collaborative efforts among stakeholders are needed to facilitate knowledge sharing, technology transfer, and capacity building to accelerate innovation in textile organizations (Chourasiya et al., 2024).

HUMAN RESOURCES MANAGEMENT

Human resource management (HRM) focuses on job design, improving employee problem-solving skills, reducing individualism, and increasing cooperation among members to develop innovative ideas that help teams complete tasks more efficiently. In addition, HRM allows enterprises to accurately train and evaluate the employee performance of well-qualified employees, enabling them to come up with innovative ideas and creatively apply these ideas to teamwork to increase innovation outcomes for the entire enterprise.

In addition, by participating in the decision-making process through open and honest discussions, HRM also helps strengthen the relationship between employees and managers. This allows employees' new ideas to be readily accepted and implemented by managers at work, thereby improving the innovation capacity of enterprises. When the relationship between employees and managers becomes cohesive, employees will have a sense of security and positive attitudes toward innovative behavior by forming and implementing new ideas at work. Therefore, enterprises with solid human resource management will create a foundation to promote innovative and creative ideas among employees (Nguyen & Dao, 2023). Human resource management's primary objective is to provide opportunities for superior work behavior to achieve sustainable competitive advantage, including innovative performance (Setyaningrum & Wulandari, 2024).

Managing human resources is more complicated than managing capital or technology. A flourishing human resource management (HRM) system is necessary for any business organization to manage its human resources effectively. Robust and creative HRM practices should support the business organization's HRM system. Business activities used to manage a group of human resources and ensure that those resources contribute to attaining organizational goals are alluded to as HRM practices. Signify the business practices directed at controlling the group of human resources and confirming that the resources are working towards achieving business objectives. Solid and innovative HRM practices should support the HRM system of the business organization. The fundamental aim of this paper is to examine the contribution of innovative HRM practices, including employee participation, performance appraisal, compensation, selection, training, and redeployment–retraining on

firm performance (Aslam et al., 2023). In the relationship between HRM, innovation, and performance, HRM enhances innovation, while innovation positively contributes to business performance (Turulja et al., 2023).

METHODOLOGY

This research uses a qualitative study methodology, which is descriptive and correlational in scope, non-experimental, and cross-sectional in design. This methodology involves collecting and evaluating data to identify correlations, patterns, and trends between variables. In this case, we obtained quantifiable information on the relationships between innovation and the independent variables of Knowledge Management and Human Resources Management. The target population, Universe, was obtained considering a total population (N) of 29,712 companies, a confidence level of 95%, and a probability in favor of 0.5, the sample of 386 companies.

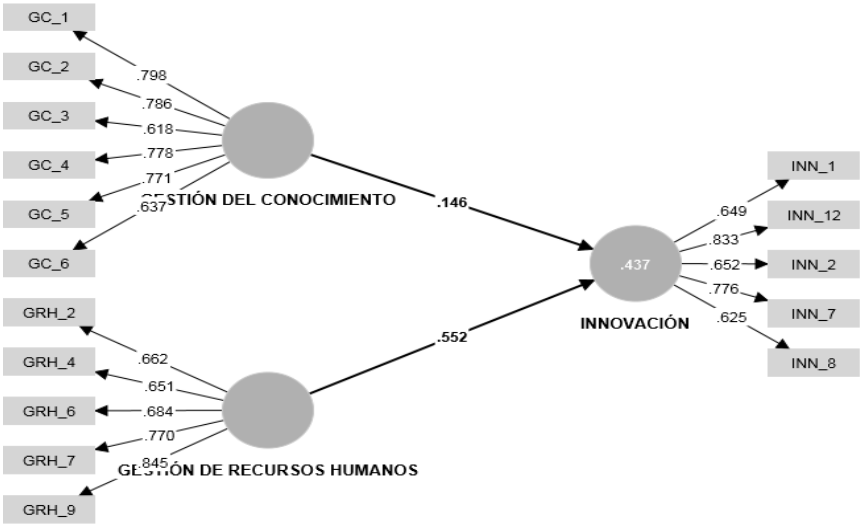
The instrument used for data collection was a structured questionnaire with closed questions, coded with a Likert scale, which was designed by dividing each question into five possible response alternatives: agree (5), agree (4), neither agree nor disagree (3), disagree (2), totally disagree (1), to which a score of 1 to 5 was assigned for better tabulation of the responses.

To explore complex interactions between observable and latent variables in a data set, the current research employs structural equation modeling using partial least squares (PLS-SEM), a statistical approach that combines factor analysis and regression. The construction of a measurement model, the evaluation of its validity and consistency, and the construction of a path model to analyze the association between unobserved variables are part of the study. PLS-SEM is resistant to non-normal data distributions and can handle a variety of sample sizes, making it ideal for exploratory research and theory building. In addition, it allows for the inclusion of formative and reflective measurement methods.

RESULTS

Figure 1 shows the designed SEM-PLS model. The Knowledge Management (KM) and Human Resources Management (HRM) variables are exogenous constructs that play the role of predictor variables, and the Innovation (INN) variable represents the predicted endogenous construct. In this case, the items are reflective indicators because they are expressed in terms of the construct; in other words, they are manifestations of the unobserved variable.

Figure 1. SEM PLS Innovation



Source: Own elaboration.

The first point is the analysis of the reliability of internal consistency in evaluating the measurement model. The value of Cronbach's alpha coefficient, the composite reliability measure, and the Average Variance Extracted (AVE) are studied. The accepted value for both Cronbach's alpha and composite reliability is 0.7 for a modest level of reliability in the early stages of research and 0.9 for basic research (Nunnally, 1978; Fornell & Larcker, 1981). On the other hand, the AVE is a measure that provides the amount of variance a construct obtains from its indicators concerning the amount of variance due to measurement error. The AVE values must be equal to or greater than 0.50, thus ensuring that the construct explains at least half (50%) of the variance of the indicators.

Table 1 shows the results of Cronbach's Alpha, composite reliability, and AVE estimation. As can be seen, the Cronbach's Alpha coefficient and the composite reliability measure are higher than 0.70 in each of the three constructs studied, demonstrating the variables' validity and internal consistency.

The Human Resources Management, Knowledge Management, and Innovation constructs present Cronbach's Alpha of 0.773, 0.830, and 0.756, respectively, all acceptable values for the model. In the case of Composite Reliability, values 0.847, 0.875, and 0.835 were obtained for the constructs Human Resources Management, Knowledge Management, and Innovation, respectively, which are also acceptable in the model. According to the results in Table 1, the three constructs show an AVE higher than the minimum required of 0.5.

Table 1. Results of internal consistency analysis

Variable	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
GRH	.773	.847	.527
GC	.830	.875	.541
INN	.756	.835	.506

Source: Own elaboration.

The heterotrait–monotrait (HTMT) measure is used to estimate correlations between constructs; the maximum acceptable value of the HTMT measure is 0.85. The results of the HTMT measure for the analyzed model are presented in Table 2. As can be seen, the value of the relationship between the variables is lower than the maximum limit of 0.85; in this sense, it is confirmed that the indicators that make up each variable meet the discriminant validity criteria according to this test.

Table 2. Measurement results HTMT

Variable	GRH	GC	INN
GRH			
GC	.819		
INN	.819	.609	

Source: Own elaboration.

Once the measurement model has been evaluated, the structural model must be evaluated, where the predictive capabilities and the relationships between the model constructs are analyzed (Chin, 2010). The first step is to evaluate the collinearity of the model with the Variance Inflation Factor (VIF). According to Hair, Hult, Ringle, and Sarsted (2017), it is considered that there are signs of multicollinearity when the VIF value is more significant than five. The VIF values for the evaluated model are shown in Table 3.

Table 3. Results of the structural model

Path	Path Coefficient	Collinearity (VIF)	Value-t	Value-p
H1: GRH→INN	0.552	1.906	11.691	0.000***
H2: GC→INN	0.146	1.906	2.655	0.008***
Construct	Coeficient R^2			
INN	0.437			

Notes: The t and p-values were obtained from the Bootstrapping procedure with 5000 subsamples.
Abbreviations: GRH, human resources management. GC, knowledge management. INN, innovation. *p<0.1, **p<0.05, ***p<0.01.
Source: Own elaboration.

According to the results presented in Table 3, the Human Resources Management construct has a VIF of 1.906, and the Knowledge Management variable has a value of 1.906. Thus, Human Resources Management and Knowledge Management are acceptable predictors of Innovation since having VIF values lower than the limit of 5 confirms that there is no collinearity between the constructs. Therefore, the model is free of multicollinearity problems, so the structural model can be analyzed.

The second step in evaluating the structural model consists of analyzing the path coefficients, which show the relationships of the hypotheses established for the research model. The path coefficients represent the value of the estimated relationship between the exogenous constructs and the dependent variable connected through a unidirectional line. This coefficient explains to what extent each of the independent latent constructs affects the dependent variable.

According to the results shown in Table 3, the independent variable with the most significant impact on Innovation is Human Resources Management since it has a path coefficient closer to 1 than the other variables. The value of the relationship is 0.552. In this sense, it is concluded that Human Resources Management has a positive relationship and a level of explanation of 0.552 on the Innovation variable. The Knowledge Management variable has a Path coefficient that amounts to 0.146. In this sense, it is concluded that Knowledge Management maintains a positive relationship with Innovation and that its degree of incidence on the explanation of the dependent variable is 0.146.

It is necessary to verify whether the coefficients are considered statistically significant at 5% since the values obtained through Bootstrapping show t-values greater than 1.96 (11.691 and 2.655 for Human Resources Management and Knowledge Management, respectively) and the p-value of each variable is less than 0.05 (0.000 and 0.008 for Human Resources Management and Knowledge Management respectively). Based on these values, it is statistically confirmed that there is a direct and positive relationship between the exogenous constructs and the dependent variable.

The third step in evaluating the structural model consists of analyzing the model's predictive capacity through the coefficient of determination R^2. The proposal of Chin (1998) is followed, which states that the values 0.67, 0.33, or 0.10 in R^2 indicate that the explanatory capacity of the model is substantial, moderate, or weak, respectively. The value of the coefficient of determination of the designed model amounts to 0.437. In this sense, Knowledge Management and Human Resources Management together can explain 43.7% of innovation, a value indicating that the model has a moderate and acceptable explanatory capacity in social sciences.

In summary, the evaluation of the structural model shows that the model has been designed appropriately, given the values obtained in the different parameters studied. The VIF value of each construct indicates that the model does not present multicollinearity, so the variables that constitute it do not have collinearity between them. The path coefficients present positive values, confirming the direct relationship between the exogenous and endogenous variables.

Likewise, it was discovered that Human Resources Management has the most significant impact on Innovation. The analysis of the statistical parameters t-student and p-value confirms the statistical significance of the Path coefficients with 95% confidence. The coefficient of determination R^2 shows that the model has a satisfactory explanatory capacity in social studies. According to the estimated value, the variables Human Resources Management and Knowledge Management explain 43.7% of Innovation.

With the data generated by the designed model, it is possible to accept and validate the working hypothesis with 95% confidence. The working hypothesis is accepted by presenting a p-value less than 0.05 and a t-value greater than 1.96: human resource management and knowledge management positively and significantly impact the Innovation of companies in the textile industry in central-western Mexico.

DISCUSIÓN

In this study, the partial least squares technique was used to determine the existing relationship between the research variables. Based on the tests, Knowledge Management and Human Resources Management significantly influence the Innovation generated in the Textile industry.

Practical implications

This article contributes to the study of innovation in textile companies in three ways. First, the specific impact of knowledge and human resources management on innovation was theoretically developed and verified through empirical research. Second, it was found that it is necessary to acquire knowledge, but it is not only about acquiring it; the actual value of knowledge is obtained through its correct management to use it in activities that lead to some innovation. Third, the study reveals that the human part of the company also turned out to be a critical variable for innovation because the human being is the one who possesses the skills and capacities to make innovation possible; he is the source of creativity. In that sense, one can only speak of business innovation with proper human resource management.

Based on the results obtained, it can be observed that the innovation with the most significant load that companies carry out is organizational. Specifically, it generates collaborative relationships with other companies in the industry and research institutions. Subsequently, the companies studied showed that price changes are a type of marketing innovation essential for their operation. In order of importance, according to factor loadings, the third type of innovation that companies in the sector develop is product innovation through the creation of new products and the improvement of existing ones. Finally, and no less critical, is innovation in positioning, that is, in sales channels; the organizations demonstrated that the introduction of new sales channels for their product is something relevant to their activities and, through this indicator, innovations in marketing are developed, just as they are done with prices.

In the case of the independent variable Knowledge Management, loads with significant values were obtained, the highest of which was 0.779, corresponding to the manifest variable GC_2 (item related to the generation of alliances with external participants, grouped in the External indicator of the knowledge creation dimension). Items GC_1 (referring to the internal creation of knowledge), GC_4 (related to the external creation of knowledge through attendance at fairs), GC_5 (associated with the knowledge transfer dimension, through the personal communication indicator) and GC_7 (of the knowledge communication indicator coded in the transfer dimension) have external loads with Knowledge Management that amount to 0.77, 0.763, 0.725 and 0.684 respectively. The indicator with the lowest contribution, but no less significant, is GC_9 (associated with the execution of knowledge of the application dimension), with a value of 0.611 in its external load.

Based on the above, it can be stated that Knowledge Management as a variable that affects Innovation has relevant indicators for three of the four theoretical dimensions considered. Following the results of the estimation, it can be observed that the item that contributes the most to Knowledge Management is the generation of alliances with external participants (GC_2), such as clients, suppliers, and competitors, from which companies obtain information that helps them create new knowledge in the organization. The second relevant indicator is also related to knowledge creation, but at an internal level, that is, through collecting information from the company's employees (GC_1). The acquisition of knowledge at fairs and exhibitions (GC_4) is another source of information for creating knowledge in companies; according to its factor loading, it occupies third place in the list of relevant indicators.

