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Editor's Letter

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Congratulations to the entire editorial team on joining Scopus. We are sure it is a moment of pride for everyone at *Mercados y Negocios*. We must keep up the excellent work and strive to be the best daily! This issue contains five research articles that have the potential to significantly contribute to their respective fields, thanks to the rigorous peer-review process they have undergone.

Internal Branding Processes in a Fashion Organization: Turning Employees into Brand Ambassadors is the first article, written by Enrique Murillo, Teresa Sádaba, Pedro Mir-Bernal, Antonia Terán-Bustamante, and Oziel López-Sánchez. This article aims to empirically examine the internal branding processes implemented by a global sports fashion firm to turn all employees into competent brand ambassadors. Brand-oriented training was hypothesized as an antecedent of salesperson brand identification and brand commitment, which drive brand-aligned behavior, the critical trait of employee brand ambassadors. The principal conclusion of the authors is that brand-oriented training proves a significant driver of salesperson brand identification. Furthermore, brand identification drives brand commitment and brand-aligned behavior among all company employees, not just salespersons.

Romina Castillo Malagón, María Angélica Cruz Reyes, and Ruth Selene Romero Saldaña wrote the second article. Its title is *Circular Economy: A Technological Innovation Strategy for Sustainability in Air Transport.* The objective was to identify innovations, technological advances, and best practices to migrate towards a circular economy in air transport. The relevance of the research lies in the contribution to the generation of circular economy knowledge in the field of administration with application in the aeronautical industry. By analyzing literature and best practices, the circular economy could be a viable solution to reduce the use of natural resources in aircraft manufacturing and airport operations. Among the main findings are innovations and technological developments in new materials, fuels, building methods, and best practices implemented at airports to obtain energy and generate less waste. It has also been identified that applying circular economy principles in this mode of transport would contribute to sustainability efforts and increase the competitiveness of organizations in the sector.

Artisanal Businesses: Historical and Economic Context is the following article. Its authors are Franci Daniela Alonso Aguilar, Tania Elena González Alvarado, Pablo Cabanelas Lorenzo. The objective was to examine the unique features of artisan enterprises in Ecuador

and how cooperation programs and national peculiarities have influenced their development. Through descriptive and conceptual analysis, we can better understand how these organizations have evolved within the historical and economic context of rural regions in Ecuador. The primary findings suggest that poverty alleviation and control measures have significantly impacted the definition of artisan enterprises in Ecuador, which now closely resemble micro-enterprises. Development cooperation efforts in Ecuador have prioritized preserving artisanal production rather than replacing it with industrial production, promoting micro-enterprises growth as artisanal workshops.

Sara Guerrero-Campos, Jorge Pelayo Maciel, and Jaime Arango-Marin wrote *Adaptability of a Business and Superior Performance: Triad Model of Dynamic Capabilities,* which is the fourth article. The article aims to examine the relationship between business adaptability and superior performance. The researchers used Exploratory Factor Analysis and Kruskal-Wallis statistics to analyze data from a survey of 227 companies associated with a University Center. The study found that the Triad Model of Dynamic Capabilities, which includes Sense, Seize, and Transform components, explained 78.38% of the variance in business adaptability. The findings confirm the importance of Sense, Seize, and Transform capabilities in sustaining competitive advantage, as demonstrated by the observed superior performance of the organizations. The originality of the paper lies in identifying higher-order capabilities associated with business adaptability in organizations across different sectors.

The fifth and last article is *Practical Strategies for The Economic Development of Mexico: Nearshoring Trend*. Its authors are Ignacio Santillán Luna, J. Jesús Ceja Pizano, and Daniel Pineda Domínguez. This work suggests practical strategies for Mexico's economic development through the trend of nearshoring. It involved identifying, analyzing, and organizing the causes of the conflict between China and the USA over international trade and exploring the opportunities that nearshoring to Mexico can offer. Qualitative research methods were applied, and documentary research techniques were used based on two study objects: a) the Sino-American dispute over international trade and b) nearshoring to Mexico. Nearshoring to Mexico is driven by various factors, including tariff benefits from Free Trade Agreements, low labor costs in manufacturing companies, and a stable exchange rate. Therefore, Mexico needs to encourage the development of industrial parks, implement an effective Public Security Policy, offer tax incentives to attract Foreign Direct Investment, and improve port, road, and air infrastructure to take full advantage of this trend.

We extend our heartfelt gratitude to our esteemed authors for their invaluable contributions. We also thank our readers for their continued support and for recommending and citing *Mercados y Negocios*. Last but not least, we appreciate our dedicated editorial team for their unwavering commitment and hard work.

Dr. José Sánchez Gutiérrez
Editor

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Internal Branding Processes in a Fashion Organization: Turning Employees into Brand Ambassadors

Branding interno en una organización de moda: convertir a los empleados en embajadores de la marca

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ABSTRACT

This research aims to empirically examine the internal branding processes implemented by a global sports fashion firm to turn all employees into competent brand ambassadors. Brand-oriented training was hypothesized as an antecedent of salesperson brand identification and brand commitment, which drive brand-aligned behavior, the critical trait of employee brand ambassadors. These hypotheses were tested by surveying 141 corporate and retail employees of a global sportswear fashion brand's regional operations in Mexico. The principal conclusion is that brand-oriented training proves a significant driver of salesperson brand identification. Furthermore, brand identification drives brand commitment and brand-aligned behavior among all company employees, not just salespersons.

Keywords: Internal branding; brand ambassadors; salesperson brand identification; front-line employees; fashion brands; competitiveness.

JEL code: M370, M540.

RESUMEN

Esta investigación tiene como objetivo examinar empíricamente los procesos de branding interno, implementados por una importante firma de moda deportiva para convertir a todos los empleados en embajadores de marca competentes. Se planteó la hipótesis de que la capacitación orientada a la marca es un antecedente de la identificación y el compromiso con la marca por parte del vendedor, lo que impulsa un comportamiento alineado con la marca, el rasgo crítico de los empleados embajadores de la marca. Estas hipótesis se probaron encuestando a 141 empleados corporativos y minoristas de las operaciones regionales de una importante marca de moda deportiva en México. La principal conclusión es que la capacitación orientada a la marca proporciona un impulsor significativo de la identificación de la marca por parte de los vendedores. Además, la identificación de la marca impulsa el compromiso con la marca y el comportamiento alineado con la marca entre todos los empleados de la empresa, no sólo entre los vendedores.

Palabras clave: Branding interno; embajadores de marca; identificación de marca del vendedor; empleados de primera línea; marcas de moda; competitividad.

Código JEL: M370, M540.

INTRODUCTION

The concept of 'brand ambassador' plays a vital role in the fashion industry, although the literature shows at least three distinct interpretations. The most common usage is that of a celebrity endorser formally designated by the fashion brand (Barron, 2019; Caan & Lee, 2023; Wigley, 2015). The term is also applied to a social media fashion influencer who takes the initiative or is invited by a company to create online content endorsing their brand (Pedroni, 2022; Sanmiguel et al., 2018; Smith et al., 2018).

A third and arguably older interpretation is the "employee brand ambassador." This usage is less frequent in the fashion literature, even though the major brands are keenly aware of front-line employees and sales associates' importance in connecting with customers (Hui & Yee, 2015; Ton et al., 2010).

In recent years, the literature on internal branding has dramatically advanced the study of employee brand ambassadors. Numerous studies, particularly from the hospitality industry, have systematically examined the organizational practices that shape employee attitudes and behavior in the service of the brand (King, 2010; Terglav et al., 2016; Chung & Byrom, 2021; Xiong, 2023).

Hospitality organizations are well aware of the importance of creating a differentiated (i.e., branded) customer experience in order to achieve a competitive position and the critical role employees play in that endeavor (Hurrell & Scholarios, 2014; Garavan et al., 2022; King & Murillo, 2022; Qureshi et al., 2022).

Brands in the fashion industry share this awareness, especially those operating branded retail organizations. They invest substantial resources in recruiting and training personnel to develop employee brand ambassadors meaningfully connecting with their customers in retail settings (Ton et al., 2010). Indeed, "fashion retailers are not just in the business of selling clothes; they are selling a lifestyle" (Cutcher & Achtel, 2017, p. 2), an endeavor that requires employees who are knowledgeable and committed to the fashion brand they represent.

A literature review found no articles about fashion organizations' efforts to develop their employees into competent brand ambassadors using internal branding, which suggests a relevant gap. Given the critical role employees play in representing the fashion brand to customers in retail settings, this study examines the internal branding processes of a sportswear fashion firm with a global brand, an extensive retail network, and well-established onboarding practices and training materials. Accordingly, survey data were collected from employees at the corporate office and the retail network in Mexico, a significant consumer

market for this brand. Results show that the company's brand training efforts significantly influence both retail and corporate employees and that they display greater brand understanding, identification, and commitment, which in turn contribute to brand-aligned behavior. The study thus finds evidence of internal branding processes and a clear intent to turn employees into competent brand ambassadors.

This study starts with a literature review of both fields addressed in the research: on the one side, the vision of the fashion and retail industry about the role of employees as brand ambassadors, and on the other side, an evolution of the concept of internal branding. Both fields allow us to introduce the hypotheses. Then, the methodology is explained, and the primary data and models are presented. Finally, the discussion introduces a brand ambassador model for the fashion industry and targets new possible directions for researchers in the area.

THEORETICAL BACKGROUND

Employee brand ambassadors in the fashion industry

For fashion organizations, the human factor is one of the pillars of branding, given that front-line employees act as the interface between the brand's internal and external environments, thereby strongly influencing customers' perceptions (Brodie et al., 2009; Chung et al., 2020). Exemplary service organizations have historically agreed that the brand's values should be communicated through employees' interactions with customers (e.g., Dekker, 2014; Wirtz & Zeithaml, 2018). Therefore, depending on the employees' internalization of the brand's values, their behaviors will reinforce or undermine the brand's advertised values during customer interactions.

Herein lies the marketing rationale for recognizing and leveraging the role of employee brand ambassadors (Gelb & Rangarajan, 2014; Schmidt & Baumgarth, 2018), for it is they who must bring the brand alive towards customers and deliver on the promises made through external marketing communications (Brodie et al., 2009). Furthermore, organizations usually consider all their employees, not just front-line, as brand ambassadors (Schmidt & Baumgarth, 2018), following the logic that corporate staff must lead by example. In addition, companies should have recovery strategies for unsatisfied clients with service breakdown prevention actions and face-to-face training to guarantee high-quality service (Woodside & Mir-Bernal, 2020).

For fashion organizations, contact between customers and company employees usually occurs in branded retail stores. Most fashion brands operate at least some branded stores, as these are "where they can express brand identity and reinforce a brand's power" (Arrigo, 2018, p. 121). These stores leverage the role of company employees as fashion brand

ambassadors, relying on the significant impact their behavior can have on customers' shopping experience and brand perception (Gammoh et al., 2014; Kim & Kim, 2012; Ton et al., 2010). Interpersonal interaction between the salesperson and the customer influences customers' attitudes and loyalty toward the brand (Brexendorf et al., 2010).

Salespersons' identification with the brand positively influences their brand-supporting behaviors and sales efforts (Badrinarayanan & Laverie, 2011). Any misalignment between the company and the salespersons' perceptions of the brand has potential adverse effects not only on salesforce satisfaction, commitment, and performance but also on how the brand is represented in front of customers (Anisimova & Mavondo, 2010; Gammoh et al., 2014). Aligning salespeople's views of the brand to what is being communicated to external stakeholders is essential to deliver a consistent and strong brand message in the marketplace (Gammoh et al., 2014). The persuasion mechanism of influence in young people has been reviewed with the emerging term of influencer and its difference from the concept of influence and the effects on young new consumers (Sanmiguel & Sádaba, 2018).

Major fashion brands are aware of the critical role played by their employees in portraying the brand values (Pettinger, 2004; Storemark & Hoffmann, 2012; Sum & Hui, 2009) and historically have invested substantial resources to turn them into effective brand ambassadors (Ton et al., 2010). However, empirical research on these internal branding processes within fashion firms must be more extensive. This study draws from the internal branding research stream, which has systematically examined these processes in service industries.

Internal branding

Internal branding is "the activities undertaken by an organization to ensure that the brand promise, reflecting the espoused brand values that set customers' expectations, is enacted and delivered by employees" (Punjaisri & Wilson, 2011, p. 1523). This research area, also known as internal brand management, studies the organizational processes that firms have enacted to ensure their employees have the knowledge and attitudes they need to conduct themselves as brand ambassadors (King et al., 2023).

Because hospitality firms strive to create differentiated customer experiences through comprehensive training (Hurrell & Scholarios, 2014; Garavan et al., 2022), internal branding research has focused historically on the hospitality industry (Punjaisri & Wilson, 2011; Terglav et al., 2016; Zhang & Xu, 2021; Qureshi et al., 2022). However, the fundamental constructs have been studied in other service industries, including airlines (Vatankhah & Darvishi, 2018; Murillo, 2022), financial services (Garas et al., 2018; Taku et al., 2022), universities (Clark et al., 2020; Murillo & Atristain-Suárez, 2023), healthcare (Huang & Lai, 2018), ride-sharing platforms (Murillo & Terán-Bustamente, 2020); retail (Murillo, 2020; Porricelli et al., 2014), and public sector organizations (Leijerholt et al., 2022).

Over the years, internal branding researchers have systematically identified the various practices service organizations implement to achieve brand-aligned employee behavior and validated multi-item scales to measure the associated constructs (Piehler et al., 2016; Xiong et al., 2013). These practices include brand-oriented recruitment (King & So, 2015; Murillo & King, 2019), brand-oriented training (Huang & Lai, 2018; King & So, 2015; Murillo & King, 2019), and brand-oriented leadership (Terglav et al., 2016; Ayrom & Tumer, 2021; Xiong, 2023).

Among these, brand-oriented training is the most frequent organizational practice aimed at shaping employees' brand behaviors. In that sense, it can be the core practice in the internal branding toolkit. Indeed, some studies do not measure brand training separately but only a global internal branding construct with a prevalence of brand training items (Huang & Lai, 2018; Punjaisri & Wilson, 2011). In studies that explicitly measure brand training, the construct appears under different labels, such as brand training (Murillo & King, 2019), brand-oriented training (King & So, 2015), brand knowledge dissemination (King, 2010), and brand-centered training (Buil et al., 2016).

To deliver a differentiated customer experience, employees must thoroughly understand the fashion brand. It includes factual knowledge of the brand identity, heritage, values, and the promises made to customers through external advertising (Brodie et al., 2009). In addition, the employee must learn the specific behaviors the brand translates into during customer service encounters (Fleming & Witters, 2012).

Employee brand understanding is, therefore, a prerequisite of brand promise delivery among fashion employees (Piehler et al., 2016; Xiong et al., 2013). Defined here as the cognitive representation of the brand within employees' minds (Baumgarth & Schmidt, 2010), brand understanding is the proximal outcome organizations seek through brand training, particularly among new hires (King & So, 2015; Murillo & King, 2019).

Studies of brand understanding have shown that enhancing employees' cognitive grasp of the brand brings about several positive impacts, including greater brand identification (Piehler et al., 2016), brand commitment (Xiong et al., 2013; Piehler, 2018; Ruzzier et al., 2021; Taku et al., 2022), and brand performance (Xiong et al., 2013; Piehler et al., 2016; Piehler, 2018; Zhang & Xu, 2021).

These studies confirm that brand training is the proximal driver of brand understanding (King & So, 2015; Murillo & King, 2019; Murillo, 2022). Furthermore, recent studies taking a more fine-grained longitudinal view have shown that even for simple jobs, such as restaurant servers, a thorough grasp of the desired customer experience (i.e., the brand promise) and

their role in delivering it can take months to be fully internalized, thus emphasizing the importance of a sustained training effort (Murillo & King, 2019). Based on these previous studies, the first hypothesis is formulated thus:
H1 Brand training has a positive impact on brand understanding.

Another proximal outcome of brand training is brand identification, defined here as "the degree to which a person defines himself—or herself by the same attributes that he or she believes define a brand" (Hughes & Ahearne, 2010, p. 84). In contrast to other conceptualizations of brand identification (Piehler et al., 2016), it is viewed here as a primarily cognitive attitude resulting from increased knowledge about the fashion brand, which constitutes the core content of brand training programs.

This brand identification view aligns with the cognitive dimension of organizational identification in Bergami and Bagozzi's (2000) cognitive, evaluative, and emotional social identification model. In the context of the fashion employee, brand identification involves the integration of perceived brand identity into self-identity (Hughes & Ahearne, 2010). Since brand identification is a cognitive response to knowledge about the brand, it is enhanced by brand training and increased understanding of the brand (Piehler et al., 2016). Therefore, the following hypotheses are advanced.
H2 Brand training has a positive impact on brand identification.
H3 Brand understanding has a positive impact on brand identification.