According to its factorial importance, the personal knowledge communication indicator (GC_5), referring to the transmission of knowledge through training courses, workshops, forums, and seminars, is in fourth place; this indicator belongs to the Knowledge Transfer dimension, as does the codified communication item (GC_7), referring to the transmission

of knowledge through manuals, intranet or internet. Last, the execution of knowledge (GC_9) implies that the companies studied use the available knowledge to carry out activities that lead them to generate changes and improvements in one of the indicators already mentioned for this variable. As can be seen, the activities of the knowledge creation dimension turned out to be the most relevant for the independent variable Knowledge Management; companies constantly create knowledge from their sources of information. Knowledge transfer activities, the second dimension, are critical in organizations to develop knowledge internally and externally to reach all firm members.

Knowledge application activities, the fourth theoretical dimension considered, were considered necessary for the exogenous construct since this is the moment knowledge acquires value by being used in some significant activity. The storage dimension, represented by protecting, codifying, updating, and storing the knowledge used, was irrelevant in the Knowledge Management of the companies studied.

The Human Resources Management construct presented positive and significant relationships with its respective indicators. GRH_9 (promotion indicator, associated with the career growth of the human resource organization dimension) had the highest load with a value of 0.845, and the GRH_4 indicator (of the capabilities indicator, associated with teamwork) had the lowest value of 0.651. The manifest variables GRH_2 (occupation indicator), GRH_6 (recruitment policies indicator), and GRH_7 (training indicator) obtained values of 0.662, 0.684, and 0.77 in their external loads, respectively. Based on the above, it can be observed that Human Resources Management is an activity that companies carry out and value as a factor that contributes to improving the innovation activities already mentioned. In this independent construct, exciting results were obtained from the point of view of its factorial loads. Following this indicator as a measure of contribution to Management, it can be concluded that the possibility of job growth, that is, promotion (GRH_9), is a factor that encourages creative and innovative skills in employees. In that sense, it is fundamental as an action within Human Resources Management.

Secondly, it was found that training (GRH_7), referring to the delivery of training courses for developing skills, is another factor contributing to the Management of this variable. Thirdly, the recruitment policies indicator (GRH_6) is associated with the search and selection activities of personnel with creative skills that can contribute to innovation. Each of the activities indicated belongs to the Human Resources Organization dimension; in that sense, these actions are the most developed within the companies studied in the analysis and contribute to the Management activity being carried out.

According to its factor loading, the occupation indicator (GRH_2) is in fourth place. This item shows that jobs associated with administration and engineering are relevant for

innovation. In this sense, the occupational structure is a significant dimension of the company's Human Resources Management process.

Regarding teamwork and problem-solving, the capabilities indicator (GRH_4) occupies fifth place in factor loading. This activity is also present in the organizations studied and shows that the competencies dimension is relevant for managing the variable. According to the above, the activities focused on the organization of human resources are those with the most significant weight for human resource management, followed by the jobs included in the organizational structure dimension and by the capacity of employees to work in a team, which refers to the competencies of the staff. Each of these Human Resource Management activities positively impacts the Innovation of the companies studied in any of its three relevant dimensions (Product, Marketing, and Organizational). In the case of the workforce qualification dimension, associated with the level of education of employees, its irrelevance to the model was shown.

Theoretical Implications

Some results of this research coincide with those obtained by de Moraes e Soares (2024), who mention that "textile companies urgently need to invest in R&D to increase the industry's efficiency. The study points to the need to define strategies to improve the efficiency of economic activities and promote a plan based on competitiveness, adaptability, and greater efficiency in Portugal's textile and clothing industry (de Moraes e Soares et al., 2024).

Likewise, this research coincides with the work carried out by José Moleiro Martins (2024), both in the objective and in some results of the research: "This study aims to comprehensively investigate the role of knowledge management and innovation as crucial drivers of competitiveness in textile companies," the study seeks to explore the academic landscape, identify trends and unravel patterns related to knowledge management and innovation in the textile industry.

The study identifies critical themes, explores collaborative networks, and assesses gaps in existing knowledge. The study reveals a multidimensional exploration of the textile industry, emphasizing innovation, knowledge management, competition, and sustainable development. The analysis highlights the fundamental interaction between knowledge management and innovation in shaping competitiveness, and academic interest in this topic is increasing. China appears to be one of the main contributors to global engagement (Martins, 2024).

This study examines the relationship between human resource management, innovation, and firm performance. It recognizes the direct effect of human resource management on innovation and its indirect impact on firm performance, showing that human resource

management plays a vital role for enterprises. This result also implies that to promote innovation and improve firm performance, enterprises can build and operate human resource management as a preferred solution in the market context, which is increasingly under competitive pressure today.

The combination of innovation in all its forms and random variables, such as human resource management, knowledge management, and mainly sustainability and care for the environment, appear as future challenges for the textile industry. The challenge is complex since the fashion industry has short product life cycles, various products, unpredictable and volatile demand, and long and inflexible supply chains (Brydges, 2021).

CONCLUSIONS

According to the results already discussed, innovation is not something foreign to the companies in the sector studied; instead, it is an activity that they carry out constantly, even without even knowing that they are doing so. The innovation task is perceived in three dimensions: Product, Marketing, and Organization. The Process dimension did not turn out to be a relevant activity in the region analyzed. This study provides evidence that HRM practices influence innovation and creativity in firms, thereby indirectly contributing to improved firm performance.

The results of this study also show that workers play a crucial role in the production, diffusion, and absorption of knowledge. Therefore, to improve the overall efficiency of textile companies and create innovations, the training of human resources in organizations should be the first aspect to be considered.

Our study provides evidence that human resource management influences innovation and creativity within enterprises, indirectly contributing to improved firm performance. Innovation is not a phenomenon that occurs in isolation, being fostered by a single factor, but rather an activity that develops from different variables that, individually and as a whole, contribute to improving the levels of innovation in companies. The constructs of human resource management and knowledge management then turned out to be two variables that effectively positively impact innovation. This impact was statistically proven through the analysis of the Path coefficients, through which the general hypothesis of the work was accepted as valid. The two factors can explain 43.7% of innovation in companies in the sector studied.

Furthermore, human resource management contributes to innovation performance by fostering an organizational culture that values creativity, collaboration, and continuous learning, cultivating a workforce that generates and implements innovative ideas.

The results allowed for analyzing innovative and non-innovative textile companies. By classifying the companies studied as innovative and non-innovative, it is possible to make a more in-depth analysis of those that do introduce innovations and, in this way, to know more precisely what type of innovations are carried out in the organizations of the study area. Regarding the companies labeled as non-innovative, it can be deduced that, in addition to not being a significant percentage of the total studied, they are organizations that have yet to overcome one or more of the barriers indicated in the theoretical section.

The existence of companies that do not innovate is not desirable. However, their minimal representation in the sample shows that the innovation variable is a factor of interest for most companies in the territory today since almost 97 out of 100 companies are striving to make changes to improve their results, all through innovation. These findings open up new possibilities for future research, which is an essential contribution of this research.

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Massive Transformative Purpose (MTP) as moderator in the relationship between Culture of Experimentation and Autonomy

Propósito de Transformación Masiva (PTM) como moderador en la relación entre Cultura de Experimentación y Autonomía

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ABSTRACT

The present research seeks to measure the relationship between the culture of experimentation and autonomy and the relationship between both variables when moderated by the organization's massive transformative purpose (MTP). This quantitative and exploratory research was conducted through a questionnaire for decision-makers in 43 medium and large IT companies in Jalisco. The results reveal a significant positive relationship between the culture of experimentation and autonomy, corroborating the first hypothesis of this research. However, according to the analyses to calculate the degree of moderation of the massive transformation purpose variable (moderator variable) to adjust the relationship between the culture of experimentation and autonomy, the results showed that there are no significant relationships, which rejects the second hypothesis of this research.

Keywords: Massive transformative purpose, exponential organizations, culture of experimentation, autonomy, competitiveness.

JEL code: O39

RESUMEN

La presente investigación busca medir la relación que existe entre la cultura de experimentación y la autonomía, así como la relación entre ambas variables cuando se ven moderadas por el propósito de transformación masiva (PTM) de la organización. Esta investigación de tipo cuantitativa y exploratoria se realizó mediante un cuestionario aplicado a tomadores de decisión en 43 empresas medianas y grandes del giro de tecnologías de la información en Jalisco. Los resultados obtenidos revelan que existe una relación positiva significativa entre la cultura de experimentación y la autonomía, corroborando la hipótesis planteada en esta investigación. Sin embargo, de acuerdo con los análisis para calcular el grado de moderación de la variable propósito de transformación masiva (variable moderadora) para ajustar la relación entre cultura de experimentación y autonomía, los resultados arrojaron que no existen relaciones significativas, con la cual se rechaza la segunda hipótesis de este estudio.

Palabras clave: Propósito de transformación masiva, organizaciones exponenciales, cultura de experimentación, autonomía, competitividad.

Código JEL: O39

INTRODUCTION

The role of knowledge management, human resources management, and innovative performance within textile firms enhance the organization's performance. The textile industry has become a critical component of the global economy and daily life. Consequently, an assessment of input utilization that considers innovation, technology, and efficacy is imperative (Haider & Anees, 2024; Sanchez et al., 2019).

This research addresses the topic of massive transformative purpose (MTP), the guiding axis of exponential organizations (ExOs), which can be defined as the greater intention to which the company aspires and is distinguished from the motto or mission of the organization for being highly ambitious; they aim to capture the hearts, minds, imagination and ambitions of those inside and especially outside the organization (Church, 2024); some seek to transform the planet, others just a sector, but radical transformation is the key (Ismail et al., 2014).

Among the organizations that are considered exponential are companies such as *Uber, Netflix, Tesla, Zoom Video, Airbnb, Waze, Snapchat, BlaBlaCar,* etc., young companies with less than ten years of foundation and that are recognized globally; several of them are even positioned within the 100 most valuable brands in the world according to figures published by Kantar Brandz (2024).

According to experts (Li & Shepherd, 2024; Moro-Visconti, 2024) in innovation, exponential organizations are the present and future of global businesses, operating under a light infrastructure that allows them to adapt quickly to environments of high uncertainty and, at the same time, relying on so-called exponential technologies, they have managed to reduce yesterday's high operating costs. Furthermore, given the relevance of the approach under which these companies operate, even due to the COVID-19 pandemic, several registered significant exponential growth due to the use of technology through digital media, which is critical to their success. It is pertinent to delve deeper into this phenomenon and its dimensions to bring it closer to companies that still operate traditionally.

It should be noted that there is also a close link between exponential organizations and a culture of experimentation, not coincidentally that one of the elements of the ExO model created by Ismail et al. (2014) is indeed experimentation. Furthermore, since the ExO model is closely linked to the *Customer Development* model proposed by Blank (2009), the *Design Thinking* model devised by Brown (2008), and the *Lean Startup* model by Ries (2012), its creators position experimentation as a fundamental part of their innovation models, is that culture of experimentation takes on an essential role in organizations that seek competitiveness in global digital markets. Also, as a result of the literature review, it was

possible to find that autonomy is the common denominator that both phenomena share. Hence, this research aimed to measure the relationship between the culture of experimentation and autonomy and the moderating effects of the massive transformative purpose to adjust the relationship between both variables in medium and large IT enterprises in Jalisco.

THEORETICAL-CONCEPTUAL FRAMEWORK

The Origins of Exponential Organizations

The ExO concept has its roots in the law of exponential growth proposed by Gordon Moore (co-founder of Intel) in 1965, which stated that the number of transistors per square centimeter in an integrated circuit would double each year and that the trend would continue for the next two decades; Ten years later he modified his statement and predicted that the rate would slow, and that transistor density would double approximately every 18 months. This exponential growth rate in transistor density, doubling the capacity of microprocessors every year and a half, is what is considered Moore's Law (Cheang, 2005).

Despite not appearing as a reference in the book Exponential Organizations by Ismail et al. (2014), nor to relate his work as a precursor of the concept of exponential organizations, it is vital to highlight the work of Drucker (1969), who more than 50 years ago was already talking about economic, political, social and cultural changes linked to the emergence of new technologies and the innovation connected to it, as well as new business models that would emerge from technology.

Years later, Kurzweil (1999; 2001) returned to and deepened Moore's law of exponential growth, developing *the Law of Accelerated Returns*, where he stated that the duplication pattern identified by Gordon Moore in integrated circuits applied to any technology. That is, the law includes future technologies far from integrated circuits.

Another theory of innovation that was undoubtedly reviewed to build the concept of exponential organizations is the theory of disruptive innovation by Christensen and Raynor (2003), which describes a process through which smaller companies with fewer resources can challenge with success to leading organizations in the industry, which direct their efforts to improve their products and services for their most profitable clients, ignoring the needs of some market niches. Leading organizations pursuing greater profitability in more demanding segments tend not to respond on time, and this is when new competitors enter the market, delivering the value that clients of established companies require. Conventional customers begin to adopt the new competitor's offerings in volume when disruption occurs (Christensen et al., 2015).

According to Ismail et al. (2019), another theory that was fundamental for the concept construction of exponential organizations and that is used in exponential transformation sprints is the *Customer Development* methodology developed by Blank (2009), in which all the activities related to the creation of customers for an emerging company in its initial stage are outlined. Unlike traditional innovation models that present a linear approach, these are grouped into a series of steps and are designed to carry out several iterations in each step until the desired result is reached (Blank, 2009).

The *Design Thinking* methodology Brown (2008) developed was also a precursor for exponential organizations. This theory is based on designers' sensitivity and methodology to match users' needs with what is technologically feasible and what a commercial strategy can convert into value for customers. According to Brown (2008), the attributes inherent to designers and on which this methodology is based are *empathy, integrative thinking, optimism, experimentalism, and collaboration*.

Design Thinking should be considered a system of overlapping steps that can be repeated rather than an ordered sequence of steps, which means that projects that are born under this scheme can go back through each step of the model more than once as the team refines ideas and explores new directions (Brown & Wyatt, 2010).

The concept of exponential organizations was also nourished by the work of Hagel III et al. (2010) and their theory of the *Power of Attraction*, which arises as a response to the uncertainty of companies, consumers, and markets by leveraging digital infrastructures and the flow of knowledge that allow them to "scale learning" both within the organization and throughout its ecosystem. Derived from this theory and as a methodology to carry out successful institutional change in organizations, Hagel III et al. (2019) developed a new approach for large-scale organizational transformation called *Scaling Edge*, where guidelines are set to continue within the organization to achieve this transformation.

The *Lean Startup* theory proposed by Ries (2011) also served as the basis for building the ExO model. Like the methodologies of Brown (2008) and Blank (2009), the Lean Startup methodology proposes the launch of businesses from learning that is validated through a sequence of steps that begin with the idea of a product or service, in which its impact on the market and acceptance by potential clients is measured; From this feedback, learning is obtained that allows the product to continue developing iteratively, either by increasing the functionalities or establishing a series of changes that will enable its viability. The above allows the creation of a profitable business model without wasting resources (Ries, 2011).

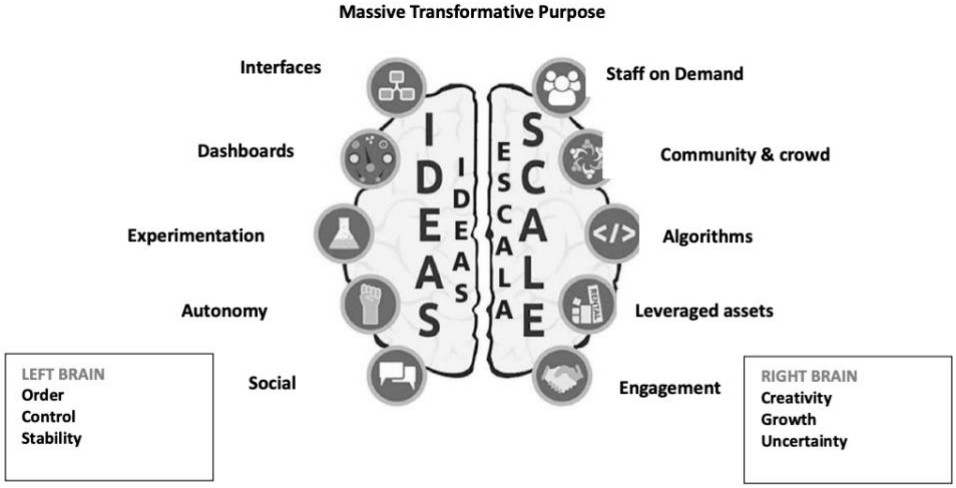
In addition, theories about the future and abundance also served as a source of inspiration for creating the concept of exponential organizations. During the last two decades, humanity has evidenced a technological acceleration unlike anything the world has seen, where exponential progress in artificial intelligence, robotics, infinite computing, ubiquitous broadband networks, digital manufacturing, nanomaterials, and synthetic biology, among many others, will allow more extraordinary advances to be achieved during the next two decades than what has taken place in the last 200 years. (Hellebrand, 2017)

Exponential Organizations

Exponential organizations (ExOs) is a term that defines organizations whose impact or result is disproportionately large, at least ten times greater compared to their peers, due to the implementation of new organizational techniques that take advantage of exponential technologies (Ismail et al. al., 2014). This definition arises from the results of the analysis of the hundred fastest-growing startups in the world, carried out between 2008 and 2014, and how these companies presented accelerated growth in less than six years after starting operations. The significant characteristic of ExOs is that, instead of having a robust payroll or extensive physical facilities, exponential organizations are built on information technologies that take what was once physical or tangible and dematerialize it in the digital world on demand.

Among the characteristics of an ExO (Figure 1) is that they maintain a minimal core of employees and physical facilities, which allows great flexibility while margins rebound. They recruit users and leverage virtual and physical communities for everything from product design to app development. They ride on existing and emerging infrastructures rather than trying to own their own, and they grow at a breakneck pace because they are not focused on taking ownership of their market (Ismail et al., 2014).

Figure 1. Exponential Organizations Model



Source: Ismail et al. (2014).

According to Ismail et al. (2014), the ExO model includes 11 key attributes guided by a massive transformative purpose, which is a very ambitious change goal. As for the internal and external dimensions that come together to achieve exponential growth in the ExO model, the acronym SCALE reflects the five external attributes. The acronym IDEAS is used for the five internal attributes. The meanings of each attribute are described below:

Staff on Demand. Employing personnel on demand involves renting labor based on the company's current needs (Chen & Yang, 2023). The main benefit of using on-demand staff is that it allows agility, encourages learning (with new perspectives), and creates stronger bonds between the core team (Peng & Chen, 2023).

Community and Environment. An organization or company's "community" comprises core team members, alumni (former team members), partners, vendors, customers, users, and fans (Meuser & Smallfield, 2023).

Algorithms refer to tools used to improve and automate a company's resources. Examples of such algorithms are Machine Learning (based on known properties) and Deep Learning (based on neural network technology). These enable fully scalable products and services, leveraged connected devices and sensors, lower error rates, and easy upgrades (Abousaber & Abdalla, 2023).

Leveraged Assets ("non-own" External Assets) refer to renting, sharing, or taking advantage of the assets of others rather than owning things. It is based somewhat on a post-materialist philosophy in which renting assets or tools can be done at a fixed price or as an on-demand service. (Li & You, 2023)

Engagement (Commitment) consists of digital reputation systems, games, and incentives that provide the opportunity to gain positive feedback loops, triggering faster growth in consumer loyalty (Gupta et al., 2023).

Interfaces. Interfaces are filtering and matching processes, that is, how external attributes (SCALE) are transformed into internal control frameworks (IDEAS); interfaces are geared toward filtering and shaping (Kecht et al., 2023).

Dashboards (Control Panels). Dashboards allow an organization to manage itself. For example, an organization could implement a real-time adaptive dashboard with all essential company and employee variables accessible to everyone.

Experimentation (Culture of Experimentation). Keep processes aligned with rapidly changing externalities. It is a lot about allowing failure to improve and iterate even more in product or service innovation; experimentation maximizes value creation and drives a mindset that controlled risks can offer an advantage and faster learning.

Autonomy. Self-organized, multidisciplinary teams that operate with decentralized authority. For example, the company hires innovative and talented initiators who decide which projects to join and are encouraged to start new projects. The benefits of this model include greater agility, greater accountability to the customer, faster reaction, learning times, and higher morale.

Social (Social Tools) refers to social technologies, given that workplaces are increasingly digitalized. Social technologies create fertile ground for cooperation and efficient feedback loops, allowing for faster conversations, decision-making cycles, accelerated learning, and team stabilization during rapid growth.

Not all ExOs have all ten attributes, but the more they have, the more scalable they tend to be. According to Ismail et al. (2014), presenting at least four attributes turns the organization into an ExO, contributing to its acceleration. More than an explanation, exponential organizations are a mindset, a choice that companies make to become more competitive and survive in the long term (Margherita et al., 2020). Furthermore, while traditional organizations tend to be hierarchical, centralized, and closed while operating around an ownership model based on scarcity (of people, resources, assets, platforms, etc.), exponential organizations embrace and take advantage of openness, transparency, and abundance; ExOs focus outward and not inward, which gives them an advantage over other companies (Diamandis & Kotler, 2015).

The Massive Transformative Purpose

To understand the model of an exponential organization, it is necessary to highlight the pillar that supports and serves as the compass of the organization: the massive transformative purpose, which is defined as the most significant intention to which the company aspires and is distinguished from the mission of the organization for being highly ambitious; they aim to capture the hearts, minds, imaginations and ambitions of those inside and especially outside the organization; some aim to transform the planet, others just a sector, but radical transformation is the key (Ismail et al., 2014).

Dieffenbacher (2024) states that most professionals understand the mission statement and core business activity concepts. However, the MTP takes these elements several steps further by using them as a significant point for generating innovation and motivation (Zhang & Chun, 2023). It is worth highlighting that organizations that work behind an MTP are not only pursuing success; they want historical developments that positively impact people globally. (Table 1)

Table 1. Example of MTPs

Organization	MTP
TED	Ideas worth spreading
Google	Organize the world´s information
Boston Children´s Hospital	Until every child is well
Quirky	Make invention accessible
Word Top 20 Project	Educate every child on the planet

Source: Own elaboration.

Regarding the relevance of the Massive Transformative Purpose in innovation, Palao (2022) presented a platform developed from global challenges and solutions to problems guided by a purpose called *Purpose Launchpad*. This framework, where the purpose serves as the north star that directs each of the initiatives, can be used as a guide to give structure to organizations, products, and services to empower them and create a better world, that is, one that does not only solve a problem or need in the market but also has a positive impact worldwide. This methodology has at its core a superior reason that helps organizations create purposeful initiatives, helping them to be sustainable for the environment in a responsible manner and allowing their impact and reach to be more significant. According to Palao (2022), developing innovations that have a positive impact does not have to do with technology and its use but with the mentality with which things are done, which is why the Purpose Launchpad is a tool that helps create that mindset to be purpose-driven innovators.

Culture of Experimentation

As previously established, it is impossible to deny the close link between exponential organizations and the culture of experimentation. However, it is not in vain that one of the

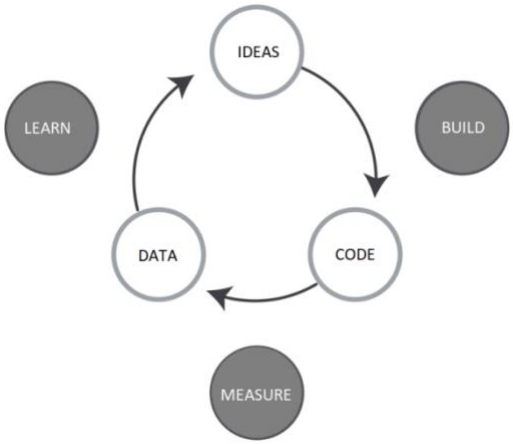
elements of the ExO model created by Ismail et al. (2014) is precisely experimentation. Furthermore, since the ExO model is intricately linked to the theories of *Customer Development, Design Thinking, and Lean Startup*, in which its creators position experimentation as a fundamental part of their models, the culture of experimentation takes on a leading role in generating innovation within organizations.

According to Seelos and Mair (2012), innovation as experimentation can be a more important mechanism for progress, so they insist that organizations must manage innovation as a process rather than a result. Although the error rate of this type of innovation is high, experimentation that leads to innovation failures can gradually improve an organization's understanding of how a particular environment works.

For Ismail et al. (2014), experimentation, as an attribute of the ExO model, is defined as implementing Ries's (2012) Lean Startup methodology of testing hypotheses and continuously experimenting with controlled risks. According to the authors and this perspective, the experimentation of new ideas and the iteration of processes currently represent the only way to reduce risks in business, promoting the generation and development of ideas from the bottom up in the organization, and where the best business ideas are those that are developed regardless of who proposed them. This practice contradicts the traditional "waterfall" approach to new product development used today by most companies. It follows sequential steps such as idea generation, concept screening, product design, development, and commercialization. According to Ismail et al. (2014), this process requires a significant amount of time and investment, which usually results in products that do not fit the current customer needs due to constant market change.

In contrast, under the same scenario, the organization first investigates the customer's needs using the Lean Startup methodology. Then, experiments are conducted to determine whether the proposed product fits them. This provides quantitative and qualitative evidence that helps obtain a conclusion (Figure 2).

Figure 2. The build-measure-learn feedback loop.



Source: Ries (2012).

This methodology allows us to determine in just a couple of weeks or months whether a product or business idea is destined for success or failure at a minimum cost (Ismail et al., 2014).

In this regard, Smith & McKeen (2003) propose the following recommendations to begin experimentation in organizations:

1. **Provide space and time for experimentation**. Experimental thinking uses a different type of intellectual capacity that requires a disconnection from usual tasks and activities, so organizations that wish to promote a culture of experimentation must provide appropriate places and spaces for people to take time away from their daily activities to think, interact, contrast ideas and design experiments (Berman & Marshall, 2014; Ajayi & Udeh, 2024).

2. **Use multifunctional teams.** Internal cross-functional experimental teams can sow the seeds of change in broad organizational cultures, helping them learn from failures and become comfortable with uncertainty; some experiments should even include customer participation.

3. **Establish new ways of financing and governing experiments.** Experimentation cannot and should not compete with other IT projects, so organizations must develop quick and effective ways to commit, fund, and terminate an experiment.

4. **Reduce known unknowns (things we know we do not know)**. The key to a practical experiment is to reduce the known unknowns by focusing on what can be done with greater certainty, such as results, processes, communication, objectives, vision, and requirements (Kane et al., 2015).

5. **Rethink the role of failure**. Celebrating failure and what has been learned is essential to developing a culture of experimentation, so leaders must talk openly about failures

and then implement what they learn in future experiments. This is the best way to keep new ideas and innovations flowing (Smith & McKeen, 2003).

6. **6. Build on what you learned.** Although not all experiments prove their hypotheses successfully, all should inform strategy. The key is to learn from the results and then pivot; consider experiments as a journey and not as a road map; that is, learn and then adjust (Smith & McKeen, 2003).