A core employee attitude identified since early internal branding studies is brand commitment, defined as "an employee's psychological attachment or feeling of belonging to the brand" (Xiong et al., 2013, p. 349). In contrast to brand understanding and identification, brand commitment has been conceptualized as an affect-based attitude that has brand understanding and brand identification as proximal antecedents (Punjaisri & Wilson, 2011; Piehler et al., 2016; Terglav et al., 2016; Murillo & Terán-Bustamante, 2020; Ruzzier et al., 2021; Zhang & Xu, 2021). Accordingly, it is proposed:
H4 Brand understanding has a positive impact on brand commitment.
H5 Brand identification has a positive impact on brand commitment.

The outcome sought by internal branding programs is to elicit brand-aligned behavior from employees, which most studies refer to as employee brand performance. Ideally, this behavior should stem from both the mind and the heart. In the final analysis, internal branding "deals with implementing the brand cognitively, affectively and behaviorally at the employee level" (Piehler, 2018, p. 217). It is easy to see how this agenda would be critical to a fashion brand and how cognitively and affectively engaged employees provide the best interface between the brand and external customers.

Multiple studies have found substantial and significant impacts of brand understanding on brand performance (Murillo & King, 2019; Murillo & Terán-Bustamante, 2020; Piehler, 2018; Xiong et al., 2013; Zhang & Xu, 2021). Brand identification has also shown significant direct effects on performance (Helm et al., 2016; Punjaisri & Wilson, 2011; Taku et al., 2022), although the relationship failed to reach significance in other studies (Piehler et al., 2016). Lastly, the positive relationship between brand commitment and brand performance has been confirmed on numerous occasions from the earliest internal branding studies (Xiong et al., 2013; Du Preez et al., 2017; King, 2010; Piehler et al., 2016; Qureshi et al., 2022; Zhang & Xu, 2021). Based on previous research, the following hypotheses are proposed.

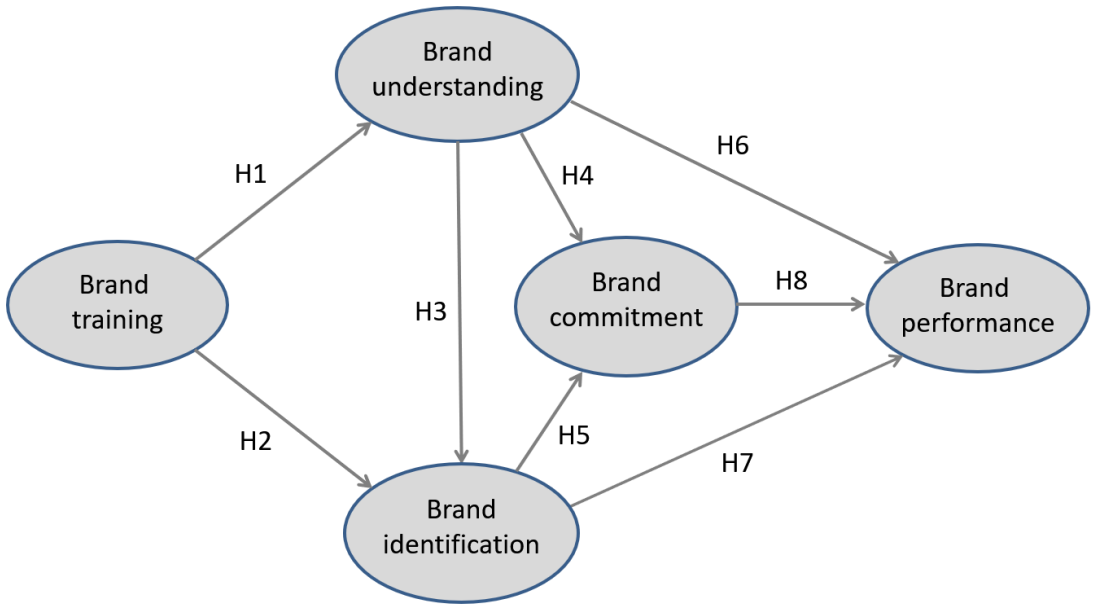
H6 Brand understanding has a positive impact on brand performance.

H7 Brand identification has a positive impact on brand performance.

H8 Brand commitment has a positive impact on brand performance.

Based on the above discussion, the proposed research model is displayed in Figure 1.

Figure 1
Hypothesized research model



Source: Own elaboration.

METHODS

Data collection

Survey data were collected in the Mexico City corporate office and the regional retail network of a global sportswear fashion brand. The company operates 37 branded stores in the country with a total headcount of approximately 500 employees. Preliminary interviews

with the company's training manager provided a good overview of the firm's onboarding efforts and its clear intent to develop employee brand ambassadors among all personnel. Newly hired employees undertake a two-day orientation where the company and brand culture are thoroughly explained. It is followed by an additional day of on-the-job training. Training materials and workshops strongly emphasize the sports brand and, especially for store employees, the desired customer experience.

The survey instrument was hosted on a professional online platform (Qualtrics) to facilitate distribution to a dispersed workforce and enable respondents to answer using a PC or smartphone. The survey was anonymous to encourage candid responses from participants.
The survey link was distributed through an email invitation sent by the training manager to all employees at the corporate headquarters and the retail stores. Within two weeks, 80 usable surveys were collected from corporate and 61 from the stores, representing a response rate of 51% and 25%, respectively, in line with other employee surveys administered by the company.

Measurement and scale validation
Previously published scales were used to measure all variables in the model. For brand-oriented training, two items from the scale by King and So (2015) are complemented with two from the knowledge dissemination scale by King (2010). Brand commitment is measured using four items from the scale by Kimpakorn and Tocquer (2010). Brand identification, with two items from the scale by Gammoh et al. (2018). Brand understanding, with four items from the brand knowledge scale by Xiong et al. (2013). Brand performance, with three items from Xiong et al.'s (2013) scale for brand consistent behavior.

The Appendix lists all the scales and items used in this research. The scales were translated to Spanish following a team approach (Harkness, 2003). The training manager reviewed all translated items and made minimal wording adjustments to ensure clarity and better match the organizational context.

Because data were collected with a single instrument using self-report measures, common method variance (CMV) can potentially affect results (Podsakoff et al., 2012). Accordingly, a marker variable that is theoretically unrelated to the study constructs was included in the survey instrument, specifically, three items measuring preference for solitary work (Ramamoorthy & Carroll, 1998), which meet the criteria for an "ideal marker" (Simmering et al., 2015).

Two statistical remedies were used to assess and control for CMV. First, the Harman single-factor test was used to run an exploratory factor analysis of all the items, with principal axis factoring extraction restricted to a single factor and non-rotated solution. The single factor

extracted explained 42.5% of the covariance of the items, showing that no single factor explains the majority of the covariance, indicating CMV data contamination. Second, the construct level correction technique that Chin et al. (2013) proposed was applied by modeling a CMV control variable with the theoretically unrelated marker variable. This control variable predicted all endogenous latent variables in the final model.

The results with and without CMV controls show minimal changes in estimated path coefficients and R^2 squared values and no significant changes. This finding confirms CMV does not pose an issue in this study.

As an initial assessment of the validity and reliability of the multi-item scales, a confirmatory factor analysis (CFA) was estimated using Mplus v. 8.3. Accordingly, Table 1 shows the means, standard deviations, and correlations of observed variables, and Table 2 shows the CFA results.

Table 1
Means, standard deviations, and correlations among observed variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. BRC1	--																
2. BRC2	.39	--															
3. BRC3	.42	.33	--														
4. BRC4	.54	.51	.30	--													
5. BRPF1	.23	.49	.36	.48	--												
6. BRPF2	.35	.56	.33	.55	.63	--											
7. BRPF3	.45	.48	.34	.68	.61	.55	--										
8. BU1	.47	.45	.29	.54	.47	.55	.61	--									
9. BU2	.41	.50	.33	.45	.50	.59	.48	.52	--								
10. BU3	.33	.48	.32	.40	.48	.56	.48	.49	.66	--							
11. BU4	.38	.40	.30	.53	.52	.53	.58	.62	.60	.67	--						
12. IDENT1	.47	.36	.10	.46	.30	.36	.42	.50	.33	.32	.38	--					
13. IDENT2	.52	.51	.28	.63	.48	.63	.62	.61	.52	.58	.65	.55	--				
14. TRAIN1	.34	.29	.18	.23	.24	.21	.28	.46	.33	.29	.30	.39	.31	--			
15. TRAIN2	.27	.29	.12	.23	.29	.27	.41	.30	.23	.28	.22	.24	.33	.49	--		
16. TRAIN3	.60	.34	.26	.29	.23	.28	.33	.42	.36	.36	.32	.45	.36	.51	.49	--	
17. TRAIN4	.39	.37	.30	.31	.35	.38	.39	.48	.43	.43	.37	.28	.38	.39	.30	.53	--
Mean	4.09	4.66	3.51	4.60	4.42	4.50	4.62	4.48	4.57	4.51	4.46	4.38	4.41	3.88	4.16	3.99	4.15
SD	1.05	.54	1.13	.61	.59	.57	.54	.64	.55	.55	.62	.79	.65	1.12	.91	.89	.90

Source: Own elaboration.

The results in Table 2 show an adequate fit for the CFA model with $\chi^2(df = 109) = 185.006$, p = .000, CFI = .920, RMSEA = .070, SRMR = .063. Cronbach alphas above 0.70 suggest adequate scale reliability for the five latent constructs. A possible concern is that the average variance extracted (AVE) is slightly below the recommended level of 0.50 for the brand training and commitment scales. In contrast, AVE values above 0.50 indicate convergent validity for the remaining scales.

Since the hypothesized model will be estimated with the partial least squares (PLS) technique, which is designed to maximize the explained variance of the latent variables, a judgment on the convergent validity of brand training and brand commitment will be deferred until PLS results are available, while nevertheless making a note of the two low AVE's.

Table 2
Confirmatory factor analysis results

Indicator	Loading
BRTRAIN (Alpha = .76, AVE = .46)	
TRAIN1	.66
TRAIN2	.60
TRAIN3	.79
TRAIN4	.65
BRUND (Alpha = .85, AVE = .60)	
BU1	.75
BU2	.75
BU3	.77
BU4	.82
BRCOM (Alpha = .69, AVE = .42)	
BRC1	.65
BRC2	.68
BRC3	.45
BRC4	.78
BRIDENT (Alpha = .70, AVE = .59)	
IDENT1	.61
IDENT2	.89
BRPERF (Alpha = .82, AVE = .59)	
BRPF1	.72
BRPF2	.78
BRPF3	.80

Source: Own elaboration.

Hypothesized model estimation

Structural equation modeling (SEM) is needed to estimate the hypothesized model, which contemplates a system of eight hypotheses. While covariance-based SEM (CB-SEM) is the preferred technique for theory testing, it requires relatively large sample sizes and data compliance with the assumption of multivariate normality (Hair et al., 2022). SPSS analysis of kurtosis and skewness indicated a violation of multivariate normality in the dataset. This fact recommends using PLS as the model estimation technique because, unlike CB-SEM, it does not make distributional assumptions (Hair et al., 2022). Furthermore, this study is exploratory, applying an internal branding model to a previously unexamined context. Accordingly, PLS is a more appropriate estimation technique because it has greater statistical power than CB-SEM and, therefore, faces a lower risk of prematurely rejecting candidate constructs (Reinartz et al., 2009).

Table 3

Indicator loadings, scale Cronbach alphas, and Composite reliabilities

Scale	Indicator loading	Cronbach alpha	Composite reliability
Brand training		0.769	0.851
TRAIN1	0.772		
TRAIN2	0.700		
TRAIN3	0.840		
TRAIN4	0.755		
Brand understanding		0.853	0.901
BU1	0.801		
BU2	0.825		
BU3	0.836		
BU4	0.868		
Brand identification		0.709	0.869
IDENT1	0.828		
IDENT2	0.923		
Brand commitment		0.739	0.834
BRC1	0.768		
BRC2	0.770		
BRC3	0.602		
BRC4	0.836		
Brand performance		0.815	0.890
BRPF1	0.857		
BRPF2	0.853		
BRPF3	0.852		

Source: Own elaboration.

The structural model was estimated using SmartPLS version 3.2.7 (Ringle et al., 2015). Following the recommendations of Hair et al. (2022), analysis of a PLS model starts with the assessment of the quality criteria for the measurement or outer model. Table 3 displays item loadings, Cronbach alphas, and composite reliabilities. All items achieved the recommended loading of 0.7 or above, except BRC3, with a loading of 0.602, which is considered acceptable for an exploratory study (Hair et al., 2022). The Cronbach alphas and the

composite reliabilities exceeded the recommended value of 0.70, indicating acceptable internal consistency of the measurement scales (Hair et al., 2022).

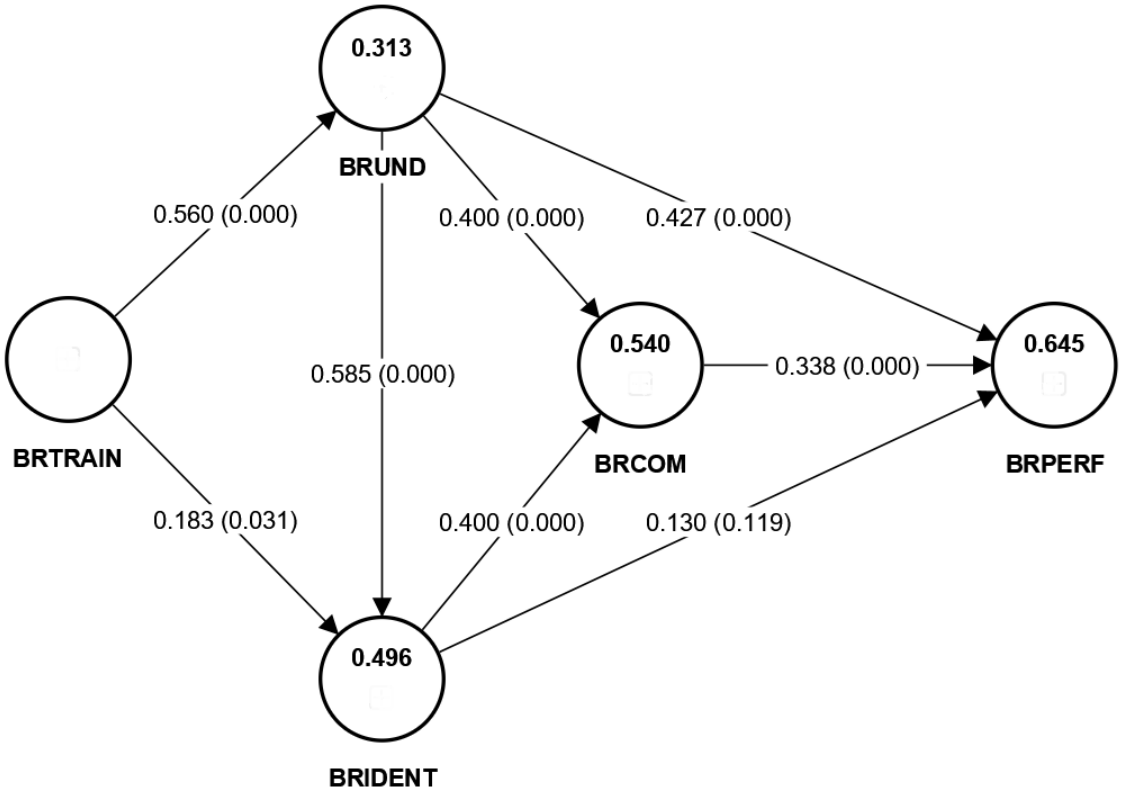
The PLS quality criteria also require an assessment of convergent and discriminant validity (Hair et al., 2022). To this end, Table 4 displays the average variance extracted (AVE), the square root of the AVE (in italics on the main diagonal), and the correlations between the latent constructs.

Table 4
Average variance extracted and inter-construct correlations

Variable	AVE	BRCOM	BRIDENT	BRPERF	BRTRAIN	BRUND
BRCOM	0.561	*0.749*				
BRIDENT	0.769	0.675	*0.877*			
BRPERF	0.730	0.715	0.652	*0.854*		
BRTRAIN	0.590	0.529	0.510	0.467	*0.768*	
BRUND	0.694	0.675	0.688	0.745	0.560	*0.833*

Source: Own elaboration.

Figure 2
Structural model estimation



Source: Own elaboration.

All PLS-estimated AVE values, including those of brand training and commitment, exceed the recommended 0.50 threshold, indicating acceptable convergent validity (Hair et al., 2022). Furthermore, in compliance with the Fornell-Larcker criterion, each of the elements on the main diagonal in Table 4 is larger than the respective row and column off-diagonal elements, which indicates adequate discriminant validity. In addition, the recently recommended HTMT criterion was also examined, and all values fell below the 0.90 threshold, confirming construct discriminant validity (Henseler et al., 2015). Therefore, with acceptable levels for the quality criteria of the PLS measurement model, the analysis can turn to the inner or structural model results (Hair et al., 2022), which are displayed in Figure 2.