Correspondingly, for Berman and Marshall (2014), experimentation in business is a strategy to reduce uncertainty and deal with disruption. There are many reasons to conduct experiments, including testing hypotheses, validating assumptions, and reducing uncertainty. For Thomke & Manzi (2014), the key is to have clarity about what is being tested and what the organization wants to learn to design the appropriate experiments and that this culture emanates directly from the most experienced leaders, who will provide the resources, the guidelines and structure for experimentation (Browning & Ramasesh, 2015). At the organizational level, fostering a culture of experimentation, encouraging cross-functional collaboration, and establishing flexible structures are highlighted as critical success factors (Addy et al., 2024).

According to Thomke (2020), in his article titled "Building a Culture of Experimentation," published by the Harvard Business Review, the main obstacle to companies not experimenting is not the absence of tools or technology but the culture, that is, shared behaviors, beliefs, and values. For every experiment that succeeds, almost ten do not, and in the eyes of many organizations, succeeding after so many failures is a waste of time. Therefore, the author proposes a series of attributes that organizations must implement to make experimentation an integral part of daily activities, which are described below:

1. Cultivate curiosity. Everyone in the organization must value surprises despite the difficulty of attributing costs and the impossibility of predicting when and how they will occur. When companies adopt this mindset, curiosity will prevail, and people will perceive failures not as costly mistakes but as learning opportunities. (Li et al., 2023)

2. Insist that data outweigh opinions. Empirical results from online experiments must prevail even when they clash with solid opinions, regardless of who these opinions come from. (Riesthuis & Woods, 2024)

3. Democratize experimentation. Anyone in the organization, not just people in Research and Development (R&D), should be able to run experiments to test any new idea to improve the business; this involves giving teams the autonomy they need to try new approaches that they consider can add value and facilitating a system that

allows running, monitoring, and providing real-time feedback on experiments. (Santos, 2023)

4. Be ethically sensitive. When planning new experiments, organizations should carefully analyze whether users might consider the tests unethical. While the answer is only sometimes clear, organizations that fail to delve deeper into this point risk provoking a backlash. (Abdulqade et al., 2024)

5. Adopt a different leadership model. More experienced leaders should set challenges that can be broken down into testable hypotheses and critical performance metrics. They must also secure systems and resources that facilitate large-scale experimentation, live by the same rules as everyone else, and put their ideas to the test. Ultimately, being a leader in an experimentation-driven organization means letting go and empowering employees to do their testing. (Boeske, 2023).

It is essential to emphasize that leadership is critical in encouraging experimentation within organizations. According to Hussain (2024), leaders in the organization play a decisive role in driving cultural transformation by promoting a culture of experimentation and learning, fostering a digital mindset, and empowering employees to embrace new technologies. By creating an environment where employees feel empowered to contribute innovative ideas, leaders ensure that their organizations remain dynamic and responsive to changes in market dynamics (Agustian et al., 2023).

In this sense, entrepreneurial leadership emerges as a critical driver of innovation, resulting from a unique combination of visionary thinking, risk-taking propensity, adaptability, and resilience that enables individuals to navigate and thrive in dynamic business environments (Ishak et al., 2021); these types of leaders demonstrate a keen sense of foresight, are not afraid of calculated risks, and possess the ability to adapt quickly to changing circumstances (Groves & Feyerherm, 2022).

Autonomy

Although there has yet to be a consensus on the definition of organizational autonomy, and the concept needs to be more specific and cohesive at the conceptual level (Arregle et al., 2023), the definition proposed by the authors of exponential organizations will be used for this study. Autonomy is one of the critical elements in the ExO model, and Ismail et al. (2014) define it as self-organized and multidisciplinary teams that operate with decentralized authority. According to the authors, much of the success of the experiments lies in relying on small, independent, and multidisciplinary teams to build new businesses from the idea phase to commercialization.

The benefits of this model include greater agility, greater accountability to the customer, faster reaction and learning times, and higher morale (Ismail et al., 2014). This is consistent

with the studies by Moalagh et al. (2023) on agile methodologies, which highlight that implementing agile methods, commonly used in technology and software development companies, often increases team autonomy and flexibility while raising organizational demands for agility and efficiency.

According to Thomke (2020), to successfully generate a culture of experimentation, it is essential to create an environment where the curiosity of employees is cultivated, where data outweighs opinions, where anyone (not only R&D) can carry out a test, where all experiments are carried out ethically, and managers adopt a new leadership model. According to the author, the main obstacle why companies do not conduct experiments is not the absence of tools or technology but culture, that is, shared behaviors, beliefs, and values (Thomke, 2020); this is where autonomy becomes highly relevant in the implementation and execution of experiments.

One of the most transparent and compelling examples of how autonomy and experimentation are linked was presented by Thomke (2020), who described the strategies implemented by the digital giant Booking.com, which, after running twenty-five thousand experiments per year, went from being a small startup to the most prominent travel platform in the world. The experiment that changed everything for this company consisted of testing a new version of the Home Page, where instead of offering multiple options for hotels, vacations, and travel discounts (as they always did), this new page would only show a small window asking the user about their destination, travel date and several people traveling, with only three simple options to choose from: hotels, flights, and car rental. This experiment was only possible because if it had not been done, it would have violated one of the fundamental principles of Booking.com, which is that anyone in the organization can try anything without permission from management.

METHODOLOGICAL DESIGN

This quantitative nonexperimental research was conducted using convenience sampling of 41 IT companies in Jalisco, Mexico; the questionnaire was applied to decision makers (directors, managers, and heads of departments) of HR, IT, R&D, Administration, and Sales, who are responsible for planning, structuring, and executing strategies at the corporate level, as well as invariably participating in the construction of culture within an organization. The questionnaire was validated by applying a pilot test to measure the relationship between the culture of experimentation, autonomy, and the purpose of massive transformation.

It was decided to study IT companies (mostly companies that generate innovation) since their profile turns out to be a breeding ground for experimental practices by taking advantage of

the technology they market that is within their reach to optimize their operations and positively impact their environment. Likewise, IT companies are the spearheads and set the example for businesses in other industries, and they are responsible for bringing innovation to all segments.

The questionnaire was applied individually to decision-makers who work in the selected companies through a phone call between November 17 and December 7, 2021. The list of IT companies was obtained from a database on the National Statistical Directory of Economic Units portal of INEGI (2018). In addition, this list was completed with companies found on LinkedIn and in IT directories in Jalisco to accomplish the number of surveys proposed for this research and the limited access to the study subject (decision makers within the organization). The final database was made up of 41 enterprises, of which 27 entities correspond to medium-sized companies, which are detailed below (Table 2):

Table 2. Name of medium-sized enterprises that were considered for the study.

Company name	Industry	Scope
Desarrollos Eslabon Systems	HR solutions	National
Gbnetworks	Ecommerce	Local
Itexico Services Medico Net	Semiconductors & Components	Local
Ecosa	Artificial intelligence	National
Karaokulta Amber Kao	Software	National
Seguridad y Control	Consultancy	National
Epam Systems	Software	National
Assetel	Software	International
Moduslink	Ecommerce	National
Sanmina	Hardware	National
Accend Consulting	Consultancy	National
IBM	Networks & telecommunications	International
Global Fleet	Semiconductors & Components	International
Atalaya Systems	Communication technologies	International
Visuel Sistems	Video games	International
Avnet	Software	International
Teratronix	Ecommerce	National
Avansys	Cybersecurity	International
Estrasol	Software	National
Technology & Performance	Software	International
Toshiba	Software	National
Improving	Software	International
AstraZeneca	Pharmaceutical	International
121 (One Twenty-One)	Digital Advertising	International
Sisa Consultores	Consultancy	National
Kire Informática SA de CV	Software	International

Inbest	Software	National

Source: Own elaboration.

Regarding large enterprises, the database comprised 14 entities, which are detailed in Table 3. The scale was developed from the questionnaire to Calculate the Exponential Quotient of an Organization (Ismail et al., 2014). It was completed with information obtained from the reports on Digital Coming of Age and Accelerating Digital Innovation (Kane et al., 2018, 2019) published by MIT Sloan Management Review and Deloitte, from where different items were selected, adapted, and transformed to measure each of the variables proposed in the model of this study.

Table 3. Name of large enterprises that were considered for the study.

Company name	Industry	Scope
Contpaqi	Networks & telecommunications	National
Ho1a Innovación	Development	National
Izzi	Networks & telecommunications	International
Sky	Consultancy	International
Oracle	Networks & telecommunications	International
Sumitomo Electric Industriales	Software	International
Oracle de México	Semiconductors & Components	National
Tata Consultancy Services de México	Consultancy	International
Ikor	Consultancy	International
Advanced Technology	Ecommerce	National
Pegasus Control	Software	International
Kpmg	Audit service	International
Gopac Soluciones Integrales SA de CV	Consultancy	International
Hostime	Software	International

Source: Own elaboration.

The questionnaire was made up of a total of 15 items on a 5-point Likert scale, where (1) is Completely Disagree, (2) Disagree, (3) Neither Agree nor Disagree, (4) Agree, and (5) agree. The study subjects responded by assessing their agreement or disagreement with each of the items that make up the scale. The scores the subjects gave to the items reflect whether they present positive attitudes towards a culture of experimentation, autonomy, and a massive transformative purpose within their organizations. The 15 items were expressed positively; therefore, a high score (greater than 3) would indicate favorable attitudes or beliefs in each area. See Table 4 for the complete list of questionnaire items.

Table 4. Questionnaire items and source

Variable	Questionnaire items	Source

Culture of Experimentation	In my organization, tests or experiments are constantly carried out to validate new products and/or services.	Ismail et al. (2014😉 Ajayi & Udeh (2024)
	In my organization, sessions are held in which many employees participate by contributing ideas about new products or services to offer.	
	In my organization we could conduct experiments to validate new business ideas.	Kane et al. (2019); Ajayi & Udeh (2024)
	In my organization, a specific budget or resources have been designated to generate innovation.	
	In my organization, leaders share the results of tests or experiments with everyone involved to promote our learning.	Kane et al. (2018)
	In my organization, the acceptance that a new business, product or service idea will have is measured before its formal launch to the market.	Own elaboration
	In my organization, new ideas are encouraged to be shared and evaluated by all Departments of the company.	Kane et al. (2018)
Autonomy	The Departments are structured as small self-organizing teams. Departments can make key decisions independently, that is, decisions are decentralized.	Ismail et al. (2014)
	Each Department leader has considerable autonomy regarding how to achieve the team's goals.	Kane et al. (2019)
	The autonomy of each Department is influenced by the purpose, mission and values that my organization has.	Own elaboration
Massive Transformative Purpose	My organization's Mission goes beyond serving customers; The goal is to bring positive change to our entire ecosystem of suppliers, partners, shareholders and collaborators.	Ismail et al. (2014)
	The purpose of my organization goes beyond a simple Mission, that is, it seeks to create a positive impact on our society.	
	The strategic purpose of my organization goes beyond economic profit.	Kane et al. (2019)
	There is a strategic identity rooted in a greater purpose, inspiring and with values.	

Source: Own elaboration.

Problem Statement

After an exhaustive review of the published literature on exponential organizations (Ismail et al., 2014), the culture of experimentation (Smith & McKeen, 2003.; Thomke, 2020), and as mentioned in the introduction of this research, the relationship between exponential organizations and culture of experimentation already exists, as experimentation is indeed one of the critical attributes of the ExO model. However, due to the relevance of massive transformative purpose as the guiding axis of the ExO model, the intention arises to link it to the culture of experimentation phenomenon and determine whether it is related to the autonomy of teams and collaborators. Therefore, the central question that guided this

research was: Could the massive transformative purpose moderate the relationship between the culture of experimentation and autonomy in medium and large IT companies in Jalisco?

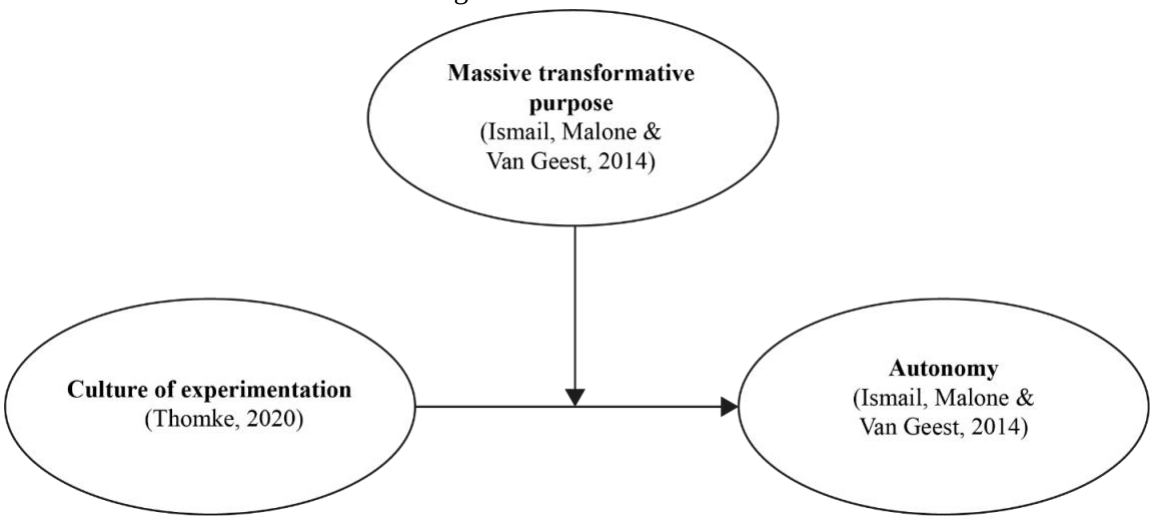
Research Objectives

This research sought to measure the relationship between the culture of experimentation and autonomy and the moderating effects of the massive transformative purpose to adjust the relationship between both variables in medium and large IT enterprises in Jalisco. The specific objectives emerge from the general objective and aim to establish the following:

1. Determine the relationship between the culture of experimentation and autonomy in medium and large IT companies in Jalisco.
2. Analyze the relationship between the culture of experimentation and autonomy moderated by a massive transformative purpose in Jalisco's medium and large IT companies.

For this research, a culture of experimentation moderated by a massive transformative purpose model was designed based on the publications of Ismail et al. (2014) and Thomke (2020), which is presented below (Figure 3):

Figure 3. Variable model



Source: Own elaboration.

Hypothesis

According to the ExO model proposed by Ismail et al. (2014) and Thomke's (2020) publications on the culture of experimentation in organizations, where autonomy can be perceived as the link between both phenomena, this research suggests that the massive transformative purpose could play a role as a moderating variable to adjust the relationship between the culture of experimentation (independent variable) and the autonomy (dependent variable), such that:

H1. The culture of experimentation is positively related to the autonomy of teams and collaborators.
H2. The massive transformative purpose positively affects the relationship between the culture of experimentation and the autonomy of teams and collaborators.

Collection and processing of information

The instrument's reliability was evaluated through an inter-item reliability analysis with Cronbach's Alpha test, as a single instrument and separately, and the KMO test. Subsequently, the relationships between the variables that make up the scale were examined using the Pearson correlation coefficient.

A moderation analysis was conducted to establish the degree of moderation of the variable massive transformative purpose (moderator) and to adjust the relationship between the culture of experimentation (independent variable) and autonomy (dependent variable). Finally, a contrast analysis was conducted for the variables with the t statistic to determine whether the null hypothesis was rejected or accepted. The tables and graphs presented below were extracted from the data analysis conducted in SPSS version 23.

RESULTS

The reliability analysis of the 15 items of the scale provided a value of α = .946. Table 5 summarizes the results obtained from the validity and reliability analysis of the instrument by subscale. Consequently, the scale was composed of 15 items that measure the phenomenon of culture of experimentation, autonomy, and massive transformative purpose in organizations.

Table 5. Validity and reliability analysis of the instrument.

Subscale	items	Cronbach's alpha	KMO	Bartlett's test of sphericity (p value)	Communality	Total variance explained
Culture of experimentation (CEXP)	CEXP_1	0.919	.805	Chi squared 88.458 df 21 p-value 0.000	.670	71.313
	CEXP_2				.736	
	CEXP_3				.702	
	CEXP_4				.624	
	CEXP_5				.752	
	CEXP_6				.750	
	CEXP_7				.758	
Autonomy (AUT)	AUT_8	0.887	.664	Chi squared 79.864	.637	79.265
	AUT_9				.847	

	AUT_10			df 6	.830	
	AUT+MTP_11			p-value 0.000	.856	
Massive transformative purpose (MTP)	MTP_12	0.964	.764	Chi squared 87.287	.939	90.245
	MTP_13				.912	
	MTP_14			df 6	.782	
	MTP_15			p-value 0.000	.976	

Source: Own elaboration.

Level of correlation between variables

The hypotheses of the relationship between the variables were analyzed through the Pearson correlation coefficient, calculated from the scores in a sample of two variables (Yu & Hutson, 2024). This coefficient is also known as the sample correlation coefficient, and through this test, it is possible to determine the degree of correlation of the association of two variables (Anderson et al., 2012). The Pearson correlation coefficient can range from −1.00 to +1.0, where −1.00 indicates a perfect negative correlation, and +1.00 is a perfect positive correlation. The sign indicates the direction of the correlation, which can be positive or negative, and the number indicates its magnitude. (Yu & Hutson, 2024)

Table 6 shows all the correlations between the three variables considered in the study. If s or P (significance value) is less than 0.05, the coefficient is said to be significant at the 0.05 level (95% confidence level); if it is less than 0.01, the coefficient is significant at the 0.01 level (99% confidence level). (Johnson, 1999).

Table 6. Pearson correlation matrix

		CEXP	AUT	MTP
Culture of experimentation	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	41		
Autonomy	Pearson Correlation	.519**	1	
	Sig. (2-tailed)	.001		
	N	41	41	
Massive transformative purpose	Pearson Correlation	.520**	.804**	1
	Sig. (2-tailed)	.000	.000	
	N	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Own elaboration.

Based on the correlation results in Table 6, whose correlation coefficients range from -1 to +1, the relationships proposed in the research hypotheses are described below:

1. To respond to the first hypothesis that attempts to determine if there is a relationship between the culture of experimentation and autonomy, based on the previously exposed parameters and the results of the correlation (.519), it is a moderate positive correlation. That is to say, the greater the level of culture of experimentation, the greater the level of autonomy. It is also a significant correlation given its value of .001, less than 0.05. That is, it is considered a 95% confidence level that the correlation is actual and a 5% error probability.

It should be noted that although it is not part of this study's hypotheses to assess the relationship between MTP and autonomy since their relationship is assumed from the literature consulted and the ExO model proposed by Ismail et al. (2014), this presents the strongest degree of correlation (.804) in the proposed model.

Moderation Analysis

A moderation analysis was conducted to answer the second hypothesis proposed in this research and to measure the degree of moderation of the MTP variable (moderator variable) to adjust the relationship between independent and dependent variables. This multivariate analysis is carried out when an independent variable predicts a dependent variable, taking into consideration the causal force of a third variable, called the moderator variable, which interacts between both (Kenny, 2015); along this line, the moderating variable affects the strength and direction in the relationship between the predictor variable and the output variable (Fairchild & MacKinnon, 2009).

The technique used to analyze the moderation effects, considering that the variables are quantitative, was the hierarchical regression analysis through a conventional multiple regression analysis. In this analysis, an independent variable, the moderating variable, and a third variable constructed by combining both values are considered, basically the interaction effect. The linear regression test, its ANOVA models, and model coefficients are presented below.

Multiple Regression Model for Autonomy

Table 7 presents the results of the multiple regression model using autonomy as the dependent variable, culture of experimentation as the independent variable, massive transformation purpose (MTP) as the moderating variable, and to determine the interaction effect. This variable is the product of a culture of experimentation and MTP.

Table 7. Multiple regression model of autonomy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.813[a]	.661	.633	2.173	1.993

a. Predictors: (Constant), Culture of Experimentation x Massive Transformative Purpose, Zscore: Culture of Experimentation, Zscore: Massive Transformative Purpose
b. Dependent Variable: Autonomy

Source: Own elaboration.

As seen in the model, the R-value indicates a considerable correlation of .813 independent variables on autonomy. Also, the coefficient of determination R2=.661 indicates that the independent variables explain 66.1% of the autonomy. Furthermore, the Durbin-Watson 1993 statistic indicates no interdependence between the variables' residuals. (Table 8)

Table 8. Anova of the autonomy regression model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	340.284	3	113.428	24.018	.000[b]
	Residual	174.740	37	4.723		
	Total	515.024	40			

a. Dependent Variable: Autonomy
b. Predictors: (Constant), Culture of Experimentation x Massive Transformative Purpose, Zscore: Culture of Experimentation, Zscore: Massive Transformative Purpose

Source: Own elaboration.

Regarding the ANOVA analysis, the model is significant because the F statistic (24.018) has a significance value of .000, less than 0.05, meaning that the resulting information can be generalized to the study population.

Table 9. Regression analysis coefficient of autonomy

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	14.729	.382		38.550	.000		
	Zscore: Culture of Experimentation	.499	.403	.139	1.239	.223	.728	1.373
	Zscore: Massive Transformative Purpose	2.652	.412	.739	6.441	.000	.696	1.436
	Culture of Experimentation x Massive	.101	.346	.029	.293	.771	.930	1.075

Transformative Purpose	

a. Dependent Variable: Autonomy

Source: Own elaboration.

As for the coefficients, results indicate that the variables culture of experimentation and culture of experimentation x MTP are unrelated to autonomy since their significance is more significant than 0.05. The variable that contributes the most to the autonomy model is MTP, with a beta value of .739. Likewise, given the value in the t statistic = 6.441 and a significance level of .000, less than 0.05, the result is significant, and the econometric model is valid. (Table 9)

Concerning moderation, the results indicate that the levels of a culture of experimentation combined with the levels of MTP provide the model with a beta value (0.29) in the t statistic = .293 and a significance level of 771 greater than 0.05, which indicates that the result is not significant. In other words, there is no interaction between the culture of experimentation and the MTP, and the related set of both does not generate a change in the levels of autonomy, rejecting hypothesis 2 of this study.

CONCLUSIONS

To have a deeper understanding of the conclusions presented here, it is crucial to highlight that the concept of exponential organizations, and consequently the ExO model and its attributes, and how these can be combined to impact the generation of innovation within a company, is still in an early stage and requires a theoretical foundation. As pointed out by Mohout and Kiemen (2018), it is not easy to connect the literature on exponential organizations with the literature on organizational strategy, and it is a fact that the concept of ExOs has been overlooked by the academic literature (Marchese et al., 2022). Furthermore, the authors of the exponential organization themselves argue that its main objective is not to generate theory but to offer a guide on creating and maintaining an exponential organization for companies that seek competitiveness in today's fast-paced and changing environments (Ismail et al., 2014).

It is important to emphasize that this is the first approach to the phenomenon of ExOs and the culture of experimentation in Mexico. As an exploratory study, the purpose was never to make a diagnosis but rather to recover these variables and measure whether adequate conditions exist for implementing these innovative business management strategies.

Based on the results, it is possible to realize the proximity that exists in medium and large IT companies in Jalisco to operate under this innovation approach, where the conditions and

practices related to building a culture of experimentation already exist, where team autonomy is promoted and where employees are motivated by a philosophy similar to a massive transformative purpose. It should also be noted that few organizations in Mexico operate under the ExO model and are driven by a strong MTP. Therefore, several assumptions were considered solely to determine how close or far they are from the phenomenon or their potential to operate under this philosophy.

Once this has been clarified and based on the theory compiled for this research, where it is argued that autonomy is a crucial characteristic in exponential organizations and described as self-organizing multidisciplinary teams that operate with decentralized authority (Ismail et al., 2014) to the attributes described by Thomke (2020) about democratizing experimentation in organizations by giving teams the autonomy they need to try new approaches that can add value and facilitate experimentation; and according to the result of the Pearson correlations (r) to test the association between variables, it was found that the factors culture of experimentation and autonomy present a positive and significant relationship. From the above, it can be concluded that the higher the culture of experimentation within the organization, the greater the levels of autonomy will be, which allows the validation of hypothesis 1 presented in this study.

As for the second objective of this research, taking into consideration that the MTP is the backbone of exponential organizations, differentiating itself from the company's mission by aiming to capture the hearts, minds, imagination, and ambitions of those inside and outside the organization (Ismail et al., 2014); to the *Purpose Launchpad* framework proposed by Palao (2022), which suggests that the purpose should serve as a north star to direct the organization's initiatives, where it not only solves a problem or need in the market but also has a positive impact on the world; and the statistical tests carried out, first through a correlation and subsequently through a linear regression, which allowed us to determine the degree of moderation of the variable MTP (moderator variable) to adjust the relationship between culture of experimentation and autonomy through the F and t statistics, the results showed that there are no significant relationships.

This allows us to conclude that there is no interaction between the culture of experimentation and the MTP, and the related set of both does not generate a change in the levels of autonomy, rejecting hypothesis 2 of this research. A possible explanation for these results could be the lack of clarity about the concept of the MTP in the organizations studied; it is a relatively new concept and is strongly linked to the concept of exponential organizations rather than to the culture of experimentation, where no reference is made to this concept or to the importance for the organization of transcending and having a positive impact in the world.

It is also important to note that it is not possible to generalize the conclusions presented here to the entire population since the size of the sample to which we had access (41 individuals) was a convenience sample and does not cover the total number of large and medium-sized companies published in the DENUE database. Furthermore, as described in the methodology section of this research and because the surveys were applied during the COVID-19 pandemic, it was necessary to include other companies not considered in the original database to conclude the study within the defined times so a certain degree of bias in the results is assumed.

Another limitation from the statistical point of view is that, given the exploratory nature of this study, the assumptions of normality, linearity, independence of the error terms, and equality of variances were assumed (Hair et al., 1999) necessary for the use of parametric tests and the application of multiple linear regression. Therefore, greater statistical rigor in the data is recommended, such as the verification of the assumptions of the multivariate analysis involved in the process of estimation and interpretation of results, which will allow a more precise forecast of the results in some variables based on others, as well as better-fitting mathematical expressions.

It is worth mentioning that the results presented here are taken as preliminary, recommending explanatory and descriptive studies to deeply understand the critical factors involved in a culture of experimentation model. It is also recommended for future research to consider other factors of the ExO model, such as *algorithms, engagement, interfaces, dashboards, and social tools,* to determine to what extent they are related to a culture of experimentation when moderated by the MTP.

Furthermore, the information presented in this research contributes to expanding knowledge about the culture of experimentation, exponential organizations, and the factors involved in both phenomena, as well as to generating new lines of research since there is little published information (both theoretical and empirical) on these concepts due to their recent emergence. In addition, this research is precious for any organization. Its leaders seek to successfully implement or reinforce the culture of experimentation because it is not limited solely and exclusively to tech companies or organizations. However, one of the purposes of testing this empirical model is that it can be implemented by any organization, regardless of the industry and its size.

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FINANCIAL AND ECONOMIC INDICATORS

Financing Decisions: An Approach for the 21st Century

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Businesses are the essential engine of development in a nation's economy. By improving their profitability and competitiveness, they reduce the risk of failure and boost GDP growth and job creation. This, in turn, encourages investment and promotes a more equitable income distribution, contributing to society's general well-being (Romero, 2013).

Organizations require financial resources to support their investments in tangible and intangible assets, such as facilities, machinery, research, and critical personnel for operation and management. These resources come from capital contributions by shareholders, reinvestment of profits, or the contracting of external debt. Research on capital or debt decisions must consider multiple factors, such as the risk of failure, growth opportunities, and equitable financial performance with the capital provided or the financing used (Cassar, 2004).