The hypothesized model explains 64.5% of the variance of brand performance, which can be considered substantial (Chin, 1998). All path coefficients have the hypothesized positive signs, and most have a substantial magnitude. However, an additional procedure must be performed to establish statistical significance because PLS does not make distributional assumptions. A bootstrapping technique is used to generate confidence intervals for the path coefficients. Table 5 shows the procedure results using the recommended 5000 samples (Hair et al., 2022).

Table 5
Bootstrapping results and supported hypotheses

Hypothesized path	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Hypothesis support
BRTRAIN → BRUND	0.560	0.065	8.574	0.000	H1 ✓
BRTRAIN→BRIDENT	0.183	0.085	2.153	0.031	H2 ✓
BRUND → BRIDENT	0.585	0.066	8.829	0.000	H3 ✓
BRUND → BRCOM	0.400	0.081	4.947	0.000	H4 ✓
BRIDENT → BRCOM	0.400	0.084	4.738	0.000	H5 ✓
BRUND → BRPERF	0.427	0.088	4.880	0.000	H6 ✓
BRIDENT → BRPERF	0.130	0.083	1.558	0.119	H7 X
BRCOM → BRPERF	0.338	0.084	4.005	0.000	H8 ✓

Source: Own elaboration.

The results show that all estimated path coefficients except the path from brand identification to brand performance are significant. Therefore, hypothesis 7 is not supported. Notwithstanding this, model results reveal a significant impact of brand identification on performance through the mediation of brand commitment. All other hypotheses in the study are supported.

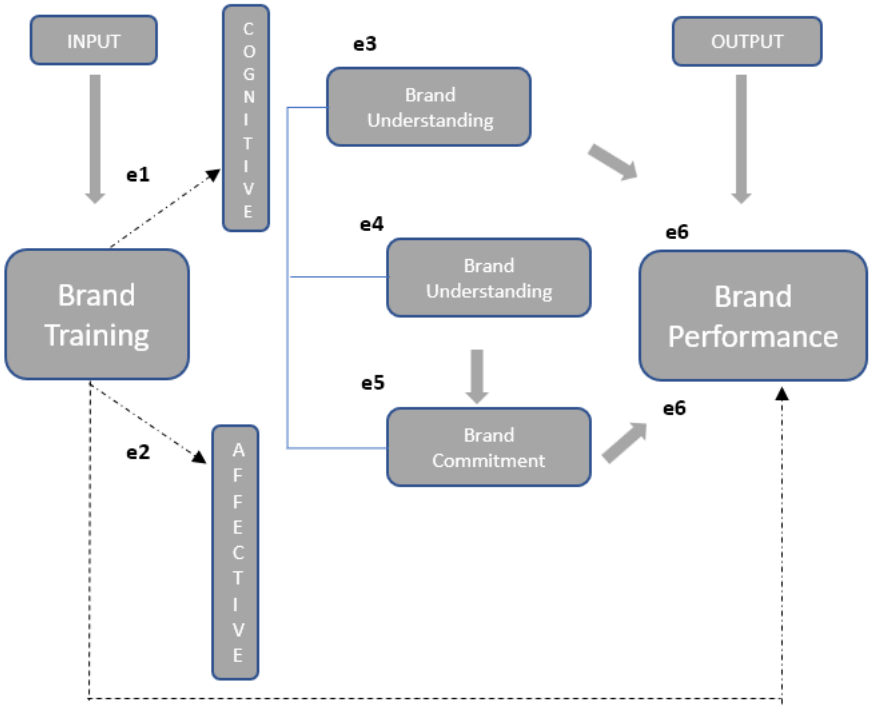
As an additional test of robustness and taking advantage of the small-sample capabilities of PLS (Hair et al., 2012), the dataset was split into corporate (n = 80) and store (n = 61) employees, and the model was separately estimated for each subsample. The results for store employees were essentially the same as for the complete sample, with a marginal increase in the explained variance of brand performance (71.5%) and no change in the significance of path coefficients. For corporate employees, the direct path from brand training to brand identification became non-significant, making the effect of training on identification fully mediated by brand understanding. However, the significance of all other relationships remained unchanged.

DISCUSSION AND IMPLICATIONS

This empirical study of employees at a sportswear fashion firm tested internal branding relationships that have been previously validated in studies from various service industries (Buil et al., 2016; Du Preez et al., 2017; Huang & Lai, 2018; Murillo, 2022; Taku et al., 2022; Terglav et al., 2016). Survey results show strong support for nearly all of the hypothesized relationships (even with brand identification mediated by brand commitment), suggesting that internal branding practices, as implemented in fashion organizations, deserve greater research attention to build a holistic understanding of the profile and role of employee brand ambassadors in the fashion industry, and the best ways of recruiting, training and leading them, a topic which the fashion literature has yet to examine. Accordingly, and based on the results of this study, an Employee Brand Ambassador's model is advanced, as displayed in Figure 3.

The principal contribution of this research is to conduct the first theoretically grounded empirical examination of internal branding processes within a fashion firm, as indicated by a thorough review of the fashion and fashion marketing literature. The authors found this gap in the literature somewhat surprising, given that the industry, as opposed to the scholarly community, has long been aware of the importance of front-line employees who must bring the brand alive for customers (Pettinger, 2004). However, the literature review revealed that current mentions of brand ambassadors in the fashion literature focus on celebrity endorsers or social media influencers, leaving employees in the background. This omission in the research literature does not reflect the real-world practice of major fashion brands, which take care from initial orientation to equip new hires with detailed knowledge of their brand to enable them to portray the brand values in their interactions with customers (Pettinger, 2004).

Figure 3
Employee Brand Ambassador's model



e1: brand training produces effect 1 which is the understanding of the brand in its rational dimension, performance, technical specs and specific product superiority.

e2: brand training also produces effect 2 which is an emotional attachment to the brand for several reasons: brand is investing in employee training, brand talks directly to employees, resulting in increased people engagement and brand like.

e3: training through brand explanations and brand storytelling shared to employees produce effect 3 which is a broader vision of the brand such as positioning and brand role which increases the brand understanding.

e4: is the result of the employee empathy to the brand: brand training generates emotional alignment with the corporate vision of the brand. It is a self-identification projection of the person towards the brand.

e5: brand understanding produces a better rational decoding of the brand role in the market, of the competitors and of corporate challenges, that generates employee commitment to their job and its execution.

e6: the final outcome is the employees' brand-aligned behaviors, which are visible to customers, and appear as an output of effects 1, 2, 3, 4 and 5. This is the intended outcome in companies through the implementation of a brand training program.

Source: Own elaboration.

The results of this study confirm industry practices and highlight critical managerial implications. First, the importance of spelling out during orientation and on-the-job training the differentiated brand promise of the fashion brand, which customers are familiar with through external brand marketing and expect to find clearly articulated by the company employees at branded stores. Second, it is essential to treat all company employees as brand ambassadors, not only those directly interacting with customers. It, in turn, translates into a

strong company commitment to brand training and brand communications at both the corporate and operational levels. The researched company's training manager aptly summed this up: "Sports fashion brands seek to turn their retail collaborators into brand ambassadors because having an informed, self-confident, empathetic element, with a DNA related to the brand, increases the positive shopping experience."

Given the exploratory nature of the research, the study centered on assessing the effectiveness of brand training, the core practice in the internal branding toolkit. Results show a strong and positive impact of training on brand-aligned behavior through the mediation of two cognitive constructs—brand understanding and identification—and one affect-laden construct, brand commitment. This model explained a substantial proportion of the variance in brand performance. However, including additional theoretically grounded predictors in the model may improve results.

Within the growing body of internal branding theory, at least three concepts can contribute to future studies of fashion organizations. The first is brand-oriented recruitment. Studies in hospitality have found that values-based recruitment and selection can improve workforce identification with the values of the hospitality brand (Hurrell & Scholarios, 2014; King & So, 2015), an issue that resonates with fashion firms. The second concept is employee brand values fit, "the extent to which the employees perceive their values are consistent with the brand's values" (Xiong & King, 2015, p. 61).

Studies show a strong impact of brand values fit on brand motivation and performance (Xiong & King, 2015; Murillo, 2020) and additional psychological benefits for employees through enhancing their organization-based self-esteem (Murillo, 2019). In addition, brand values fit has been found to improve traditional human resource indicators such as job satisfaction and intention to remain (Du Preez et al., 2017; Murillo, 2020). The third concept is brand-oriented leadership, where previous studies have established the influence that supervisors and managers can have on employee attitudes and behavior toward the brand (Ayrom & Tumer, 2021; Terglav et al., 2016; Xiong, 2023), especially after employees are well past the onboarding and initial training stage (Murillo & King, 2019).

This study's limitations are identified to improve future research designs. The study is based on survey data collected with a single instrument. However, statistical procedures were adopted to detect and control for CMV, and results from two tests found no evidence of biased results. Another limitation is the relatively small sample size, which was further evidenced when the subsamples of corporate and store employees were examined separately. Future studies should ideally get large samples of both types of employees in fashion firms. Finally, the generalizability of these results is limited to fashion organizations with a culture (both organizational and national) similar to the one examined by this research.

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Appendix – Measurement scales used in this study.

Brand training

TRAIN1 When I started working at [BRAND] the company took great care to give me an understanding of the brand.

TRAIN2 In all training programs the relevance of the particular training topic to our brand is demonstrated.

TRAIN3 [BRAND] communicates its brand promise well to employees.

TRAIN4 [BRAND] communicates the importance of my role in delivering the brand promise.

Brand knowledge

BU1 I know how to live our brand in my daily work.

BU2 I know how to act brand consistently in my daily work.

BU3 I know how to implement our brand into my daily work.

BU4 I know how to deliver our brand promise in my daily work.

Brand Identification

IDENT1 I feel that my self-image overlaps with [BRAND]'s brand image.

IDENT2 My sense of who I am overlaps with my sense of the [BRAND] brand.

Brand Commitment

BRC1 For me [BRAND] is the best of all possible brands to work for.

BRC2 I am willing to put in extra effort beyond what is expected to make the [BRAND] brand successful.

BRC3 I would accept almost any type of job assignment in order to keep working for the [BRAND] brand.

BRC4 I really care about the [BRAND] Brand.

Brand performance

BRPERF1 I demonstrate behaviors that are consistent with the brand promise of [BRAND].

BRPERF2 I consider the impact on [BRAND] before communicating or taking action in any situation.

BRPERF3 I am always interested to learn about [BRAND] and what it means to me in my role.

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Circular Economy: A Technological Innovation Strategy for Sustainability in Air Transport

Economía circular: una estrategia de innovación tecnológica para la sostenibilidad en el transporte aéreo

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ABSTRACT

This work aims to identify innovations, technological advances, and best practices to migrate towards a circular economy in air transport. The relevance of the research lies in the contribution to the generation of circular economy knowledge in the field of administration with application in the aeronautical industry. By analyzing literature and best practices, the circular economy could be a viable solution to reduce the use of natural resources in aircraft manufacturing and airport operations. Among the main findings are innovations and technological developments in new materials, fuels, building methods, and best practices implemented at airports to obtain energy and generate less waste. It has also been identified that applying circular economy principles in this mode of transport would contribute to sustainability efforts and increase the competitiveness of organizations in the sector.

Keywords: Innovation, Sustainability, Air transport, Circular Economy, Competitiveness.

JEL code: L93, M16, O320

RESUMEN

Este trabajo tiene como objetivo identificar innovaciones, avances tecnológicos y mejores prácticas para migrar hacia una economía circular en el transporte aéreo. La relevancia de la investigación radica en el aporte a la generación de conocimiento sobre economía circular en el campo de la administración con aplicación en la industria aeronáutica. Al analizar la literatura y las mejores prácticas, la economía circular podría ser una solución viable para reducir el uso de recursos naturales en la fabricación de aeronaves y las operaciones aeroportuarias. Entre los principales hallazgos se encuentran innovaciones y desarrollos tecnológicos en nuevos materiales, combustibles, métodos de construcción y mejores prácticas implementadas en los aeropuertos para obtener energía y generar menos residuos. También se ha identificado que aplicar principios de economía circular en este modo de transporte contribuiría a los esfuerzos de sostenibilidad y aumentaría la competitividad de las organizaciones del sector.

Palabras clave: Innovación, sustentabilidad, transporte aéreo, economía circular, competitividad.

Código JEL: L93, M16, O320

INTRODUCTION

In 2015, with the Millennium Development Goals, countries, firms, and non-governmental organizations joined efforts to reduce technological gaps and extreme poverty and ensure access to health, education, and gender equity by adopting the Sustainable Development Goals (SDGs). The SDGs guide implementing actions to improve people's quality of life worldwide while mitigating global warming. (UN, 2023; COP26, 2021a; Barbier & Burgess, 2019)

Although transport modes are not a specific SDG objective, they are integrated transversally. It impacts other objectives, particularly those related to food security (facilitating the transfer and distribution of food), health (bringing health services to marginalized areas through mobile units, as well as facilitating the mobility of people), energy, and infrastructure, to name a few. It is also considered an important aspect of achieving the SDGs as a quarter of the world's energy-related greenhouse gas emissions come from transportation, and these are expected to increase substantially in the coming years. (COP26, 2021a)

According to figures issued during COP26 in 2019, worldwide transportation is considered the fourth largest pollutant emission, especially greenhouse gases (GHG), after energy, industry, and agriculture. These figures represent 15% of GHG emissions, including CO2 emissions, which contribute 23% and are responsible for consuming about 40% of the energy worldwide. GHG emissions are generated by land transport and air transport (passenger and cargo).

Air transport is an important part of the world economy due to its strong inter-industrial links with upstream and downstream sectors of aircraft production despite representing a small percentage of the value added of the member countries of the Organization for Economic Cooperation and Development (OECD) (approximately 0.03%). (OECD, 2020; COP26, 2021ba)

In context, the aviation or aeronautical industry includes activities related to airport operations, maintenance, repair and operations services, aircraft manufacturing, rental and leasing services, and refined oil production (including the blending of biofuels), among others; therefore, it requires state-of-the-art technologies, constant innovation, and skilled labor to ensure the safety of users and service providers. (Celikel, Rötger & Casas, 2022)

Individually, each activity developed in the aeronautical industry produces waste and contributes to CO2 generation; 97% of pollutants are generated during flights, 2% in ground operations, and 1% in aircraft production. (Domone et al., 2021)

According to Buticchi, Wheeler and Boroyevich (2022) and Kobeh (2008) stakeholders such as leaders of the world's economies, airlines, aircraft manufacturers, airport operators, and international regulatory bodies have joined forces to reduce the impact that aviation has on the environment, resulting in initiatives and policies for the use of new technologies to produce aircraft that generate less noise, operate with less polluting fuels, use new materials, implement new practices at airports, and modify existing infrastructure.

However, this is not enough because although there is a commitment to reduce the adverse effects of aviation, the world is also facing some geopolitical problems, such as war or trade tensions, which have had an impact on the procurement of raw materials and critical components for the manufacture of engines and aircraft assembly (AviaciónDigital, 2022). Therefore, the proposal to migrate to a regeneration and reuse economy has been outlined as an alternative to meet the SDGs and market demands.

This paper has a descriptive scope, and its objective is to identify innovations, technological developments, and best practices to migrate towards a circular economy in air transportation. The technologies and actions implemented in this mode of transport are identified by reviewing secondary sources. This work is relevant because it contributes to the generation of knowledge in the field of management on the application of the circular economy in the aeronautical industry; according to the literature review, more than 65% of the identified documents belong to the engineering field.

This research is structured as follows: First, the theoretical framework is presented from the perspective of the circular economy and its relationship with competitiveness. Another section presents the literature review on circular economy in air transport, the technologies identified as viable to contribute to the change of the economic model, and the practices that some airports have implemented. Finally, some reflections and challenges are presented.

CIRCULAR ECONOMY AND COMPETITIVENESS

Since the beginning of the Industrial Revolution, a productive system has prevailed in which goods are generated from the exploitation and transformation of raw materials, which are sold, exploited, and subsequently discarded, generating an overexploitation of natural resources and an emission of waste and pollutants. Since the world conference on climate change held in Paris (2015) and Glasgow (2021), more than 70% of raw materials have been extracted than the Earth's capacity to renew them safely. Therefore, given the depletion of natural resources, implementing a new economic model and new production systems has become crucial (Popović et al., 2022).