Financing strategies, a key factor of competitiveness, have strongly influenced corporate financial performance and national economic development. It is crucial to thoroughly investigate the variables and their impact when contracting debt to incorporate the appropriate amounts into companies' overall strategy, thus improving their competitiveness.

In the business world, whether there is an optimal capital structure and how it should be constructed is one of the most debated topics in the financial literature. Since Modigliani and Miller's influential 1958 paper introduced the idea of the irrelevance of capital structure to the firm's value, three main theories have emerged. These theories, which dominate the theoretical and empirical discussion, seek to test the assumptions and variables underpinning an optimal corporate and global capital structure.

Multiple theories and research have analyzed the corporate financial structure, yielding diverse results and without achieving a consensus on a single explanation of financing

decisions. This is why it is necessary to deepen the research to understand which variables influence the choice between debt and equity and which theories best explain this decision (Hernández & Ríos, 2012).

Organizations must establish clear policies and procedures to ensure the necessary resources to finance their tangible and intangible investments, with financial debt being one of the primary sources of external financing (Denis & Mihov, 2003). However, few empirical studies examine the impact of the internal variables of the business and external variables of the national environment on the contracting and incorporation of debt and their effect on the capital structure (WACC), which is crucial for decision-making oriented toward achieving an optimal capital structure.

Understanding the impact of the determinants of incorporating financial debt into the capital structure is essential to establish guidelines that guide the appropriate financing sources. These guidelines should align with the company's overall strategy and lead to an optimal capital structure. This issue is crucial, as financial policy and capital structure are critical aspects of economic policy. In addition, it has been observed that business failure, especially in small firms, is strongly linked to financial leverage (Ang, 1991; Berger & Udell, 1998).

The optimal capital structure: This is achieved when the increase in insolvency and agency costs perfectly balances the marginal fiscal savings from debt. Maximizing the company's value requires minimizing the weighted average cost of capital as long as the cash flow is not affected by increased leverage. A favorable leverage effect is essential to improve the profitability and value of the company; otherwise, negative leverage would reduce both indicators.

Static Trade-Off Theory

Kraus and Litzenberg's theory of static equilibrium holds that the optimal capital structure is reached when the balance between the costs of financial distress and the tax benefits of debt is ideal. This structure sits at the point where any additional debt would cause the insolvency costs to outweigh the tax benefits. When deciding on the level of financial leverage, companies must evaluate factors such as business risk, financial hardship costs, shareholder and management risk aversion, and internal variables such as total assets, tangible assets, equity, sales, and operating profits. In addition, external variables such as the tax rate, inflation, exchange parity, and interest rates must be considered.

The optimal capital structure maximizes the company's market value by effectively managing the factors influencing financial leverage. The goal is to maintain this structure as long as conditions remain stable. Since the seminal work of Modigliani and Miller, capital structure theory has been central to financial research, focused on finding the optimal structure (Shyam-Sunder & Myers, 1998).

When combined with taxes, financial hardship costs, agency costs, and asymmetric information, Modigliani and Miller's theory shows that the increase in financial leverage reaches a point where its adverse effects balance the benefits. This point, the optimal capital structure, is where the company's value is maximized.

Bradley, Harrel, and Kim (1984) showed that the optimal capital structure depends on the balance between the tax benefits of debt and the costs associated with leverage. They concluded that this structure reflects the influence of various economic costs derived from corporate indebtedness.

Financial leverage decisions must balance the tax benefits of interest with the costs associated with economic hardship, agency costs, and information asymmetry. The objective is to optimize leverage to maximize the company's value and minimize the weighted average cost of capital (Vargas, 2011).

Theoretical and empirical discussions on capital structure have sought to validate the assumptions and variables that explain the combination of resources in business financing policy. These discussions are based on the three main theories mentioned below:

1. Modigliani and Miller: Position I and Position II
2. Trade-Off Theory
3. Peckin Order Theory

1. Analysis of the Theoretical Postulates of Modigliani and Miller (M&M)

In recent decades, several theoretical models have sought to validate and generalize the theses of irrelevance and maximum indebtedness proposed by M&M in 1958 and 1963, respectively. The convergence of these investigations has given rise to a renewed theory of capital structure that postulates the existence of an optimal structure.

1.1 Proposition I, Modigliani and Miller, 1958 (Irrelevance Thesis, without taxes)

Modigliani and Miller argued that, under certain assumptions, a company's value and weighted average cost of capital are independent of its financial structure, concluding that debt does not add value in the absence of taxes. Its assumptions include a perfect capital market, no transaction costs and bankruptcy, and symmetry in information. In this scenario, debt and equity are irrelevant, and internal and external funds are interchangeable. However, this irrelevance needs to reflect the capital structures observed in practice.

1.2 Proposition II, Modigliani and Miller, 1963 (Maximum Indebtedness Thesis, with taxes)

In 1963, M&Ms revised their initial theory to include taxes, proposing that the tax deductibility of interest causes the value of a company to increase with the use of debt, peaking when it is financed almost exclusively by it. However, subsequent studies showed that this benefit is limited, as companies have other avenues of tax savings. Over time, M&M's assumptions were adjusted, giving rise to alternative theories incorporating factors such as agency costs and information asymmetry. The existence of taxes and bankruptcy costs justifies the relevance of the debt. Theories such as those of De Angelo and Masulis (1980), Myers (1984), and Ross (2014) highlight the importance of information asymmetry in the financial structure. In addition, Jensen and Meckling's (1976) agency cost theory addresses conflicts between managers, shareholders, and creditors, which can generate agency costs that decrease the firm's value.

2. Trade-Off Theory

Trade-off theory is positioned as an intermediate approach between M&M's theses, recognizing the market's imperfections and accepting the existence of an optimal capital structure. Bradley, Jarrel, and Kim (1984) argued that corporations set a target level of debt to take advantage of tax benefits while avoiding the limitations of issuing new capital. According to this theory, an optimal combination of debt and equity maximizes the company's value by balancing the benefits and costs of debt. However, it must explain why some financially sound firms do not use their borrowing capacity or why borrowing remains high in low-tax countries.

3. Pecking Order Theory (Hierarchy of Preferences)

The Hierarchy of Preferences (TPO) Theory, formally proposed by Myers (1984) and Myers and Majluf (1984) and based on the work of Donaldson (1961), as well as Agency Cost Theory and Free Cash Flow Theory, suggests that firms prioritize the use of internal funds generated by profits. Followed by debt and, finally, the issuance of external capital. This hierarchy is due to asymmetric information and lower domestic financing and debt costs than equity issuance. This theory prioritizes self-financing, suggesting that the most profitable companies tend to self-finance by generating higher profits and reducing their dependence on external financing through debt (Lemmon & Zender, 2010). Thus, this theory establishes a negative relationship between the debt level and organizations' operating profitability (Tudose, 2012).

It has been 66 years since the seminal work of Modigliani and Miller (1958) laid the foundations of modern corporate finance. Since then, capital structure has been a central topic in finance and economics. However, research has not offered conclusive answers about the capital structure theory. Understanding the theoretical postulates and the impact of debt on the capital structure is crucial to informing debt policies, strengthening financial strategies, and making informed decisions that ensure competitive advantages and solid economic performance.

Market timing and stakeholder theories have recently emerged, bringing new perspectives to studying capital structure. Despite the advances, a model that considers all the determinants of the capital structure has yet to be developed. Recent evidence indicates that macroeconomic and institutional factors in each country are crucial in addition to company-specific factors. Researchers such as Booth et al. (2001), Antoniou et al. (2008), and Gaytán and Bonales (2009) highlight the significant influence of the economic environment and institutional mechanisms on capital structure. Arias et al. (2009) underline the importance of investigating the determinants of WACC in companies from different sectors and countries, especially in Mexico, to design appropriate financial instruments and improve financing decisions.

Economic and financial indicators are useful tools that benefit organizations by facilitating timely and appropriate decision-making about their corporate and financial strategies.

Next, the evolution of some economic and financial indicators of the Mexican environment is described and shown to facilitate decision-making related to personal and business strategies in an integral manner.

1. National Consumer Price Index (INPC, Spanish)
2. The Price and Quotation Index of the Mexican Stock Exchange (IPC, Spanish)
3. Exchange rate
4. Equilibrium interbank interest rate (TIIE, Spanish)
5. CETES rate of return
6. Investment units (UDIS, Spanish)

1. NATIONAL CONSUMER PRICE INDEX (INPC)

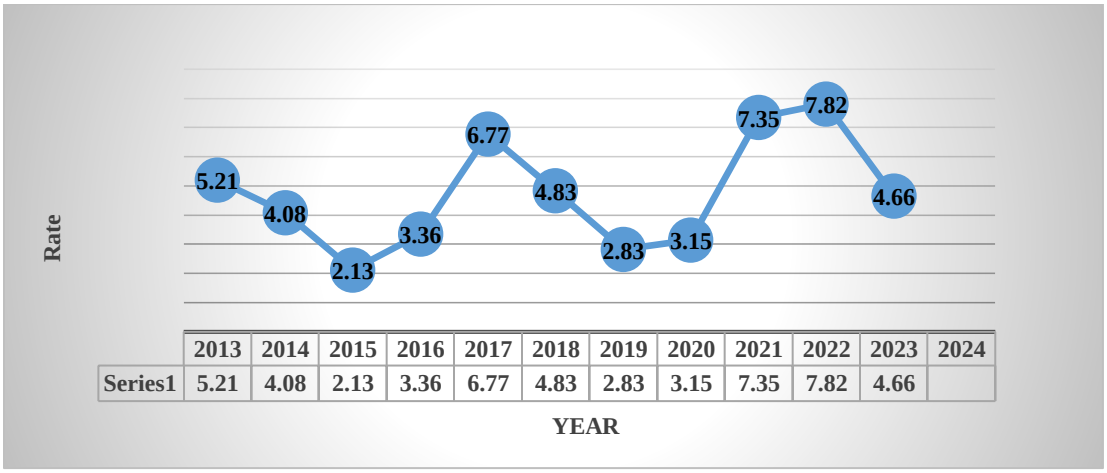
Born in 1995 and reflecting changes in consumer prices, it measures the general price increase in the country. The Bank of Mexico and INEGI calculate it fortnightly (2021). INPC is published in the Official Gazette of the Federation on the 10th and 25th of each month. The reference period is the second half of July 2018.

Table 1
Accumulated inflation in the year (Base: 2nd. half of July 2018=100 with data provided by *Banco de México*)

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	0.79	0.90	-0.09	0.38	1.70	0.53	0.09	0.48	0.86	0.59	0.76	0.89
February	1.46	1.15	0.09	0.82	2.29	0.91	0.06	0.90	1.50	1.43	1.24	0.99
March	1.99	1.43	0.51	0.97	2.92	1.24	0.44	0.85	2.34	2.43	1.51	1.28
April	1.81	1.24	0.25	0.65	3.04	0.90	0.50	-0.17	2.67	2.98	1.49	1.48
May	0.95	0.91	-0.26	0.20	2.92	0.73	0.21	0.22	2.88	3.17	1.27	1.29
June	1.12	1.09	-0.09	0.31	3.18	1.12	0.27	0.76	3.43	4.04	1.37	1.68
July	1.14	1.42	0.06	0.57	3.57	1.66	0.65	1.43	4.04	4.81	1.86	2.74
August	1.31	1.73	0.27	0.86	4.08	2.26	0.63	1.82	4.24	5.54	2.42	
September	1.61	2.18	0.27	1.47	4.41	2.69	0.89	2.06	4.88	6.19	2.88	
October	2.77	2.74	1.16	2.09	5.06	3.22	1.44	2.68	5.76	6.79	3.27	
November	4.57	3.57	1.71	2.89	6.15	4.10	2.26	2.76	6.97	7.41	3.93	
December	5.21	4.08	2.13	3.36	6.77	4.83	2.83	3.15	7.35	7.82	4.66	

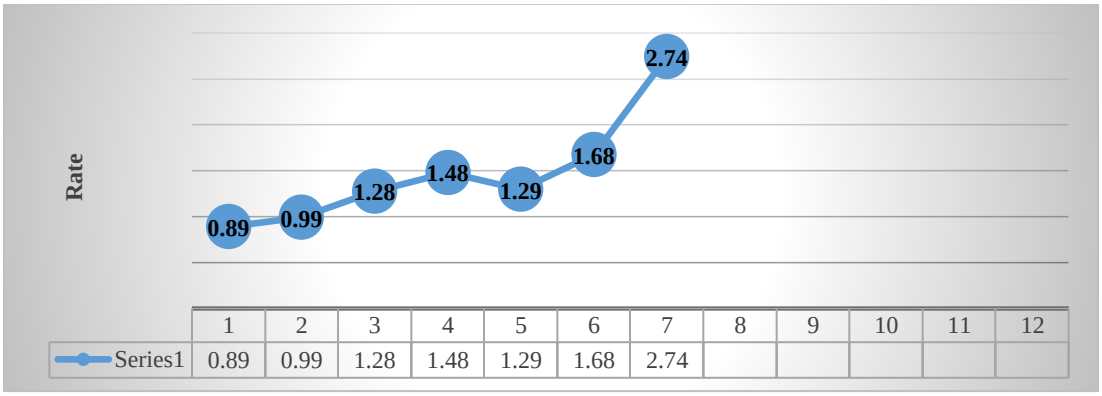
Source: Own elaboration (INEGI, 2024). Route: Indicadores económicos de coyuntura > Índices de precios > Índice nacional de precios al consumidor. Base segunda quincena de julio de 2018=100 > Mensual > Índice > Índice general

Graph 1
Inflation in Mexico (2013-2023 accumulated at the end of the year)