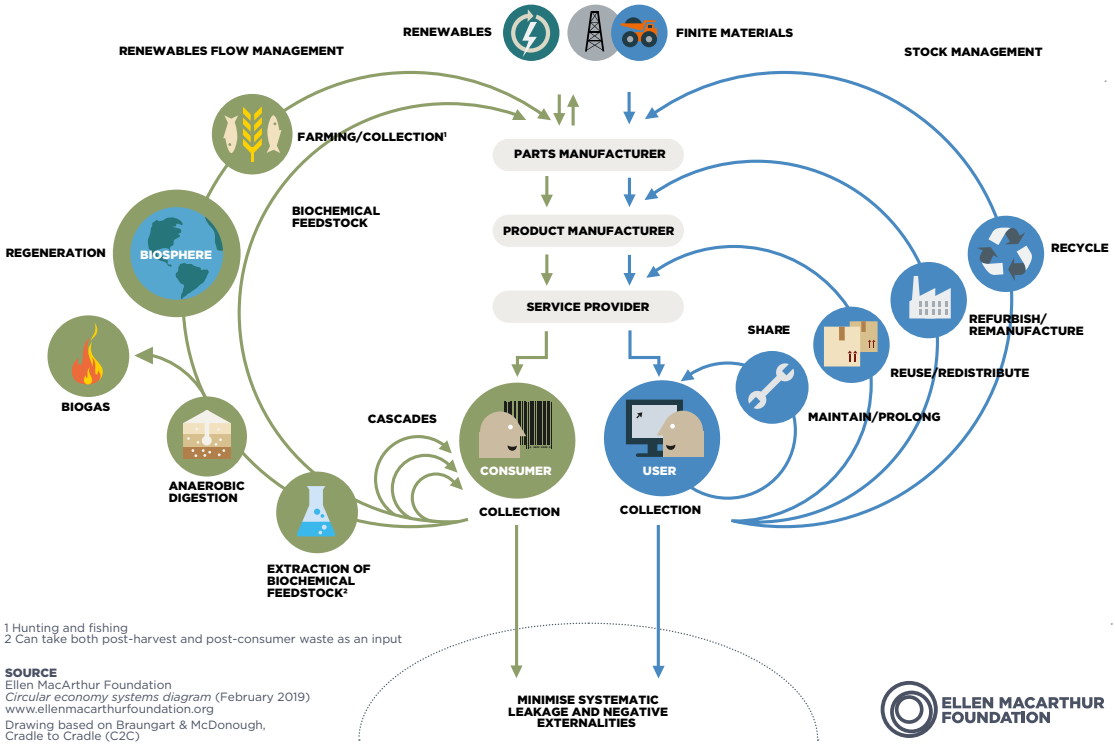
The circular economy (CE) originated with the idea of reducing the resources and inputs used in industrial production, proposing an alternative to the linear economy (extract - produce - dispose) production model that has been used to date (Hungaro et al., 2021). It was proposed to migrate towards a circular economy to minimize waste and pollution, using resources best and keeping products and materials in use for as long as possible, recovering and regenerating products and materials at the end of each useful life (MacArthur, 2013).

Although it was first used in the 1970s, the concept of CE has had a more extraordinary boom and relevance starting in the decade of the new millennium (2000), being associated with sustainable development (Korhonen et al., 2018). The circular economy is based on the following: the design of manufactured products with added value and maximum use in longer life cycles; the creation of versatile products with different uses in different periods of their useful life, seeking to ensure the reuse of the same good; the return of solid waste to the industrial sector in an orderly manner. The cost of secondary raw materials from recycling is competitive in the market, and a systemic approach to supply chain management evaluates the interconnections between the energy produced, the material extracted, and the natural environment (Hungaro et al., 2021; MacArthur, 2013).

According to MacArthur (2013), the circular economy is defined as "one that is restorative by design, and aims to keep products, components, and materials at their maximum utility and value, at all times" has three principles:

1. Waste equals food: redefining the purpose of goods at the end of their useful life by prolonging durability and minimizing impacts on ecological systems from manufacturing new products. Within a closed loop, proper maintenance, reuse, refurbishment, and recycling can extend the life cycle of products. (MacArthur, 2013)
2. Use renewable resources: By increasing renewable or waste-derived resources and energy, the circular economy model could create jobs and reduce environmental impact, including carbon emissions. (MacArthur, 2013)
3. Increasing resistance through material innovation takes care of raw material consumption and the reproduction of waste to reorient products from one manufacturing process to another. Therefore, designing a circular economy model requires combining various companies and stakeholders, which play different roles within a circular economy system. (MacArthur, 2013)

Figure 1
Diagram of the Ellen MacArthur Foundation's circular economy system



Source: Adapted from The Ellen MacArthur Foundation (2022).

Figure 1 shows a system based on the principles of the circular economy. It is known as a butterfly diagram, in which the continuous flow of materials is observed in two cycles: the technical and the biological. In the first cycle, products and materials are kept in circulation through reuse, repair, remanufacturing, and recycling strategies. In the second cycle, nutrients based on biodegradable materials are returned to the Earth System to regenerate nature (The Ellen MacArthur Foundation, 2022).

As an alternative model, circular economy principles offer operational and strategic advantages at the micro and macroeconomic levels, which, when driven by technological advances and developments, represent an excellent opportunity to influence economic development and growth systemically (Popović et al., 2022). These principles find application in different industries and sectors, including transportation, by reducing the use of "new" materials and reducing the generation of greenhouse gases in the transformation of the same; however, it requires the adoption of technology that gives new use to those parts and components whose useful life has ended, in addition to implementing the use of new materials that allow their transformation and reuse simply (Bleischwitz et al., 2017). Also,

some strategies are considered to take advantage of using materials and mitigate the negative impact on society and the environment. (Potting et al., 2017)

As shown in Figure 2, the circular economy aims to reduce the use and extraction of natural resources through the application of the 9Rs: refuse, rethink (redesign), reduce, reuse, repair, renew, recycle, and recover, based on the idea that in nature everything has value and everything is used to produce value, where waste becomes a new resource (Korhonen et al., 2018). In this way, the product's life cycle is extended, waste is used, and, over time, a more efficient and sustainable production model is established. It maintains the balance between progress and sustainability. (REPSOL, 2022)

A higher level of circularity of materials in product chains means that, in principle, smaller quantities of natural resources will be needed to produce new (primary or virgin) materials. The avoided production of materials benefits the environment. In practice, however, increasing the circularity of one product chain may lead to lower circularity in another. (Korhonen, Honkasalo & Seppälä; 2018)

Figure 2. Circular economy strategies

	Strategies		
Circular economy	Smart production and use of manufacturing.	R0 Refuse	Create a product redundant.
		R1 Rethinking	Develop new uses for assets.
		R2 Reduce	Consume fewer and more efficient resources.
Increase circularity	Extend the life of parts and products	R3 Re-use	Reuse of products/components in operations.
		R4 Repair	Repair to maintain benefits.
		R5 Refabricating	Reintegrate and renew to maintain performance.
A higher level of circularity = lower natural resource requirements		R6 Remanufacturing	Operate components in a new product with the same function.
		R7 Readapt	Operate components in a new product with different function.
	Application and Material Utilities	R8 Recycle	Process materials ready for the new plant.
Linear economy		R9 Recover	Energy recovery through incineration.

Source: Own elaboration (Potting et al., 2017; Domone et al., 2021).

For the principles of a circular economy to be implemented, companies must have the necessary resources and capabilities to implement changes in their practices and products, from design to the selection of new materials that can be recycled and reused. In the first

instance, this would mean a competitive advantage by reducing raw material costs. (Varaniute, Zickute & Vecerskiene, 2023)

Competitiveness is a company's capacity to create and implement competitive strategies and sustainably maintain or increase its market share. These capabilities are related to various factors, controlled or not by the companies, ranging from the technical training of personnel and managerial/administrative processes to public policies, the supply of infrastructure, and the peculiarities of demand and supply (Haguenauer et al., 1996). A company is said to have a competitive advantage when it applies a value-creation strategy that is not being applied simultaneously by any current or potential competitor (Barney, 1991, p. 102).

The circular economy is increasingly relevant to business strategies (Mishra et al., 2022), as it "opens up opportunities for companies to build competitive advantage, create new profit pools, develop resilience, and provide solutions to some of the most important problems facing businesses today" (De Angelis, 2021; Saari et al., 2022).

CIRCULAR ECONOMY IN AIR TRANSPORT

The literature review indicates that the relationship between circular economy and air transportation is an emerging topic of study. The search for information in the Scopus database, using the keywords "aviation AND circular economy" and "air transportation AND circular economy," resulted in a total of 53 articles, of which 66% belong to the engineering area of study, describing alternatives for new fuels, materials, novel designs, and best practices in the operation of aircraft and airports.

In this sense, the global value chain of the aerospace industry has the potential to be reshaped through the principles of the circular economy (ICAO, 2022), from the design of aircraft, their parts, and components to their end-of-life management and use. At its inception, the commercial aerospace industry naturally established a linear economy in which economic value is attached to products (aircraft, spare parts), with economic growth closely linked to the use of natural resources (Domone et al., 2021).

An aircraft is used during its useful life, comprising 30 years for passengers and 20 years for cargo aircraft. This operation is maintained through the purchase and changes of worn parts whose life reached its limit according to the flight hours of the aircraft (Celikel, Rötger & Casas, 2022). In the end, parts and components of the aircraft were discarded as waste. This approach was the premise that materials were cheap and labor was expensive, so the value of reuse or recycling could have been higher.

On the side of mitigating the airline industry's environmental impact, this has been focused on waste management. However, increased attention to environmental sustainability and increased legislative and social pressure on aerospace organizations have led to changes in the supply chain. Aircraft that had reached their end of life were stored at airports or in dedicated storage facilities such as the world's largest aircraft graveyard: the Aerospace Maintenance and Regeneration Group (AMARG), which is located at Davis-Monthan Air Force Base in Tucson, Arizona.

Based on the circular economy strategy, some initiatives for aircraft recycling have been developed and implemented, such as the PAMELA project promoted by Airbus. However, these are still considered incipient because there is no international regulation for aircraft end-of-life management (Dolganova et al., 2022).

In addition, the linear economy model used for aircraft production consumes large amounts of energy and is highly dependent on material resources such as titanium, steel, aluminum, aluminum alloys, and composites (often including polymers and carbon fiber) (Dolganova et al., 2022), which casts doubt on the environmental impact of air transport in 2035.

The transition from a linear to a circular economy is a proposal to optimize polluting emissions or waste related to the production and maintenance of aircraft. By recycling and reusing products instead of discarding them after use, the circular economy preserves the value of products and materials better than the current linear economy. The circular economy also helps reduce or eliminate production-related greenhouse gas emissions by minimizing the demand for materials, energy, and waste generation. These principles can be applied mainly in two areas of air transport: 1. aircraft manufacturing and 2. airport management.

AERONAUTICAL INNOVATIONS AND THE CIRCULAR ECONOMY

According to the Oslo Manual (OECD, 2018), an innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and has been made available to potential users (product) or put into use by the unit (process). However, it focuses on innovating products and improving business models and services by improving processes to make people's lives easier.

It can also be understood as the art of transforming ideas and knowledge into new products, processes, or services that are significantly better than the existing ones and, above all so that they are valued or recognized by the market. It is a determining source of competitive advantages.

Four types of innovation are identified according to the final result: 1. product, 2. process, 3. marketing, and 4. organizational (OECD, 2018). The importance of innovation within organizations lies in the fact that it not only allows them to obtain or maintain a competitive advantage through the improvement or diversification of the processes or products offered but also to deal promptly with changes and threats arising in their environment (Teece, Pisano & Shuen, 1997; Teece, 2007).

From the perspective of evolutionary economics, there is a close relationship between innovation and development. Given the decline of a linear production system, where resources are increasingly scarce, incorporating innovation activities to migrate to a circular economy is a viable alternative for companies to remain in force. This new model seeks to produce efficiently, consider the environment, and reduce waste as much as possible through reuse, where waste is no longer waste and a resource, through changes in the production and supply chain (Imbernó & Souto, 2023).

In the case of air transport, there are two significant niches of opportunity for implementing the circular economy. The first refers to the aircraft production process, which includes design and research activities, production of parts and components, sub-assembly, final assembly, and after-sales activities (such as maintenance, repair, and operations services). The second area where the circular economy could be applied is in the operation of airports.

RESEARCH METHOD

The research is descriptive. First, a literature review was conducted in the Scopus database using the keywords "circular economy" and "aerospace industry." Fourteen results were obtained, which indicates that this topic needs to be studied more. However, it has been an emerging topic of study since the first papers were published in 2016.

Among the topics analyzed are new, lighter, and less polluting materials and the adoption of renewable energies such as ethanol. Emphasis is placed on the design of parts, components, and aircraft as a starting point for implementing the principles of a circular economy.

Due to the lack of publications, secondary sources of information, such as reports from non-governmental organizations and specialized agencies, were used. Two areas, aircraft, component production, and airport operation, were identified for applying the circular economy in the aerospace industry.

The aerospace industry has implemented design initiatives for circularity, emphasizing recycling, disassembly, improvement, and reuse. It has been observed that the components

and materials used by the industry can be reused by other sectors (such as furniture). The feasibility of these design processes in complex products, such as aircraft, requires attention to design for disassembly in the early stages of new product development (Rodrígues et al., 2022).

Production of aircraft and their components

As mentioned, the central axis in a circular economy model is to maintain the value of inputs and materials as long as possible through recycling and reuse, thus reducing the demand for natural resources. As shown in Figure 2, to obtain a final good, in this case, an aircraft, it is first necessary to obtain the raw material to transform into the parts and components needed for the final assembly.

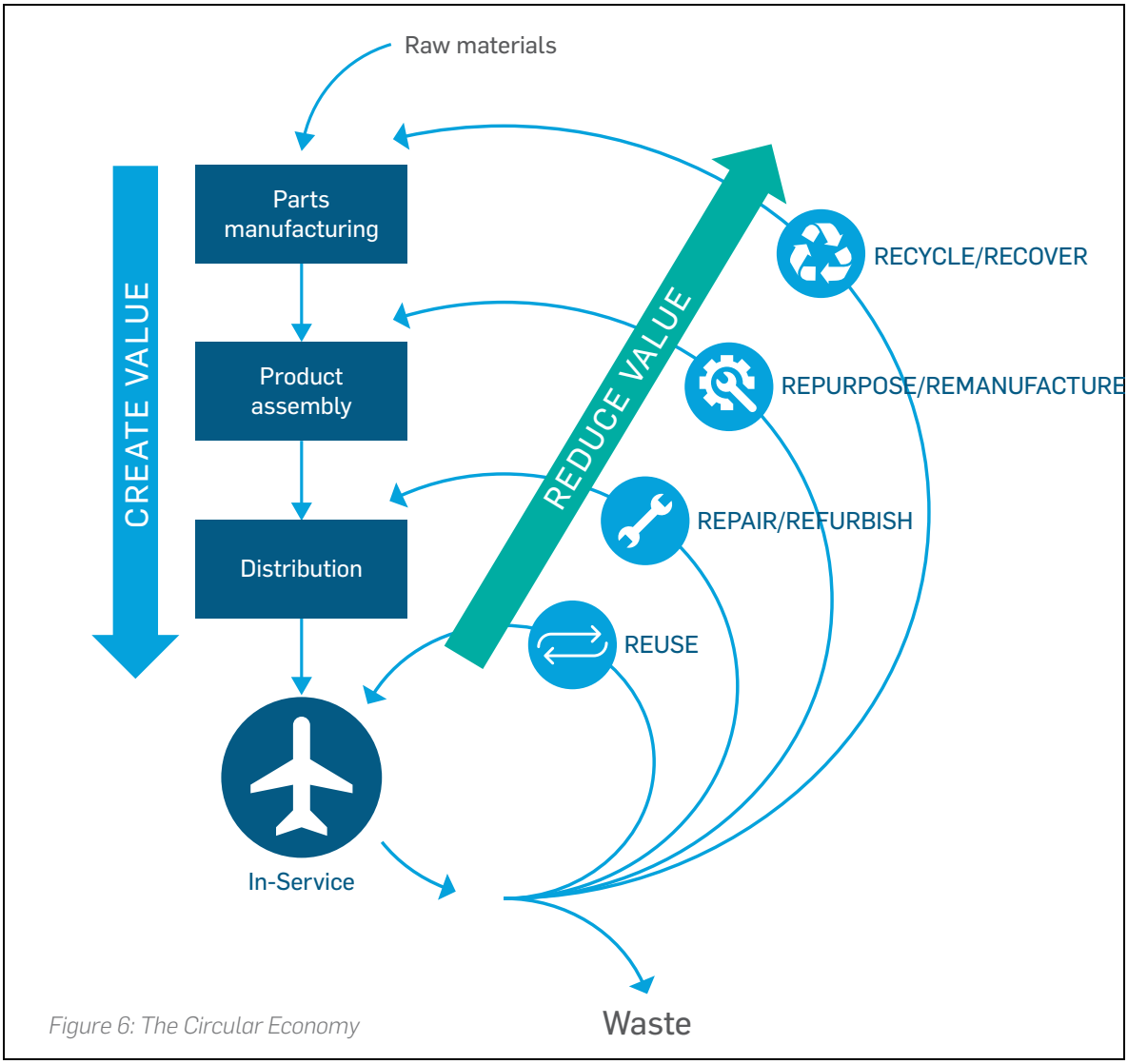
Maintenance and repair actions are necessary when an aircraft completes its life cycle (measured in flight hours) (Celikel, Rötger & Casas, 2022). In this process, parts and components are changed and discarded in the linear economy model, increasing the number of pollutants.