Source: Own elaboration (INEGI, 2024). Route: Indicadores económicos de coyuntura > Índices de precios > Índice nacional de precios al consumidor. Base segunda quincena de julio de 2018=100 > Mensual > Índice > Índice general

Graph 2
Inflation in Mexico (accumulated January-July 2024)



Source: Own elaboration (INEGI, 2024). Route: Indicadores económicos de coyuntura > Índices de precios > Índice nacional de precios al consumidor. Base segunda quincena de julio de 2018=100 > Mensual > Índice > Índice general

2. THE PRICE AND QUOTATION INDEX OF THE MEXICAN STOCK EXCHANGE (IPC)

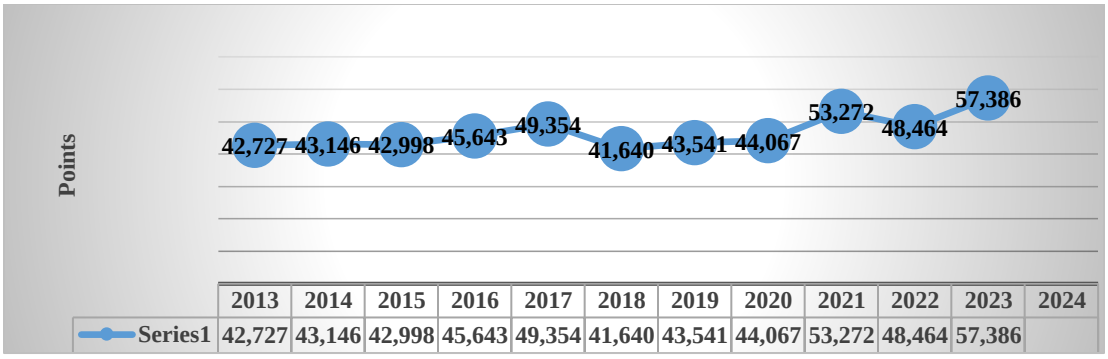
Represents the change in the values traded on the Mexican Stock Exchange concerning the previous day to determine the percentage of rising or falling of the most representative shares of the companies listed therein.

Table 2
The Price and Quotation Index of the Mexican Stock Exchange
(Base: October 1978, 0.78=100)

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	45,278	40,879	40,951	43,631	47,001	50,456	43,988	44,862	42,986	51,331	54,564	57,373
February	44,121	38,783	44,190	43,715	46,857	47,438	42,824	41,324	44,593	53,401	52,758	55,414
March	44,077	40,462	43,725	45,881	48,542	46,125	43,281	34,554	47,246	56,537	53,904	57,369
April	42,263	40,712	44,582	45,785	49,261	48,354	44,597	36,470	48,010	51,418	55,121	56,728
May	41,588	41,363	44,704	45,459	48,788	44,663	42,749	36,122	50,886	51,753	52,736	55,179
June	40,623	42,737	45,054	45,966	49,857	47,663	43,161	37,716	50,290	47,524	53,526	52,440
July	40,838	43,818	44,753	46,661	51,012	49,698	40,863	37,020	50,868	48,144	54,819	53,094
August	39,492	45,628	43,722	47,541	51,210	49,548	42,623	36,841	53,305	44,919	53,021	51,986
September	40,185	44,986	42,633	47,246	50,346	49,504	43,011	37,459	51,386	44,627	50,875	
October	41,039	45,028	44,543	48,009	48,626	43,943	43,337	36,988	51,310	49,922	49,062	
November	42,499	44,190	43,419	45,286	47,092	41,733	42,820	41,779	49,699	51,685	54,060	
December	42,727	43,146	42,998	45,643	49,354	41,640	43,541	44,067	53,272	48,464	57,386	

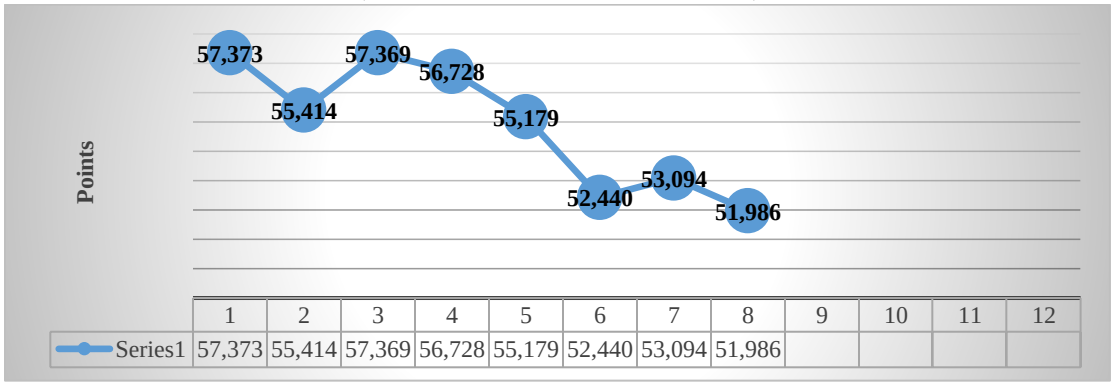
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=7&accion=consultarCuadro&idCuadro=CF57&locale=es

Graph 3
The Price and Quotation Index of the Mexican Stock Exchange, 2013 - 2023
(Score at the end of each year)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=7&accion=consultarCuadro&idCuadro=CF57&locale=es

Graph 4
The Price and Quotation Index of the Mexican Stock Exchange, January-August 2024
(Score at the end of each month)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=7&accion=consultarCuadro&idCuadro=CF57&locale=es

3. EXCHANGE RATE

It is the value of the Mexican peso relative to the dollar calculated using the daily average of the five most important banks in the country. It reflects the spot price (cash) negotiated between banks. It is highly related to Inflation, the interest rate, and the Mexican Stock Exchange.

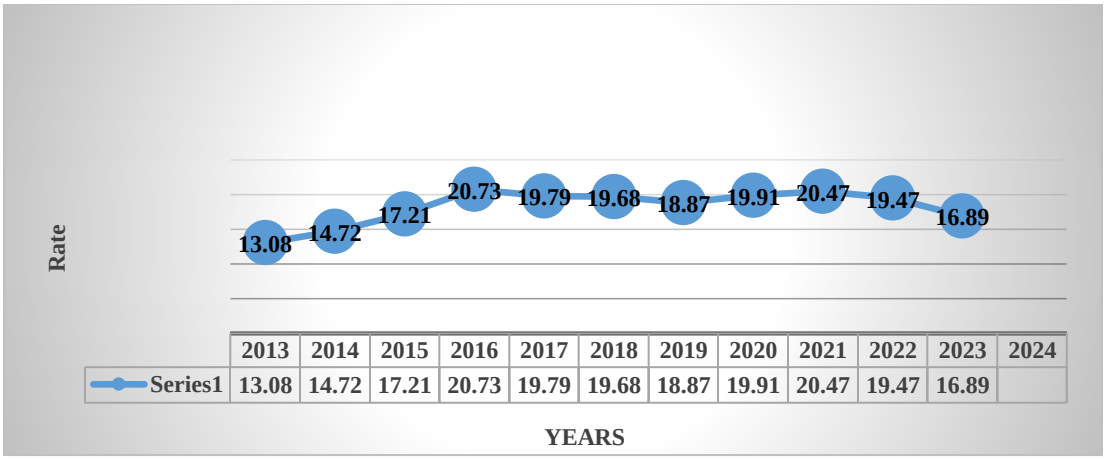
Table 3
Exchange rate (National currency per US dollar, parity at the end of each period)

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	12.71	13.37	14.69	18.45	21.02	18.62	19.04	18.91	20.22	20.74	18.79	17.16
February	12.87	13.30	14.92	18.17	19.83	18.65	19.26	19.78	20.94	20.65	18.40	17.06
March	12.36	13.08	15.15	17.40	18.81	18.33	19.38	23.48	20.44	19.99	18.11	16.53
April	12.16	13.14	15.22	19.40	19.11	18.86	19.01	23.93	20.18	20.57	18.07	17.09
May	12.63	12.87	15.36	18.45	18.51	19.75	19.64	22.18	19.92	19.69	17.56	17.01
June	13.19	13.03	15.57	18.91	17.90	20.06	19.21	23.09	19.91	20.13	17.07	18.24
July	12.73	13.06	16.21	18.86	17.69	18.55	19.99	22.20	19.85	20.34	16.73	18.59
August	13.25	13.08	16.89	18.58	17.88	19.07	20.07	21.89	20.06	20.09	16.84	19.60
September	13.01	13.45	17.01	19.50	18.13	18.90	19.68	22.14	20.56	20.09	17.62	
October	12.89	13.42	16.45	18.84	19.15	19.80	19.16	21.25	20.53	19.82	18.08	
November	13.09	13.72	16.55	20.55	18.58	20.41	19.61	20.14	21.45	19.40	17.14	
December	13.08	14.72	17.21	20.73	19.79	19.68	18.87	19.91	20.47	19.47	16.89	

NOTE: Exchange rate FIX by The Banco de México is used to settle obligations denominated in foreign currency. Quote at the end

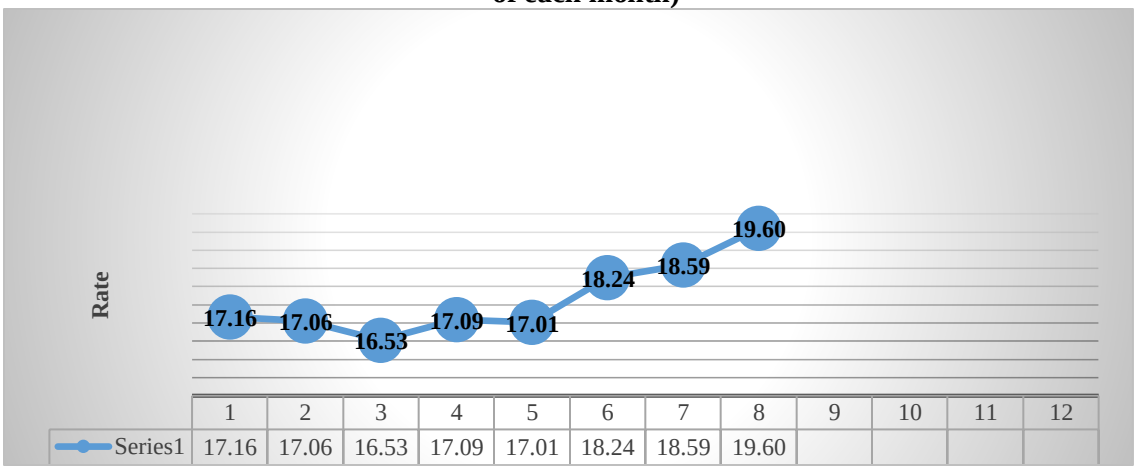
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=6&accion=consultarCuadro&idCuadro=CF102&locale=es

Graph 5
Exchange rate (National currency per US dollar, 2013-2024,
(FIX parity at the end of each year)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=6&accion=consultarCuadro&idCuadro=CF102&locale=es

Graph 6
Exchange rate (National currency per US dollar, January-August 2024, FIX parity at the end of each month)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=6&accion=consultarCuadro&idCuadro=CF102&locale=es

4. EQUILIBRIUM INTERBANK INTEREST RATE (TIIE)

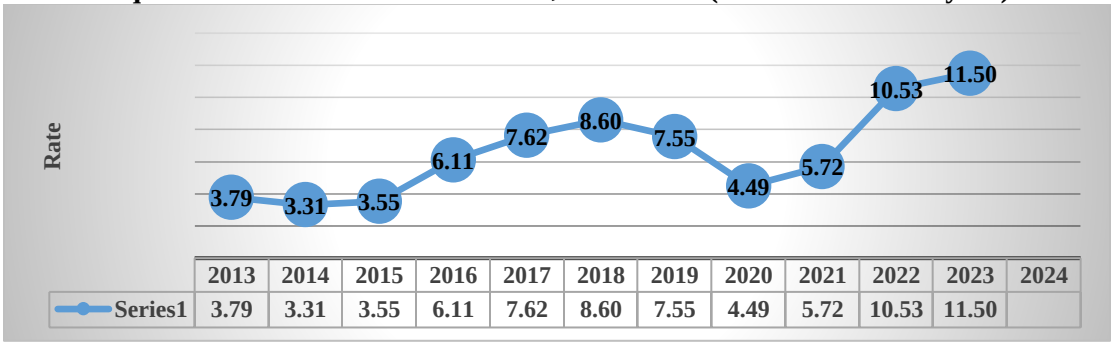
On March 23, 1995, the Bank of Mexico, to establish an interbank interest rate that better reflects market conditions, released the Interbank Equilibrium Interest Rate through the Official Gazette of the Federation.