Under the circular economy model, parts and components are proposed to be recycled, repaired, and reused to avoid excessive waste generation. It also means profits for companies by reducing the costs of obtaining and transforming raw materials.

Figure 3 represents the production system of an aircraft, which starts with the extraction of raw materials necessary for the manufacture of parts and components. After being assembled, the aircraft is distributed and receives preventive and corrective maintenance during its useful life, which ranges between 25 and 30 years (Celikel, Rötger & Casas, 2022).

After this, the aircraft are scrapped and sent to aircraft graveyards. From the CE approach, from the design of the aircraft, the materials, and components used should be allowed to be repaired, reused, or remanufactured, either used in the same industry or in other sectors. Thus, it is intended to reduce the waste of aircraft and their components and use fewer natural resources. On the other hand, it is proposed that the lower the consumption of raw materials, the lower the costs for companies, the more competitive they will be. (Varaniute, Zickute & Vecerskiene; 2023)

Figure 3
Circular economy in the production of aircraft and aircraft components



Source: Domone et al. (2021).

However, in an industry highly dependent on technology and with high-quality standards, it is not easy to think that the migration towards a circular economy can occur without generating innovations and technological developments (Dwivedi, 2023). In this sense, some technologies that can contribute to the change in the production system were identified (see Table 1).

Table 1
Technological alternatives for a circular economy in air transport

Technology	Description	Application of the circular economy model in air transport
Additive manufacturing	They are state-of-the-art manufacturing processes, known as 3D printing, and have become popular as Rapid Prototyping tools. Currently, AM is classified as part of the Digital Manufacturing processes that have taken off with the so-called industrial revolution 4.0 and is one of the critical technologies. ASTM (American Society for Testing and Materials) proposed seven families that allow the identification of the technical principle under which each process works. These seven families are photopolymerization, powder bed fusion, binder injection, material injection, lamination, material extrusion, direct energy disposal, and hybrid.	Additive-manufactured metal parts are used in the aerospace industry for functional parts such as turbine blades, fuel injection systems, and blades. Optimizing parts can improve functionality and reduce weight. Lighter parts help reduce aircraft weight and, consequently, fuel consumption.
Digital twins	The virtual "Digital twins" model accurately reflects a physical object, process, or system. It is used to simulate and study the behavior of digital products precisely to adapt solutions to actual products efficiently.	Tests on engines and turbines. They can also be placed on operating aircraft to gather information to improve critical parts and components.
Artificial intelligence	AI is distinguished as a disruptive point of the "fourth industrial revolution"; it includes models, systems, and functions generally associated with human intelligence. Due to exponential data, AI can complement people's practices and expand their capabilities. Likewise, it allows human beings to learn faster from feedback, provides information to understand complex phenomena, and obtain benefits with less environmental and social impact.	We are designing circular products, components, and materials. AI can improve and accelerate the development of new products, components, and materials suitable for a circular economy through iterative machine learning (ML)-assisted design processes that enable rapid prototyping and testing. We are operating circular business models. AI can amplify the competitive strength of circular economy business models by combining real-time and historical data on products and users. Optimize circular infrastructure. AI can help build and improve the reverse logistics infrastructure needed to "close the loop" with products and materials by improving product sorting and disassembly, component remanufacturing, and material recycling processes.
Internet of things	Connected objects are capable of storing and connecting a huge amount of data that will later, thanks to increasingly complex software programs, be analyzed to return useful information.	Participation in the creation of smart cities, in the use of airports.

Source: Own elaboration (CIDESI, 2022; Domone et al., 2021; McKinsey Sustainability, 2019).

Developing fiber-reinforced polymers was also identified as a crucial enabler of lightweight, high-performance structures to increase efficiency in aviation (Bachmann et al., 2021). The

way the industry designs and recycles aircraft is being rethought to avoid downcycling and reduce dependence on the import of precious materials such as aluminum (Webb, 2023), as well as the extraction of materials defined as critical by the European Union, among which are lithium and cobalt, and which are indispensable for the disposal of internal combustion engines. Therefore, one solution to ensure access to these materials is to apply the principles of circular economy to recover them at the end of their useful life to guarantee the supply and reduce their environmental impact (Joensuu, 2023).

GROUND OPERATIONS, THE AIRPORTS

As mentioned, several proposals exist to implement circular economy principles in the design and construction of aircraft; however, 2% of the pollution generated by air transport originates in ground operations, i.e., airports. Against this backdrop, industry specialists have issued statements stating that "Aircraft are becoming more and more modern, and an airport owes its existence to its aircraft. Accordingly, the circular economy will take on a preponderant level within a few years in air terminals" (Pereira, 2022).

Airports generate wastewater, the treatment of which can generate methane, one of the leading greenhouse gases. In addition, air conditioning and lighting systems are used in the facilities, and waste is produced in restaurants and stores. In addition, the infrastructure is used for aviation. That is, "everything related to aircraft and runway maintenance, from accidental fuel spills to the use of oils or antifreeze or the pollution produced by the vehicles used" (Pereira, 2022).

Therefore, it is of utmost importance to implement actions to reduce airports' impact on the environment and the people living near them (Modarress, 2020). Table 2 shows some actions implemented in international airports that operate under the circular economy model.

Table 2

Actions to migrate towards a circular economy at airports

Airport	Implemented actions
Heathrow Airport, London	London's Heathrow Airport implemented actions to redeploy facilities and equipment and to dismantle them during modernization work. It has also designed the new terminal, which is part of the expansion program, as a covered space in which structures and buildings can be reorganized over time to respond to commercial, safety, and security changes. By using a standardized kit of parts for building construction that can be disassembled and reused multiple times in different configurations, the terminal can avoid the traditional demolitions associated with refurbishments.

Gatwick Airport, London	It invests in waste-to-energy, converting food scraps from flights and other types of organic waste into biomass fuel to provide heating for the North Terminal.
Indianapolis International Airport, United States	They are leaning towards using low-carbon pavements and are challenging the traditional methods and materials used in their runways and taxiways.
Amsterdam Schiphol Airport	They have improved their operational resource and waste management performance in response to circular economy thinking.
Vancouver International Airport	
Portland International Airport	
Queenstown Airport	

Source: Own elaboration (Danson, 2023).

Other initiatives for airports to operate in a circular economy model include energy efficiency and greater control of aircraft take-off and landing, which will reduce emissions produced while the aircraft is on the ground.

CONCLUSIONS

Although the idea of using a production system based on the principles of circular economy has presented a more significant interest by governments, industry, and academia, being seen as an alternative to achieve environmental sustainability, little has been published on its relationship with air transportation, so the objective of this work was to identify innovations, technological developments and best practices to migrate towards a circular economy in air transportation and allow stakeholders to remain competitive in an industry that operates under the global value chain scheme.

For the aviation sector, the circular economy is an emerging concept. Although its application has yet to be widespread, using circular economy strategies can offer valuable learning opportunities for the future. Aviation is a sector expecting substantial growth, with annual global air traffic expected to double by 2035 (ICAO, 2022), with an average annual growth rate of 4.4%. According to Boeing and Airbus, the projection of new aircraft delivered by 2034 would be 38,050 and 32,585, respectively. (Boeing, 2019; Airbus, 2018)

All estimates indicate a potential increase in global aviation resource consumption, waste, and emissions generation (Celikel, Rötger & Casas, 2022). Transitioning from the linear economy to the circular economy could help reduce adverse environmental impacts and associated economic costs.

The analysis highlights the need to develop and use alternative fuels, and it is also identified that circular economy practices depend on product designs. Migrating towards a circular economy is a complex task since different stakeholders with particular functions participate in aviation, including aircraft designers and assemblers, who must emphasize using parts and

components that can be reused, which would imply a significant change in its supply chain. (Hartley, Baldassarre & Kirchherr, 2023)

The primary users of aircraft are the airlines, which must implement improvements in energy consumption and waste management. As for airports, an important part is energy use and waste management, the administration of arrivals and departures, and the appropriate infrastructure that allows water to be reused, or better yet, ventilation systems without contaminating.

Due to those mentioned earlier, it is proposed that managers within organizations prepare for these changes. Adopting or developing new technologies and implementing novel practices can support this transition by promoting the continuous reuse of materials to minimize waste and the demand for additional natural resource consumption.

In general, transitions towards sustainability usually involve social, organizational, and regulatory changes and changes in consumer habits, among other things. However, these transitions usually come with technological innovations and developments. In the case of aviation, technologies such as additive manufacturing, the use of digital twins, the Internet of Things, and artificial intelligence are considered mechanisms that contribute to this transition.

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Artisanal Businesses: Historical and Economic Context

Empresas artesanales: contexto histórico y económico

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ABSTRACT

This paper aims to examine the unique features of artisan enterprises in Ecuador and how cooperation programs and national peculiarities have influenced their development. Through descriptive and conceptual analysis, we can better understand how these organizations have evolved within the historical and economic context of rural regions in Ecuador. The primary findings suggest that poverty alleviation and control measures have significantly impacted the definition of artisan enterprises in Ecuador, which now closely resemble micro-enterprises. Development cooperation efforts in Ecuador have prioritized preserving artisanal production rather than replacing it with industrial production, promoting micro-enterprises growth as artisanal workshops.

Keywords: international cooperation, micro-enterprise, artisanal enterprise, taxation, business, competitiveness.

JEL code: R11, O23, O50

RESUMEN

Este artículo tiene como objetivo examinar las características únicas de las empresas artesanales en Ecuador y cómo los programas de cooperación y las peculiaridades nacionales han influido en su desarrollo. A través del análisis descriptivo y conceptual, podemos comprender mejor cómo han evolucionado estas organizaciones dentro del contexto histórico y económico de las regiones rurales del Ecuador. Los principales hallazgos sugieren que las medidas de control y alivio de la pobreza han impactado significativamente la definición de empresas artesanales en Ecuador, que ahora se parecen mucho a las microempresas. Los esfuerzos de cooperación al desarrollo en Ecuador han priorizado preservar la producción artesanal en lugar de reemplazarla con producción industrial, promoviendo el crecimiento de microempresas como talleres artesanales.

Palabras clave: Cooperación internacional, microempresa, empresa artesanal, tributación, negocios, competitividad.

Código JEL: R11, O23, O50

INTRODUCTION

International cooperation aimed at developing countries has not yielded the same positive results as in Europe during the post-war reconstruction period (Durán & Balestro, 2023; Sauvant & Hasenpflug, 2019; Fischer & Thomas, 1995; Higgins, 1992). Developing countries face problems such as deep-rooted historical issues, significant structural differences, and internal disarticulation. They also have unequal external dependencies and often carry a substantial external debt that causes them to contribute net resources to developed countries (Bresser & Oreiro, 2023; Ulcuango et al., 2021; Hopenhayn & Rojo, 1990; Marshall, 1986).

The Republic of Ecuador has been receiving development cooperation programs, but the country's overall condition still needs improvement. Although the right environment for Foreign Direct Investment has been maintained, it has not directly impacted poverty reduction or improved the standard of living for the population as a whole (Emako et al., 2023). However, it is worth noting that poverty would have been worse without these programs. The Ecuadorian business structure still reflects colonial traits and artisanal work is more prevalent than industrial work (Ayala, 2008; Contreras, 1990). This situation has led to confusion between artisanal and non-artisanal economic units.

The artisanal sector is experiencing weakness and needs more information on its requirements and priorities for technical assistance, product promotion, and training. In today's times, competitiveness is limited (Narvaez, 2004). Support programs and tax exemptions add to the confusion. Micro-enterprises require clear guidance regarding artisan workshops or artisans. This situation is of no concern as long as it facilitates the creation of jobs and a secure income for the most vulnerable, especially during economic instability. In other words, the main objective of the support programs for artisanal activity in the Republic of Ecuador is to guarantee an income to the most vulnerable members of the population in addition to the conservation of cultural heritage expressed in the creation of crafts (McGowan, 2021; Yang et al., 2018). At this point, it is crucial to indicate that for countries like Ecuador, the path towards industrialization in pursuit of development becomes impossible since it would mean losing the cultural wealth that it represents.

Moreover, the cost to the population in terms of poverty would be high. Programs aimed at transforming the Ecuadorian business fabric through assimilation and technology transfer have yet to yield favorable results (Quezada et al., 2018). These programs have only allowed enterprises to survive for generations, not their transformation (Flor et al., 2018).

This article aims to analyze the characteristics of Ecuadorian artisanal enterprises and the benefits of development cooperation. Additionally, it examines the fiscal incentives of these enterprises while indicating their positive and negative aspects. The article also outlines the limitations and the scope of recent institutional lines of action. The approach to this work is descriptive and conceptual but with a critical focus on the role of Ecuador's artisanal enterprise and the measures being promoted to improve it.

The article is divided into three parts. The first deals with development cooperation aimed at Ecuador, which preserves artisanal work without favoring the industrialization of local businesses in its efforts to reduce inequality and alleviate poverty. The second part analyses artisanal enterprises in recent years, the fiscal incentives that have contributed to preserving artisanal activity, and the confusion of artisanal workshops and artisans with micro-enterprises. Finally, the paper outlines the main environmental characteristics of the Ecuadorian definition of an artisan enterprise. This definition derives the implications of merging a microenterprise and an artisan workshop.

DEVELOPMENT COOPERATION IN ECUADOR: INEQUALITY AND POVERTY REDUCTION

Development economics emerged during the Cold War. Its objective was to transfer the experiences of advanced industrial countries to relatively backward countries; the term economic growth became synonymous with development. Nowadays, it implies the goal of reaching the current state of advanced capitalism (Malgesini, 1997).

Smaller enterprises with incipient technology and artisanal transformation processes characterize a lower degree of capitalism. These enterprises are expected to act locally and focus on satisfying the population's basic needs (Fajnzylber, 1976). These localities have highly diversified, labor-intensive activities with no market leaders, high production costs, and a lack of capacity to compete with imports from industrialized countries. This type of economy, of which Ecuador is no exception, requires high protectionism to survive in the long term, which makes it unsustainable.

Therefore, providing financial and technical support to less developed countries is crucial. Financial and technical assistance involves sharing fundamental technology, capital, and knowledge to foster growth and development (Malgesini, 1997). This type of cooperation requires significant funds that the recipient nations still need to repay. As a result, this form of aid was primarily restricted to "first-generation" agreements aimed at countries with lower levels of development. The proposal for this aid was based on the gradual technological transformation of the productive system, with a close connection to foreign companies that would make the international market the ultimate destination for products and services.

Financial and technical cooperation aimed at developing the rural sector, improving food security, and improving the economic, legal, and social environment for the private sector. The financial and technical cooperation included support for smaller enterprises, protection of the environment, particularly tropical forests, and projects related to democracy, efficient and fair public administration, human rights, and the fight against drugs, among other things. (Conde & Hurtado, 2000).

In the last century, a formal approach to financial and technical cooperation has been proposed and remains unchanged. This approach presents a very ambitious picture. Recipient countries prioritize only those elements that facilitate the stability required for Foreign Direct Investment.

Global crises, external debt burdens, and climate change challenges have forced countries to sacrifice local economic development to maintain macroeconomic stability (ECLAC, 2022). Therefore, it is crucial to enhance efforts to achieve better outcomes related to poverty reduction, diminishing inequalities, and creating innovative environments that promote international competitiveness.

Ecuador and other countries have faced challenges, and while international cooperation has helped mitigate negative impacts, it has also reduced their political freedom and autonomy to address their priority problems (Barberis, 2003). One approach is decentralizing aid distribution to increase Ecuador's autonomy despite its international commitments.

Over the last decade, Ecuador has faced various challenges balancing poverty alleviation and industrialization. Unfortunately, there have been limited alternatives available to the government. The decline in metal and mineral prices starting from 2011 and the collapse in crude oil during 2014-2015 have significantly impacted the government's revenue. However, Ecuador has responded with tax reforms and other measures that have resulted in over one percentage point increase in revenue collection. According to the Economic Commission for Latin America and the Caribbean (ECLAC, 2020), this information is available.

In recent decades, Ecuador's growth strategy brought about significant social progress. However, this progress was accompanied by macroeconomic imbalances due to the country's dollarized economy and the fall in oil prices, as indicated by the World Bank (2019). To address this, the World Bank proposed measures to increase the efficiency of public investment and fiscal consolidation while protecting vulnerable groups through targeted social programs. With the outbreak of the pandemic, Ecuador released additional funds to strengthen social safety nets and increase support for people living with HIV and AIDS. The government also provided extraordinary and temporary monthly bonuses ranging from USD

40 to 345 for the most vulnerable households. The Banco del Instituto Ecuatoriano de Seguridad Social (BIESS) also provided soft loans for the elderly. These efforts were reported by ECLAC (2020).

Ecuador borrowed a total of USD 1.987 billion from various multilateral financing institutions to help alleviate the effects of the COVID-19 pandemic. In May 2020, the IMF granted it USD 643 million, the World Bank provided a loan of USD 500 million to strengthen its health system through the COVID-19 Fast-Track Facility, and the Inter-American Development Bank made available USD 2 billion to contain the effects of the pandemic for USD 794 million. The Development Bank of Latin America (CAF) also granted USD 50 million (ECLAC, 2020). However, the aid was received when poverty alleviation was a priority, and the country needed more trained personnel to manage it. Since 2008, the management of international cooperation has been the exclusive responsibility of Autonomous decentralized governments rather than the central government (Monje, 2014).

Decentralized governments have benefitted primarily from cooperation with multilateral organizations, NGOs, or private entities (Monje, 2014). However, the decentralized autonomous governments in Ecuador - mainly municipal and parish governments - require additional tools, specialized units within their organizational structure, and trained personnel to effectively manage and fulfill their responsibilities in receiving international cooperation (Monje, 2014).

It has been reported that the decrease in oil prices and the COVID-19 pandemic have hindered social progress for several years, as stated by ECLAC in 2021. Ecuador faces four significant challenges, according to the World Bank's report (WB, 2019). Firstly, 60% of the country's poor population resides in rural areas. Secondly, more than 250,000 Venezuelans have migrated to Ecuador. Thirdly, social development issues disproportionately affect women and ethnic minorities. Lastly, the country faces high exposure to natural disasters and the adverse impacts of climate change, as per the World Bank's report in 2019.

In 2020, the impact of the health crisis was felt significantly in the job market. It resulted in a significant increase in precarious and informal employment and further widened the existing gender gaps. In less than a year, the pandemic undid the progress made in the social sphere over the previous decade, as reported by ECLAC (2021). Artisanal activities become crucial in addressing poverty and inequality in such a scenario.

THE ROLE OF ARTISANAL ACTIVITY IN ECUADOR IN THE FACE OF INEQUALITY AND POVERTY

Artisanal activity has been appreciated and recognized as the primary mechanism for coping with difficult times in Ecuador's economic history. For this reason, the government created institutions, norms, and support programs to encourage craft training in the community and link it to work. It even incorporated artisans as workshop teachers into the training and certification process (JNDA, 2021). For this nation, the work of the artisan is art. "Craftsmanship is not just the manual production of objects of practical or decorative utility. It is much more than that. It is part of our culture" (PRE, 2022).

The National Board for the Defence of Artisans has identified 186 branches of activity that are maintained by tradition or family inheritance and passed on from parents to children. The most significant risk is that the transmission of craft knowledge will be interrupted, thus causing the loss of valuable ancestral knowledge and techniques (PRE, 2022). Poverty alleviation merges with cultural heritage conservation. In the words of Bravo (2020: p.35):

> *"The artisan's activity is a symbiosis that combines production with an ideological charge. In other words, they are ambassadors of knowledge and traditions, part of the cultural ecosystem of a country. Their hands create culture, and their voice conveys history and identity".*

In this perspective, the National Board for the Defence of Artisans identified 186 activity branches maintained by tradition or family inheritance and passed down from parents to children. The most significant risk for the nation is that the transmission of craft knowledge will be interrupted, thus losing valuable ancestral knowledge and techniques (PRE, 2022). It is how Ecuador is divided between the preservation of crafts and the industrialization of its activities. In Ecuador, this action is seen as positive for the socio-economic context. Contradictorily, they seek greater competitiveness through artisanal activity. They believe that artisans can be competitive if they adapt their activities to changes in the economic, productive, and service environment (JNDA, 2021).

The government aims for artisans to be aware of their capacities and potential, training them to self-manage and generate projects to improve the different branches of artisan work. Preparing artisans to be aware of the socio-economic importance of their activity in the Ecuadorian economy is considered a key factor. Values such as solidarity, cooperation, conservation of natural resources, and environmental respect are also relevant for training competitive artisans (JNDA, 2021).

The management of external aid seeks greater competitiveness in artisanal activity (JNDA, 2021). It needs to be clarified because competitiveness is achieved with low costs and technological innovation in production processes (Dosi et al., 2015; Chursin et al., 2016).

On the other hand, Narváez (2004), in his study on the Ecuadorian handicraft sector, makes the following points: It occupies a privileged place in the history of Ecuador for being the first to produce products, not only for self-consumption but also for export. It also serves as a means of survival for Ecuadorians in both urban and rural areas in the absence of jobs in industry. However, there is no study on the requirements and priorities for technical assistance, product promotion, and training; furthermore, it has demonstrated its limited capacity to be competitive, being a weak sector with limited capacity to influence state policies.

Any economic survival unit is profiled as artisanal. It only needs to be made up of family members of a smaller size or lacking specialized technology to be qualified as such. It contradicts what the Ecuadorian government has declared and what multilateral organizations propose. The explanation for this confusion can be found in the fiscal measures created to maintain macroeconomic equilibrium.

HISTORY OF THE ECUADORIAN HANDICRAFT COMPANY

Artisan workshops for the free market are considered smaller enterprises. Artisans who export or receive government support register their workshops as economic units (enterprises). Such registration does not industrialize the work done in the workshops; instead, they maintain the traditional mode of production while inserting themselves into the global economy (González & Córdova, 2020). Therefore, drawing on history and culture is vital to understanding what happens in Ecuador's artisanal workshops (artisanal enterprises).

Crafts is a labor-intensive activity, so any sector promotion quickly becomes an employment strategy, particularly in large areas of Ecuador. In Ecuador, there are settlements whose population is entirely linked to the handicraft sector (Cuvi, 1985). There is no place in the Republic of Ecuador without handicraft products and manifestations of famous art (Cuvi, 1985). As Cuvi (1985) puts it, in the times of

> *[...] pre-Inca, in the weavers of fine clothes for the Inca and his family, in the farm workshop and among the peasantry, is where the first groups of rural artisans were born.*

During colonial times until the beginning of the 18th century, textile production in the Royal Court of Quito fed demand in Peru, Colombia, Panama, and Chile. Even when the farm workshops were closed due to the importation of European textiles, the small artisan workshops in the Ecuadorian regions of Otavalo Cuenca and Loja continued to produce textiles for the domestic market and export to neighboring countries (Cuvi, 1985).

Urban crafts began with the arrival of Spanish artisans in colonial times (Cuvi, 1985). Therefore, urban crafts were under the strict supervision and control of the Church and the Cabildo. The workshops then were organized around guilds produced for the elites, that is, for the nobles who lived in the cities of the Royal Court of Quito. With independence, the control that the Cabildo and the church exercised over the guilds disappeared. Hence, the city artisans founded their unions and societies to defend their interests and improve their socio-economic situation (Cuvi, 1985).

One of the main characteristics of craft enterprises is how the leading artisan acquires the trade. Most learn this activity through generational transmission in the family nucleus (Sánchez & Torres, 2020). The production process is passed on from generation to generation, managing to maintain the cultural value. It is a second qualitative characteristic of the artisan enterprise and does not necessarily qualify it as a family business (González & Córdova, 2020; Li, 2022).

Not all smaller firms are family firms (Romero, 2006; García et al., 2019), nor are all family firms smaller (Miller & Le, 2005; Randolph et al., 2019; Ge et al., 2022). Likewise, not all craft enterprises are necessarily family businesses, despite the transmission of craft knowledge within the family nucleus. In the Republic of Ecuador, artisan workshops are considered artisan enterprises; however, other enterprises are not necessarily considered artisan enterprises.

Craft workshops are part of the business units that enable the most vulnerable groups to survive. Without being artisanal workshops, these units are also registered as artisanal enterprises. Ecuador's priority is to alleviate poverty while maintaining macroeconomic equilibrium; more is needed to restrict programs to companies that are artisanal workshops. The cost of controlling and eliminating non-craft enterprises from these programs would be an impossible burden to bear.

Thus, fiscal mechanisms and development aid in this context have blurred the line between the artisanal enterprise and other forms of enterprises and economic activities (STGISP, 2022), with the Ecuadorian artisanal enterprise being synonymous with "trader," "SME," or "Entrepreneur." At the same time, there is indeed a regulatory context in Ecuador that formally defines it.

CHARACTERISATION OF CRAFT ENTERPRISES IN ECUADOR

The definition of the artisanal sector in Ecuador leads to divergent positions due to its high heterogeneity. The group's economic, social, and lifestyle differences outweigh the similarities. In Ecuador, the artisan enjoys labor, tax, and financial benefits, encouraging the population to obtain this profile (Covi, 1985).

In addition, they can receive support from development cooperation programs and benefit from a lower tax burden. Table 1 shows the tax status of companies in Ecuador that are registered for tax facilities, which form part of the statistics. National. Support from tax, credit, and accreditation programs encourages formality.

Ecuador includes service crafts in addition to handicraft producers. These services include vehicle repairs, household appliances, plumbers, painters, beauty salons, food and catering services, and photographers, to name a few examples (Cuvi, 1985). Table 1 shows the companies registered in 2021 and indicates their situation.

Table 1
Conformation of the Statistical Register of Enterprises 2022 by condition.

. **Situation**	**N.**	**%**
a. Companies whose income does not exceed the tax base are not required to declare income tax in the SRI.	461.810	53,47
b. Companies that declared taxes under RISE 2021; They did not declare sales in 2021 nor register employment positions in 2022 (Simplified System).	335.712	38,87
c. 2021 sales and registered employment positions 2022 productive activities.	48.052	5,56
d. Companies that only record 2021 sales. They are micro and small businesses, sole proprietorships, or family businesses with irregular income flow.	15.814	1,83
e. 2021 sales and 2022 registered employment positions in non-productive activities.	2.293	0,27
Total	**863.681**	**100**
Note: As of 2022, the SRI decided to create the Simplified Regime for Entrepreneurs and Popular Businesses (RIMPE), which still needs to be included in the statistical reports.		

Source: INEC (2023).

Despite their importance, no statistical data allow us to isolate craft enterprises from other types of enterprises in Ecuador because the artisanal process is a qualitative element that can be present in creating and marketing a product or service. For this reason, the use of statistical data entails the analysis of smaller enterprises. The quantitative criteria for classifying enterprises in Ecuador are sales and number of employees. Table 2 shows the range for each company size.

Table 2
Criteria to classify the company by size in Ecuador.

Size	Sales	Workers
Large	> $5´000.000	≥ 200
Medium B	From $2´000.001 to $5´000.000	From 100 to 199
Medium A	From $1´000.001 to $2´000.000	From 50 to 99
Small	From $100.001 to $1´000.000	From 10 to 49
Micro	≤ $100.000	From 1 to 9
Note: On a provisional basis, the company size is defined according to the reported annual sales volume in 2021 and the number of affiliated persons either at the level of registered employment or employment registered in social security, reported in 2022. For its determination, the criterion of annual sales volume prevails over the criterion of affiliated personnel. Only for public institutions will employed personnel be considered first, and sales volume will be second.		

Source: INEC (2023).

Not all smaller enterprises are entrepreneurial workshops, but a large enterprise could hardly be considered artisanal unless it is a cooperative made up of multiple craft workshops. Studying the craft enterprise requires differentiating between quantitative and qualitative aspects so as not to confuse it with another type of enterprise (González, 2005).

Although challenging, medium-sized enterprises may be qualitatively placed in the craft workshop model. Therefore, most entrepreneurial workshops can be held in small and micro-enterprise groups. So, qualitatively, they are artisan workshops and have a labor-intensive process. However, quantitatively, they are placed among the micro and small enterprises rather than among the medium and large ones. However, in the case of Ecuador, the definition of "artisanal service" for activities such as plumbing, car repairs, or beauty salons opens the door to confusion between artisanal enterprises and any other form of enterprise. In this situation, the microenterprise is highly merged with the artisanal enterprise.

Thus, all craft enterprises in Ecuador are smaller enterprises. They are primarily microenterprises and, in some cases, small enterprises. Their legal conception also blurs the line between artisan enterprise and microenterprise. The Law for the Defence of Artisans in Article 2, Paragraph B defines artisans as follows:

> *"[...] a manual worker, workshop master or self-employed artisan who, duly qualified by the National Board for the Defence of Artisans and registered with the Ministry of Labour and Human Resources, carries out his activity and work personally and has invested in his workshop, in work implements, machinery, and raw materials, an amount not exceeding twenty-five percent (25%) of the capital set for small industry. Likewise, a manual worker is considered an artisan, even if he has yet to invest in work implements or lacks workers [...]* (Law for the Defence of Artisans, 1997).

This law determines that the artisanal enterprise must be small or micro. It is indicated by the following phrases: "has invested in its workshop [...] an amount not exceeding twenty-five

percent (25%) of the capital fixed for the small industry", or "the manual worker, even if it has not invested any amount in work implements or lacks workers."

According to the Law for the Defence of Artisans, if an artisan has no assistants, "no operators," but keeps a record of his economic activities with the government, then his workshop is included in the databases and official statistics as a microenterprise, even if it is just him. The artisan then registers as a manual worker and statistically is a microenterprise with only one employee. It leads to merging the concept of microenterprise with the concept of workshop or craft enterprise. Thus, in Ecuadorian practice, both organizations are treated synonymously.

At first glance, considering a microenterprise with only one employee is a principle of inclusion, particularly when in other regions, microenterprises are only considered to have two or three employees or more. However, this further contributes to the failure to differentiate the artisan from the non-artisan.

The Republic of Ecuador's approach is inclusive. Artisans have a cultural added value in their profession that may be more important at a given moment than the productive one.
In the words of Bravo (2020):

> *"The artisan's activity is a symbiosis that combines production with an ideological charge. In other words, they are ambassadors of knowledge and traditions, part of the cultural ecosystem of a country. Their hands create culture, and their voice conveys history and identity".*

Under this idea, microenterprises merged with artisans and craft workshops, and the enterprise structure and contribution to employment can be analyzed for each size of the enterprise in the last two years (Table 3).

Table 3
Number of enterprises and employment places by size of enterprise in Ecuador

	Large	Medium A	Medium B	Small	Micro
Number of companies 2021	4.400	6.000	4.200	37,700	797,600
Number of companies 2022	4.400	6.100	4.200	38.300	810.700
Job vacancies 2021	1.178.891	216.018	198.916	417.830	686.996
Job vacancies 2022	1.233.609	221.286	208.993	439.390	711.772
Variation percentage	4,6	2,4	5,1	5,2	3,6

Source: INEC (2023)

According to statistical data, large enterprises contribute more job vacancies in the country than others.

However, when adding the number of jobs provided by micro and small enterprises, the number of jobs provided by both sizes of enterprises is almost similar to that of large enterprises. Therefore, the participation of artisanal organizations in generating and

preserving jobs in the country is almost the same as that of large enterprises. Employment, which very small enterprises statistically represent, is as meaningful as the sources of employment provided by large enterprises.

It leads us to consider once again what was discussed in the first section: if the main objective of the programs derived from business cooperation for Ecuador, and which have supported artisan enterprises, has been the conservation and creation of jobs that protect the most vulnerable population, then there is no need to be more specific and try to separate micro-enterprises from artisan enterprises. There is no need to discriminate against smaller enterprises that claim to be artisans without necessarily being so. Discrimination does take place in larger, more industrialized countries. These companies fulfill the primary objective of ensuring gainful employment and thus reducing poverty. From this perspective, whether they are artisanal or not makes no difference. In Ecuador, artisanal enterprises are legally limited to a micro or small size. Can micro-enterprises play an essential role in the extinction of entrepreneurial workshops? Can marketing and services play a more significant role than handicraft production? How can we ensure that a company with handicraft production is not seduced into marketing industrialized products? In a free market environment, the incentive to make more profit by buying and selling imports than by producing is a global reality. Blurring the line between entrepreneurial workshops and other microenterprises may bring the high cost of moving from artisanal to commercialization. It would also lead to greater dependence on the outside (consuming more than one produces) and further divert from the path toward industrialization. The statistics do not indicate whether this is already happening in Ecuador, but it is an inherent risk.

PROGRAMMES AND ACTIONS IN FAVOUR OF ECUADORIAN CRAFT ENTERPRISES

Due to the high percentage of microenterprises, Ecuador has seen an increase in entrepreneurship and the development of initiatives to support it. In April 2019, the central government launched the "Entrepreneurship Ecosystem" program, which provides resources and tools to entrepreneurs to strengthen and promote local businesses. It complements the "Ruta de la Transformación Productiva" plan, created in 2018, which grants tax benefits and guarantees to companies. This plan promotes job creation, increases competitiveness, and improves productivity.

The Ecuadorian Federation of Chambers of Commerce and the National Association of Private Enterprises supports businesses by organizing workshops and training courses. They also offer mentoring programs to help entrepreneurs make better business decisions. Artisanal entrepreneurs are an essential part of the Ecuadorian economy, so government

programs are geared towards providing training and technical assistance resources that help them become more efficient and promote their products through digital platforms and trade markets nationally and internationally.