Table 4
Equilibrium interbank interest rate (28-day quote)

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	4.84	3.78	3.29	3.56	6.15	7.66	8.59	7.50	4.47	5.72	10.82	11.50
February	4.80	3.79	3.29	4.05	6.61	7.83	8.54	7.29	4.36	6.02	11.27	11.50
March	4.35	3.81	3.30	4.07	6.68	7.85	8.51	6.74	4.28	6.33	11.43	11.44
April	4.33	3.80	3.30	4.07	6.89	7.85	8.50	6.25	4.28	6.73	11.54	11.25
May	4.30	3.79	3.30	4.10	7.15	7.86	8.51	5.74	4.29	7.01	11.51	11.24
June	4.31	3.31	3.30	4.11	7.36	8.10	8.49	5.28	4.32	7.42	11.49	11.24
July	4.32	3.31	3.31	4.59	7.38	8.11	8.47	5.19	4.52	8.04	11.51	11.25
August	4.30	3.30	3.33	4.60	7.38	8.10	8.26	4.76	4.65	8.50	11.51	11.08
September	4.03	3.29	3.33	4.67	7.38	8.12	8.04	4.55	4.75	8.89	11.50	
October	3.78	3.28	3.30	5.11	7.38	8.15	7.97	4.51	4.98	9.56	11.50	
November	3.80	3.31	3.32	5.57	7.39	8.34	7.78	4.48	5.13	10.00	11.50	
December	3.79	3.31	3.55	6.11	7.62	8.60	7.55	4.49	5.72	10.53	11.50	

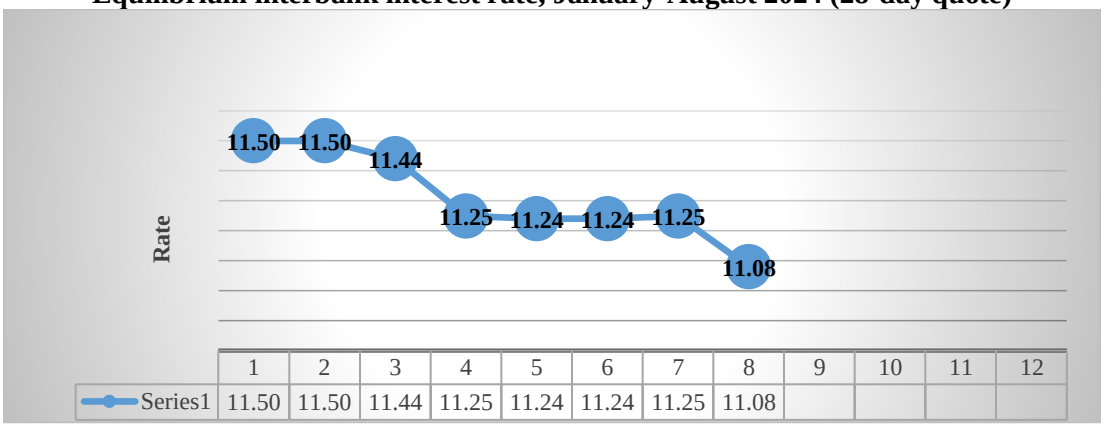
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=18&accion=consultarCuadro&idCuadro=CF101&locale=es

Graph 7
Equilibrium interbank interest rate, 2013- 2023 (at the end of each year)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=18&accion=consultarCuadro&idCuadro=CF101&locale=es

Graph 8
Equilibrium interbank interest rate, January-August 2024 (28-day quote)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=18&accion=consultarCuadro&idCuadro=CF101&locale=es

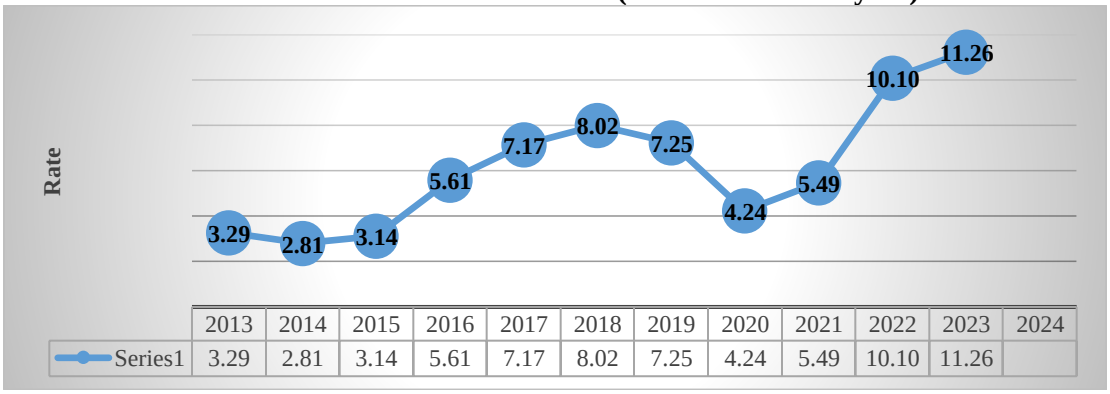
5. CETES RATE OF RETURN

Table 5
CETES rate of return (28-day)

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	4.15	3.14	2.67	3.08	5.83	7.25	7.95	7.04	4.22	5.50	10.80	11.28
February	4.19	3.16	2.81	3.36	6.06	7.40	7.93	6.91	4.02	5.94	11.04	11.00
March	3.98	3.17	3.04	3.80	6.32	7.47	8.02	6.59	4.08	6.52	11.34	10.90
April	3.82	3.23	2.97	3.74	6.50	7.46	7.78	5.84	4.06	6.68	11.27	11.04
May	3.72	3.28	2.98	3.81	6.56	7.51	8.07	5.38	4.07	6.90	11.25	11.03
June	3.78	3.02	2.96	3.81	6.82	7.64	8.18	4.85	4.03	7.56	11.02	10.88
July	3.85	2.83	2.99	4.21	6.99	7.73	8.15	4.63	4.35	8.05	11.09	10.87
August	3.84	2.77	3.04	4.24	6.94	7.73	7.87	4.50	4.49	8.35	11.07	10.65
September	3.64	2.83	3.10	4.28	6.99	7.69	7.61	4.25	4.69	9.25	11.05	
October	3.39	2.90	3.02	4.69	7.03	7.69	7.62	4.22	4.93	9.00	11.26	
November	3.39	2.85	3.02	5.15	7.02	7.83	7.46	4.28	5.05	9.70	11.78	
December	3.29	2.81	3.14	5.61	7.17	8.02	7.25	4.24	5.49	10.10	11.26	

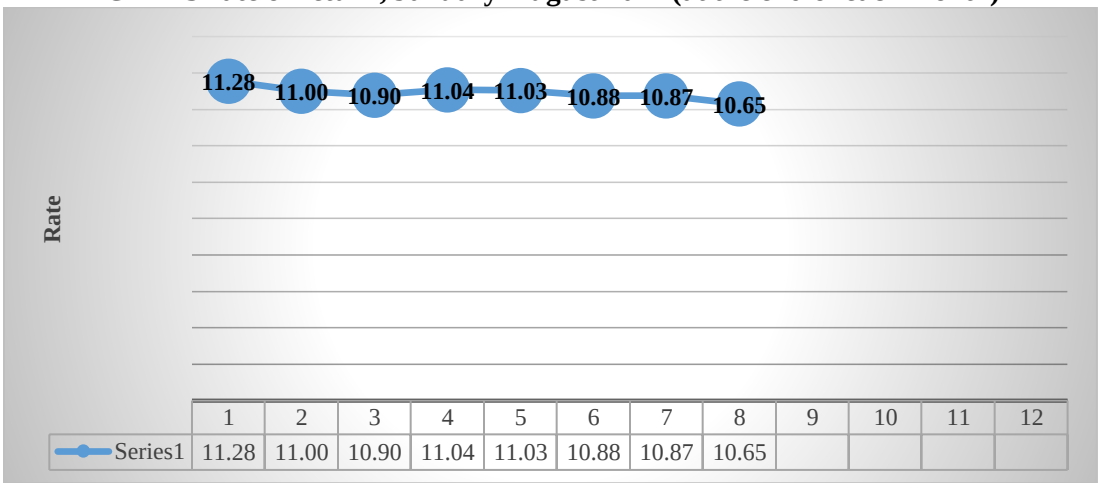
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=22&accion=consultarCuadro&idCuadro=CF107&locale=es

Graph 9
CETES rate of return 2013- 2023 (at the end of each year)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=22&accion=consultarCuadro&idCuadro=CF107&locale=es

Graph 10
CETES rate of return, January-August 2024 (at the end of each month)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=22&accion=consultarCuadro&idCuadro=CF107&locale=es

6. INVESTMENT UNITS (UDIS)

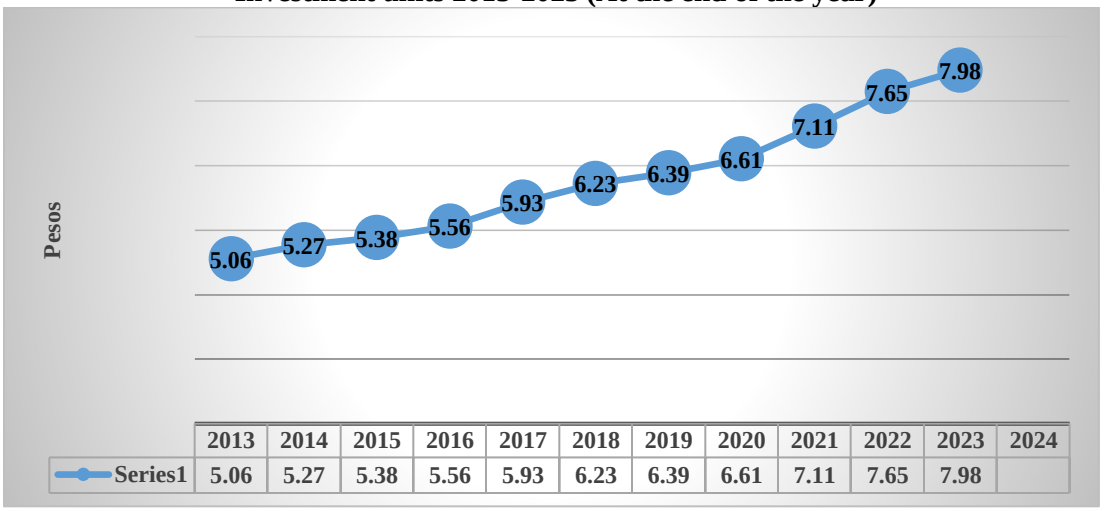
The UDI is a unit of account of constant real value to denominate credit titles. It does not apply to checks, commercial contracts, or other acts of commerce.

Table 6
Investment units (value concerning pesos)

Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	4.89	5.10	5.29	5.41	5.62	5.97	6.25	6.44	6.64	7.12	7.69	8.06
February	4.92	5.13	5.29	5.43	5.69	6.00	6.25	6.46	6.70	7.18	7.74	8.11
March	4.94	5.15	5.30	5.44	5.71	6.02	6.26	6.49	6.75	7.24	7.77	8.11
April	4.97	5.15	5.32	5.45	5.75	6.03	6.28	6.43	6.79	7.31	7.78	8.13
May	4.96	5.13	5.29	5.42	5.75	6.01	6.27	6.42	6.81	7.33	7.78	8.15
June	4.95	5.13	5.28	5.42	5.75	6.01	6.26	6.44	6.83	7.36	7.77	8.13
July	4.95	5.14	5.28	5.42	5.76	6.04	6.27	6.49	6.87	7.43	7.79	8.20
August	4.95	5.16	5.29	5.44	5.79	6.07	6.29	6.52	6.90	7.47	7.83	8.25
Sep.	4.97	5.18	5.31	5.45	5.82	6.11	6.29	6.55	6.92	7.53	7.87	
Oct.	4.99	5.20	5.33	5.49	5.84	6.13	6.31	6.57	6.97	7.57	7.90	
Nov.	5.02	5.23	5.36	5.53	5.89	6.17	6.35	6.60	7.04	7.62	7.94	
Dec.	5.06	5.27	5.38	5.56	5.93	6.23	6.39	6.61	7.11	7.65	7.98	

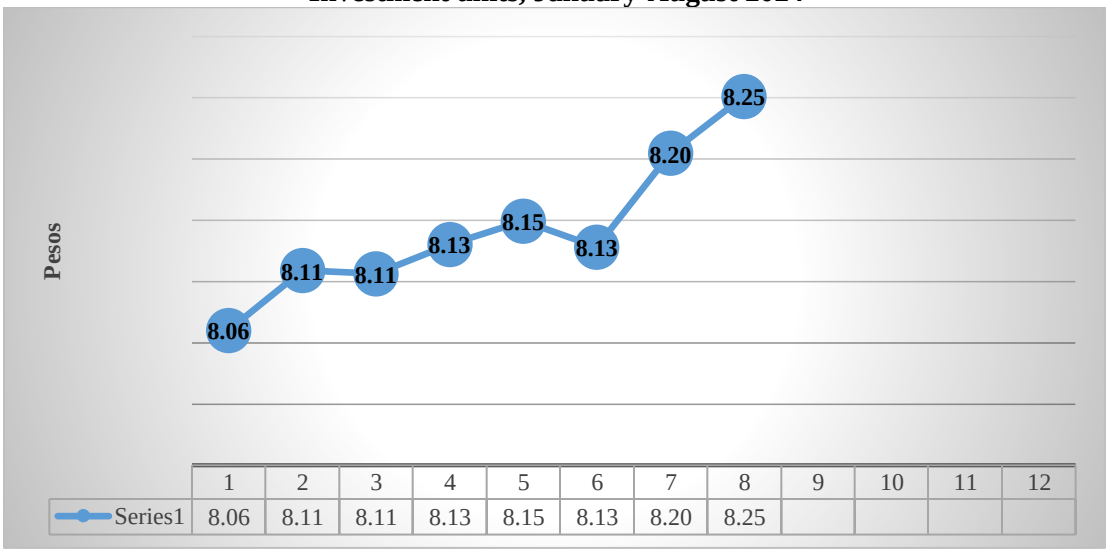
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CP150&locale=es

Graph 11
Investment units 2013-2023 (At the end of the year)



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CP150&locale=es

Graph 12
Investment units, January-August 2024



Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CP150&locale=es

En conclusión, las decisiones de financiamiento son cruciales para el desarrollo empresarial y económico de un país. A pesar de los avances teóricos desde Modigliani y Miller, aún no existe un consenso sobre la estructura óptima de capital. Es fundamental seguir investigando los factores internos y externos que influyen en estas decisiones para diseñar estrategias de financiamiento más efectivas. La integración de teorías recientes y un enfoque adaptado al

contexto específico de cada país pueden contribuir a mejorar la competitividad y el desempeño financiero de las empresas.

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