To be a qualified artisan, one must have completed compulsory primary education, the workshop must be qualified, the owner must be in charge of it, and the activity must be artisanal. The capital invested must be at most 25% of the capital set for a small industry, i.e., US $ 87,500, and the number of employees can be at most ten employees and five apprentices (JNDA, 2021).

The JNDA (2021) grants the "artisanal" qualification. This qualification is valid for five years. In the case of self-employed artisans, the validity period is one year, after which they must take an artisan training course to be able to renew their credentials. By law, both groups enjoy employment, financial, and tax benefits.

Employment benefits

The Labour Code exempts qualified artisans from paying labor benefits to their employees, except social security payments, for which they do not enjoy preferential treatment. It leads to lower production costs for craft enterprises. In addition, it becomes a mechanism to curb informality, as the artisanal enterprise keeps labor relations registered and formalized with the government.

Banking Benefits

Artisans can access credit facilities to expand their businesses and acquire new supplies. BanEcuador is a financial institution that offers options designed for qualified artisans, for example, loans for the purchase of fixed assets and productive loans, with installments adapted to the income flow of the artisans, with grace periods, if considered appropriate, and an interest rate of 11.25%, with amounts ranging from $50.00 to $ 20,000.00 with personal guarantees and higher amounts with real estate or pledge guarantees.

In addition, the government created several programs to provide financial support and resources to artisans. These initiatives are also designed to increase artisans' access to credit. The aim is for businesses to grow, allowing them to create more products and become more financially independent.

With greater access to credit, Ecuadorian artisans can expand their reach, create better opportunities for themselves, and contribute more to the economy. By supporting them with financing options tailored specifically to their needs, they can increase their profitability and create a more sustainable livelihood. This situation, in turn, benefits the artisans and the economy as a whole.

One of these initiatives is the 1x30 credit program, which offers loans ranging from $500.00 to $5,000.00 with a term of up to 30 years at a preferential interest rate of 1% per annum, with monthly payments (up to 360). This program aims to support Ecuador's artisans with access to credit to help lay the groundwork for improving the standard of living of many of its citizens while strengthening their cultural heritage and promoting the country's economic growth.

Tax benefits

Artisan products are exempt from paying Value Added Tax (VAT) in Ecuador. Instead of paying a portion of their profits to the government, they can use that money to reinvest in their business, buy supplies and materials, or even save, giving the artisan more creative control over their products (Dorling, 2016).

While it is true that having a 0% tax rate facilitates the invoicing and tax declaration process for artisans, who, in some cases, due to their rusticity and other cultural aspects, find it complicated to understand the tax issue, it is also true that it benefits the end consumer, who purchases the product for a lower value, thus compensating for the advantage that large companies have over smaller ones in terms of costs. It is also true that it benefits the final consumer, who purchases the product for a lower value, thus compensating for large companies' advantage over smaller ones in terms of costs.

Tariff exemption for importing specialized machinery and materials that are unavailable locally allows them to improve their production efficiency and quality (Khan et al., 2021). This exemption also provides access to diversified raw materials that widen the scope of their production. This strategy seeks to allow artisans to explore creative possibilities and promote innovation without compromising the authenticity of their creations (Sandry, 2017).

As of 2022, 79% of companies in Ecuador belong to the micro-enterprise regime. As of August 2022, electronic invoicing[1] became mandatory for persons subject to this regime. Artisans are placed in the micro-enterprise or general regime.

Ecuador's tax situation is complex. The country recorded high rates of tax evasion[2]. This non-compliance resulted in estimated losses of between 7.4 billion annually to the government, and the tax evasion rate among individuals was 58.1% (Gómez & Moran, 2020).

[1] The progressive incorporation of the electronic invoicing regime is a structural measure of the systems' scope, including digitalizing tax administrations. The electronic invoice is a mechanism similar to the tax receipts that taxpayers must send, but with the particularity that it is done electronically, and the information is received automatically (González et al., 2019).

[2] Def. It is taxpayers' total or partial failure to declare and pay their tax obligations. However, it can also be defined as the act of not declaring and paying a tax that contradicts the law through the illegal reduction of taxes. Through deceptive maneuvers (González et al., 2019).

Ecuador took steps to improve its tax system[3]. In 2015, a law was passed to combat tax evasion, including increasing penalties for tax evasion and strengthening the government's capacity to monitor taxpayer compliance (ECLAC, 2020).

Electronic invoices can be easily transmitted between parties via email or other digital communication channels, eliminating the need to file or store paper documents manually. All these characteristics make electronic invoicing an invaluable tool in the fight against tax evasion. Between 2016 and 2017, through the SRI, 810 ghost companies were detected that generated damage to the Republic of Ecuador for approximately 835 million dollars, with false invoices delivered to 19,890 customers. (González et al., 2019).

The Microenterprise Tax Regime, or RIMPE, is compulsory for all natural and legal persons whose annual income is USD 300,000 or less and whose number of employees does not exceed nine. The income amount prevails over the number of employees.

This regime was introduced in September 2020 amid the COVID-19 pandemic and taxes two percent of taxpayers' total income. It aims to reduce taxpayers' formal obligations, reducing the 48 annual obligations to just eight.

In addition to streamlining and simplifying taxpayers' tax contributions, having a fixed income rate avoids the burden and operational overload of calculating income tax. However, this regime has received negative criticism from taxpayers and chambers of commerce, who have seen it as a burden on taxpayers' liquidity since they must pay two percent of their income regardless of the results obtained in commercial operations.

ON THE MICRO-ENTERPRISE REGIME AND TAXATION: IMPACT ON CRAFT BUSINESSES

[3] In Ecuador, in strict application of article 226 of the Constitution24, the Internal Revenue Service (SRI) has signed inter-institutional cooperation agreements with the State Attorney General's Office, the Ministry of the Interior, and the National Customs Service, which have allowed the exchange of information to combat and punish tax crimes. Additionally, the SRI participates in the Global Transparency Forum, which allows information exchange with more than 100 countries. On the other hand, the country has obtained information from the State Attorney General's Office to unravel plots of aggressive tax planning and tax evasion. Finally, also to combat customs and tax crimes, the Specialized Unit to Fight Tax and Customs Crimes was created in this country, which is in charge precisely of the crossing and exchange of information, cooperation processes, training, and support (González et al., 2019; Gómez & Morán 2020)

However, the objective of the Microenterprise Regime (RIMPE) is to reduce tax evasion, hence the obligation of electronic invoicing for all persons subject to this regime. Other taxpayers excluded from this regime are those belonging to the RISE or the Popular and Solidarity Economy organizations, public companies, NGOs, and those working exclusively in free labor, providing professional services, supplying fuel, and exploiting natural resources.

At its core, Ecuador's microenterprise regime works to reduce the tax burden and simplify administrative procedures for a tiny sector, shifting that burden and increasing administrative processes to the most vulnerable, in this case, companies whose profits are below $51,141.77 per year.

The Simplified Tax Regime of Ecuador, or RISE, is another measure that was adopted in 2007 when the "Tax Equity Law" came into force, which aims to reduce informality and promote the legalization of Ecuadorian micro and small businesses by promoting tax culture through campaigns and programs that encourage the payment of taxes. However, on 01 January 2022, it was replaced by the Simplified Regime for Entrepreneurs and Popular Businesses RIMPE (SRI, 2022).

This program was aimed at sole proprietorships engaged in retail trade, food preparation, self-employment, animal husbandry, and mining, among others. It was for enterprises with less than ten employees whose annual revenues are at most $60,000.

However, these measures have not combated informality. In 2018, ECLAC estimated that 72.6% of Ecuadorians did not have a legal contract, nor did they contribute to the Ecuadorian Social Security Institute IESS (Arias et al., 2020), while according to the Ecuadorian Institute of Statistics and Census INEC in December 2021 the rate of informal employment was 49.9%.

In addition, natural persons who carry out any economic activity must register in the Unified Taxpayers' Register, RUC1, issue and submit sales receipts authorized by the SRI for all their transactions, and file tax returns on their economic activity. They must also notify the SRI of their income and expenditures, thus establishing the tax to be paid.

The single tax register is unique and unrepeatable. In addition to being used in tax procedures, it is also used as a population register, which allows it to be used for different procedures and operations, both with public institutions and private organizations (González et al., 2019).

Programs leading to the registration of natural persons and sole proprietorships, such as the RUC, are mechanisms to reduce informality, from which artisans are not exempt.

Informality, tax evasion, and international pressure to increase revenue collection have created a tax scheme in Ecuador that encourages non-industrial companies to seek the benefits of registering as such, particularly in the case of very small or micro-enterprises.

CONCLUSIONS

The main characteristics that define the artisanal enterprise in the Ecuadorian environment are not traditionally accepted but also include characteristics constructed over time by the legal system and the interests of development cooperation. In this respect, the most common characteristics of other regions of the world are the generational tradition of the craft, master-apprentice relationship, labor-intensive transformation process, cultural and artistic representation, and associativity among family and friends. These are all qualitative characteristics.

The characteristics of the artisan enterprise that are not necessarily shared with other regions of the world but which are explained by the history of the region and support the fulfillment of the objectives of international cooperation for poverty alleviation, mainly in rural areas, are: small size, preferably micro-enterprise; inclusion of services that meet local needs (such as food processing, masonry, plumbing, haircutting, among others) and certification through public training programs. In this way, the statistical data that in other regions correspond to micro-enterprises in Ecuador are characteristics that pertain to artisanal enterprises. In the Ecuadorian reality, it takes work to maintain a dividing line between one group and the other. In the Republic of Ecuador, the term microenterprise is called artisanal enterprise and vice versa.

What implications does this have for development cooperation in Ecuador? This cooperation has yet succeeded in getting companies to abandon the artisanal process to industrialize; however, it has alleviated poverty, even under critical scenarios in the international environment. It has yet to succeed in getting artisanal enterprises to develop and grow; instead, it has favored the preferably micro or small size of these enterprises. Development programs in this region have allowed for the preservation of cultural heritage but have yet to allow for a greater degree of development of the local economy. It may be due to the size of the country and the importance of the cultural heritage it preserves.

The importance of craft activity and the preservation of cultural heritage is understood. However, the absence of boundaries between artisanal and micro-enterprises encourages the risk of artisanal enterprises becoming only marketers. The latter situation would slow down rural development, increase dependence on the outside world, and increase poverty in the medium term. It seems that there are some exciting research areas for the future related to the artisanal sector in Ecuador:

1. What specific measures have been implemented to support the artisanal sector in Ecuador? This research area will explore the measures taken by the government, non-governmental organizations, and other stakeholders to support the artisanal sector in Ecuador. The study will examine the effectiveness of these measures and identify potential gaps in the support provided. The research will also explore the challenges faced by the artisanal sector and the opportunities for growth and development.

2. How have tax exemptions contributed to the confusion between micro-enterprises and artisanal workshops/artisans? This research area seeks to explore the impact of tax exemptions on the artisanal sector in Ecuador. The study will examine how tax exemptions have affected the sector's growth, precisely the confusion it has caused between micro-enterprises and artisanal workshops/artisans. The research will also examine the policies and strategies that can be implemented to address these challenges.

3. What are the limitations and scope of the new institutional lines of action for the artisanal enterprise in Ecuador? This research examines the new institutional lines of action for the artisanal enterprise in Ecuador and their limitations. The study will explore the scope of the new institutional lines of action and identify potential challenges and opportunities for the artisanal sector. The research will also examine the policies and strategies that can be implemented to maximize the benefits of the new institutional lines of action.

Addressing these research areas will provide invaluable insights into the artisanal sector in Ecuador, allowing stakeholders to develop more effective policies and strategies to support the sector's growth and development. These insights can inform the development of policies and programs that promote the growth of the artisanal sector in Ecuador, which will have significant economic, social, and cultural benefits for the country.

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Adaptability of a Business and Superior Performance: Triad Model of Dynamic Capabilities

Adaptabilidad organizacional y desempeño superior: Modelo Tríada de Capacidades Dinámicas

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ABSTRACT

This study examines the relationship between business adaptability and superior performance. The researchers used Exploratory Factor Analysis and Kruskal-Wallis statistics to analyze data from a survey of 227 companies associated with a University Center. The study found that the Triad Model of Dynamic Capabilities, which includes Sense, Seize, and Transform components, explained 78.38% of the variance in business adaptability. The findings confirm the importance of Sense, Seize, and Transform capabilities in sustaining competitive advantage, as demonstrated by the observed superior performance of the organizations. The paper's originality lies in identifying higher-order capabilities associated with business adaptability in organizations across different sectors.

Keywords: Business adaptability; superior performance; dynamic capabilities; competitiveness.

JEL code: M14.

RESUMEN

Este estudio examina la relación entre la adaptabilidad empresarial y el rendimiento superior. Los investigadores utilizaron Análisis Factorial Exploratorio y estadísticas de Kruskal-Wallis para analizar datos de una encuesta de 227 empresas asociadas a un Centro Universitario. El estudio encontró que el modelo tríada de capacidades dinámicas, que incluye componentes Detección, Aprovechamiento y Transformación, explica el 78,38% de la variación en la adaptabilidad empresarial. Los hallazgos del estudio confirman la importancia de las capacidades de detección, aprovechamiento y transformación para mantener la ventaja competitiva, como lo demuestra el desempeño superior observado de las organizaciones. La originalidad del estudio radica en identificar capacidades de orden superior asociadas con la adaptabilidad empresarial en organizaciones de diferentes sectores.

Palabras clave: Adaptabilidad empresarial; rendimiento superior; capacidades dinámicas; competitividad.

Código JEL: M14.

INTRODUCTION

Technological changes, evolving consumer needs, and market dynamics are external factors that significantly influence organizational performance (Bayighomog et al., 2020). The literature on strategic management and resources has explained the factors contributing to attaining superior results in sustainable competitive advantage (Andersén, 2021). Furthermore, the Dynamic Capabilities (DC) perspective delves deeper into the analysis, elucidating how competitive advantage and superior performance are achieved (Kaur, 2019). Therefore, dynamic capabilities have recently earned considerable attention as organizations endeavor to adapt to unpredictable business environments.

Numerous contributions to the DC perspectives have emerged since its introduction, particularly in literature reviews and theoretical stances, compared to the empirical evidence generated (Reimann et al., 2021). Considering the heterogeneity of the research subjects, the abstraction of the conceptual framework of the research perspective, and the nomological network, the possibility of contributing to the development of the perspective remains valid (Leemann & Kanbach, 2022; Schriber & Löwstedt, 2020; Schilke et al., 2018).

Therefore, the study aims to analyze the business adaptability of firms and superior performance, utilizing the Triad Model of DC (Pitelis et al., 2023), a set of distinctive capabilities that allow the organization to adapt and innovate. The variables sense, seize, and transform have been scrutinized based on the available state-of-the-art literature and collected a priori to ensure consistency with systematic progress (Pitelis et al., 2023). These variables are selected because there are active studies in which the company is involved, through Sense or detect activities, can interpret the information to develop changes to adapt to customers, suppliers, market, or competitors (Khan et al., 2020) and, at the same time, develop capabilities that help to adapt to these changes. By seizing or integrating knowledge into the different changes (Correia et al., 2021), and with the above, the company will be able to transform and reallocate resources without compromising the company's performance (Prester, 2023).

A non-experimental, exploratory, and cross-sectional study was designed for this research. Key informants included middle and senior managers of companies that hosted students from the Internship Program of the University Center between November 2021 and April 2022. The company's age was a control variable when calculating a stratified sample. Two hundred twenty-seven companies met the inclusion criteria, with a margin of error of 5% and a confidence level of 95%. A self-administered electronic survey was constructed using perceptual measures and distributed through emails from the University Center (CUCEA, 2021; 2022). Descriptive statistics and exploratory factor analysis were utilized to analyze

business adaptability and superior performance, and the nonparametric test Kuskal-Wallis was chosen to test hypotheses.

DYNAMIC CAPABILITIES TAXONOMY

The literature review unveils extensive research on Dynamic Capabilities (DC) frameworks. Schilke et al. (2018), Arend and Bromiley (2009), and Teece (2007) highlighted criticisms of its construct in the decades after the perspective's introduction. The primary controversy concerns whether DC should be perceived as a process or capability enabling firms to uphold their competitive advantage (Wilhelm et al., 2022). The contributions of Eisenhardt & Martín (2000) and Teece and Pisano (1994) have influenced numerous researchers and essays, presenting divergent narratives that hindered the perspective's consolidation (Kurtmollaiev, 2020; Waleczek et al., 2019; Pavlou & El Sawi, 2011; Helfat, 2007). The discussion also addresses the implications of dynamic capabilities for organizational strategy and the challenges linked to their development and effective utilization.

The hierarchical treatment has been vital to reconciling positions and reducing the concepts' abstraction level (Chen, 2005). To date, sufficient evidence has emerged affirming that employing concept hierarchization makes it possible to structure the perspective taxonomy, concluding that the schools of Teece and Eisenhardt are complementary and convergent. Their integration provides valuable elements for advancing the perspective toward consolidation (Wenzel et al., 2021).

There is consensus that the taxonomy includes first- and second-level capabilities (Teece, 2018, p. 363). The first level of the taxonomy, also called high-order capabilities, pertains to observable behaviors across organizations' cultures that represent competitive advantage (Santoro et al., 2019; Bogers et al., 2019). It is inferred that companies with these capabilities are flexible, collaborative, and prone to adaptation to sustain superior performance (Kahn et al., 2020). These capabilities are observed in the study to elucidate how companies attain organizational adaptability through the implementation of the triad model, which integrates the capabilities of Sense, seize, and transform (Leemann & Kanbach, 2022; Leemann et al., 2021; Furnival et al., 2019).

First-level capabilities, (1) sense, are capabilities through which organizations identify emerging opportunities and environmental threats. (2) Seize and (3) Transform are capabilities by which the organization captures and reconfigures its resources to capitalize on the insights (Popadiuk et al., 2018; Zahra et al., 2006).

While operational processes are considered second-order or micro-foundational capabilities, they are now learning is generated and used to develop improvements, thereby accumulating knowledge, improving processes, and ultimately aligning with first-order capabilities (Gaviria-Marin et al., 2021; Wenzal et al., 2021; Helfat, 2007). Processes allow the organization to cultivate first-order DC, thus elucidating how business adaptability is achieved. Firms respond to the dynamism of the environment by employing different configurations of resources and capabilities that are influenced by the firm's characteristics and its context (Bayighomog et al., 2020; Chen et al., 2021; Fainshmidt et al., 2016; Foss & Lindenberg, 2013; Peteraf et al., 2013; Foss, 2011). Therefore, studying firm heterogeneity reveals different ways of sensing, seizing, and transforming firms and contributes to the strategic management of firms (Foss, 2011, p. 1414).

Popadiuk et al. (2018) and Leemann and Kanbach (2022) observed the alignment between second-order processes and the three critical high-order capabilities or competencies in the dynamic capabilities' taxonomy: Sense, Seize and Transform (Yoshikun, described initially by Teece and Pisano (1994) and supplemented by Furnival et al. (2019) and Leemann et al. (2021).

With the organization of the taxonomy, the contributions of dynamic capabilities (DC) are strengthened. This perspective provides a theory of the mechanisms used by organizations to maintain a position of competitive advantage over time, complementing the theory of resources and strategic management, which is particularly relevant in constantly changing environments (Teece et al., 1997; Eisenhardt et al., 2000; Doz, 2020).

Therefore, to measure business adaptability, the study adheres to the hierarchical treatment of the taxonomy and focuses its observations on the high-level capabilities presented by Teece and Pisano (1994). Three key capabilities, Sense, Seize, and Transform, permeate the organization (Kurtmollalev, 2020; Schilke et al., 2018).

Incorporating empirical evidence to validate the Triad Model of DC remains ongoing; therefore, adding empirical support is crucial. Araújo et al. (2018), Kump et al. (2018), Pavlou and El Sawy (2011), and Thanh Nhon et al. (2020) have made contributions toward achieving this objective. The study is designed to contribute using the perspective's first-level taxonomy. It addresses the tautological relationships between the concepts, the triad model, and the superior performance measures (Arndt et al., 2022). Therefore, we propose the following research hypothesis:

H: There is a statistically significant difference between business adaptability and superior performance.

Triad model of Dynamic capability

The Triad Model conceptually connects with studies on ambidexterity, entrepreneurial attitude, willingness to learn, high collaboration rates, and effective communication mechanisms (Frogeri et al., 2022; Vu, 2020). The framework integrates and extends the concepts of strategic management and policy issued within organizations and their correlation with superior performance (Min & Kim, 2022; Hernández-Linares et al., 2020; Arndt & Pierce, 2018). The study embraced the dynamic capabilities concepts outlined below to examine how companies adapt to challenging environments.

Sense/Detect entails behaviors or activities focused on exploring and interpreting information, reflecting the company's inclination to monitor the environment for identifying changes in customers' or suppliers' needs, latent demands, or the emergence of new markets or competitors (Khan et al., 2020). It aligns with second-level studies (Microfoundation) that encompass collaboration mechanisms, knowledge transfer, and adoption of new technologies (Alshanty & Emeagwali, 2019), as well as the examination of customers, suppliers, and reengineering of the business model (Arndt et al., 2022; Ngo et al., 2019; Teece, 2018); These efforts will enable companies to develop organizational capabilities necessary to address technological challenges (Pattanasing et al., 2019). Therefore, the following sub-hypothesis is proposed as H1.a:

H1.a: There is a statistically significant difference between the Sense and the distribution of the superior performance indicators.

Seize/Integrate denotes the organization's capacity to orchestrate or integrate knowledge manifested in the organizational culture and levels of collaboration (Peng et al., 2022; Bogers et al., 2019), guiding the company in assessing market changes, which entails understanding consumer needs, competitors' actions, and market trends (Correia at al., 2021). Micro-foundations research examines intra-organizational collaboration mechanisms, such as information-sharing systems and internal collaboration strategies for making informed and collective decisions, and their correlation with organizational competitiveness (Ortiz, 2023; Gregory et al., 2017; Friedman et al., 2016). Therefore, the following sub-hypothesis is proposed as H1.b:

H1.b: There is a statistically significant difference between the seize and the distribution of the superior performance indicators.

Transform involves the organization's capability to reallocate organizational resources to uphold the strategies envisioned in the preceding stages without compromising organizational performance. Therefore, at a higher level, it is scrutinized as an expression of

a flexible and ambidextrous organizational culture (Gelhard et al., 2016). Essentially, this stage ensures the continuous renewal of the organization's competitive advantages, augmenting its resources and capabilities through the absorption, transformation, and exploration of new knowledge (Prester, 2023; Matysiak et al., 2018; Linden & Teece, 2018). Therefore, the following sub-hypothesis is proposed as H1.c:

H1.c: A statistically significant difference exists between the transform and distribution of the superior performance indicators.

In summary, the study was designed by operationalizing the Triad Model of DC, eliminating tautological relationships between the three variables, which explained business adaptability and their relationship to the variable of superior performance.

Dynamic capability and superior performance

Theoretically, given the evolutionary logic of changing the resource base to maintain or gain competitive advantage, a natural outcome is a relationship between the triad model of DC and superior performance. Therefore, it is necessary to define how superior performance is measured. The literature review focuses on the critical importance of studying the various dimensions of performance, enabling the identification of areas for improvement within the organization (Cristofaro & Lovallo, 2022; Rengkung, 2022; Ringov, 2017). We divide superior performance indicators into qualitative and quantitative categories for practical purposes, defining them below.

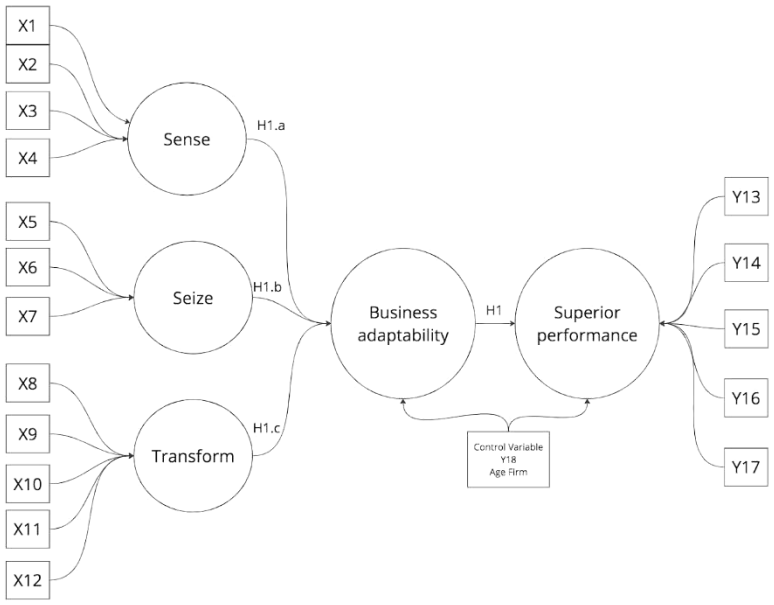
First, the quantitative measures commonly used in academic studies are related to financial performance. The concept pertains to the economic health of companies over a specified period. Some metrics are associated with return on assets, equity, and earnings per share (Gjoni et al., 2022; Sánchez-Gutiérrez et al., 2019). Other studies analyze Key Performance Indicators (KPIs), such as absenteeism, employee turnover, churn cost, health cost, outputs, performance, profitability, and time worked. These also represent quantitative measures (Bortoluzzi et al., 2021).

Second, qualitative measures are essential for understanding aspects that quantitative data alone cannot capture. These measures often include customer satisfaction assessments, leadership effectiveness, and organizational culture (Bortoluzzi et al., 2021). Although qualitative indicators are more subjective and difficult to quantify, they provide a comprehensive view of a company's performance. Frameworks such as SERVQUAL demonstrate the potential of qualitative measures (Sarathy, 2006). In this line of thinking, perceptual measures can be valid and accurate if they capture the experiences and attitudes of those most closely associated with the organization, as demonstrated by the study of Ross and Grace (2012).

According to VU (2020), researchers employ qualitative and quantitative superior performance measures. Therefore, this study implemented five indicators for the variable superior performance using a comprehensive measure adapted from Thanh Nhon et al. (2020) work. The adaptation of the measures addresses tautological associations between the variables.

Gaviria-Marin et al. (2021) used the company's age as a control variable, which is essential because it is often associated with accumulating knowledge and experiences. Therefore, older firms typically possess established routines, deeper customer relationships, and more robust brand recognition. Thus, the company's ability to address rapidly changing environments can be observed through its longevity. The interplay between the age of the organization and dynamic capability influences the ability to strategize for sustainable success, ultimately correlating with superior performance (Chen et al., 2021). Some studies supporting the aforementioned include Lin et al. (2020), Mikalef et al. (2020), Zahra et al. (2006), and Eisenhardt and Martin (2000). The study's reflective model has three independent variables measuring business adaptability: Sense, seize, and transform; five items for superior performance as the dependent variable; and finally, the control variable, age firm (Figure 1).

Figure 1
Research model. Business adaptability and Superior performance



Source: Own elaboration.

METHODS

The research is non-experimental, exploratory, and cross-sectional. It was designed to explain business adaptability and its correlation with superior performance. The study involved middle and senior managers who supervised students during internships between November 2021 and April 2022. A self-administered electronic survey distributed through emails from the University Center (CUCEA, 2021; 2022) served as the data collection tool. The information collection lasted six months, from November 2021 to April 2022. The Centro Universitario de Ciencias Económico Administrativo (CUCEA) facilitated the survey through its Professional Internship Program in 2021 and 2022. The survey was constructed using perceptual measures (Leví-Magnin and Varela-Malloy, 2003). A lower score indicated more robust disagreement with the statement, while a higher score represented significant agreement. The survey included 12 items to measure business adaptability, with five dedicated to assessing superior performance. Lastly, the age of the firm was used as a control variable.

Normality was assessed using the histogram technique in the Statistical Package for Social Sciences ver. 21.1 (SPSS). The data exhibited asymmetry, with a mean of 2.43 and a standard deviation of 0.75 (nh= 227). Companies with eight or more years in the market were proportionally the most represented stratum (59%). Content validity was estimated using the Lawshe method, yielding a content validity index of 94%. The instrument's reliability was assessed with Cronbach's alpha coefficient using SPSS, yielding a value of 94.3%.

The study used descriptive statistics, where the standard error of the mean, mean standard deviation, and lower and upper limits. An exploratory factor analysis (EFA) used the principal component method to elucidate the data behavior and interdependence among the Triad Model of DC components. The EFA techniques employed were (1) correlation test, (2) commonalities, (3) component matrix, (4) KMO and Bartlett, and (5) proportion of variance explained. No underlying factors were identified. Consequently, we grouped the measures according to the operational concept of the Triad model of DC and conducted a second exploratory factor analysis. Rotation tests and sedimentation plots were deemed unnecessary for this analysis (Fornell & Larcker, 1981).

The data's nature and research objectives justify using the Kruskal-Wallis test for hypothesis testing. First, the data asymmetry violates the normality assumption required for parametric techniques such as ANOVA. According to Gibbons and Chakraborti (2011), the Kruskal-Wallis test is a natural extension of the two-sample Wilcoxon test (p.357), making it suitable for non-normally distributed data. Given the asymmetry of the data, alternatives such as the median test extension and Kruskal-Wallis, Terry, and Van der Waerden tests are all

appropriate. However, the researchers chose the nonparametric Kruskal-Wallis test because of its simplicity, power, availability of exact distribution tables, and reasonably accurate chi-squared approximation (Gibbons et al.,2011, p. 378). Researchers have found the technique to be 95% effective compared to other parametric methods.

In addition to considering the nature of the data and the test's effectiveness, have also been considered software compatibility. The Statistical Package for Social Sciences (SPSS) version 21.1. was used for the analysis, and the Kruskal-Wallis test was quickly implemented and widely used within this software package. Therefore, the test emerged as the preferred choice for hypothesis testing, providing a robust and accessible method for examining differences in medians across multiple groups.

Finally, 555 (N) companies met the criteria for inclusion in the sample by substituting the literals of the formula for calculating the sample in a finite population; a sample of 227 (nh) was obtained, stratified by the control variable of the firm's age. The maximum allowable error was 5%, and the confidence level was 95%. (Table 1)

Table 1
Population and sample stratified according to the age of the company

Age of the firm	Population (N)	Proportion	Sample (nh)
Equal to or less than three years	89	16%	36
Between four and seven years old	139	25%	57
Equal to or greater than eight years	327	59%	134
Total	555	100%	227

Source: Own elaboration, CUCEA (2021; 2022)

RESULTS AND DISCUSSION

Descriptive statistics results

The results of the descriptive statistics indicate a standard error of the mean (SEM) ranging from 0.6 to 0.8. In the specific context of a stratified sample of 227, a confidence level of 95%, and an estimated error of 5%, this provides a relatively accurate estimate of the population mean. The results demonstrate a comprehensive understanding of the distribution of the indicators of interest across the population (Berndt, 2020). The median (Me) corresponds to the sample's 6 and 7 categorical data; the standard deviation (s) ranges between 0.86 and not greater than 1.26. The minimum and maximum limits of the scale values can be observed in Table 2.

Table 2
Descriptive statistics Business adaptability and Superior performance

Item	Standard error of the mean (SEM)	Me	s	Minimum	Maximum
Business adaptability					
X1. Identify opportunities systematically	0.06	7	0.97	2	7
X2. Plan in accordance with the company´s identified opportunities	0.07	6	1.05	3	7
X3. Identify threats systematically	0.07	6	1.10	2	7
X4. Respond to detected threats	0.07	6	1.07	2	7
X5. Congruence between the capacity and the assigned task	0.07	7	1.01	3	7
X6. Knowledge sharing	0.06	7	0.86	1	7
X7. Internal organizational alignment	0.07	6	1.01	2	7
X8. Clear HR reallocation process.	0.07	6	1.19	1	7
X9. Operational needs are constantly communicated	0.07	6	1.02	3	7
X10. Guarantees operational efficiency	0.07	6	1.04	2	7
X11. Ambidextrous company	0.07	7	1	2	7
X12. Contingency adaptation	0.06	6	0.92	2	7
Superior performance					
Y13. Compared to the competition, higher quality products and services	0.07	6	1.07	2	7
Y14. Higher levels of customer satisfaction compared to the competition	0.08	6	1.18	1	7
Y15. Higher profitability in comparison to the competition	0.08	6	1.23	1	7
Y16. More innovative products and services than competitors	0.08	6	1.18	2	7
Y17. Higher revenue growth compared to the competition	0.08	6	1.26	1	7

Source: Own elaboration.

Exploratory Factor Analysis results

The exploratory factor analysis (EFA) results using the principal component method are presented in Tables 3 and 5. The Pearson correlation (r) ranges from weak to moderate for the company's business adaptability component and is crucial for superior performance items. The test of communality (h) reveals some indicators with values greater than 0.50, which are considered significant as they explain 25% of the variance, except for three items (X6, X7, and X9), which obtained values of 0.47, 0.45 and 0.46, respectively, the results of (λ), which represents the root of the eigenvalues, range between 0.67 and 0.84. It indicates that a significant amount of variance in the data is explained. Considering the value between weak and moderate correlation, the theoretical emphasis that seemingly insignificant factors can play a critical role in organizational adaptation and change in the effectiveness of dynamic capabilities (Belitski & Mariani, 2023; Apascaritei & Elvira, 2022; Camisón-Zornoza et al., 2020).

In this line of thought, the DC perspective underscores the significance of the specific context of each firm (Furnival et al., 2019). It implies that items may be relevant even if their correlations are modest (Furnival et al., 2019). It is consistent with the understanding of business complexity described by Teece (2007) and articulated by Andersén (2021), where the diversity of strategies employed to exploit resources and capabilities within companies must be considered.

Table 3
Result in EFA for variable business adaptability

Indicator	r	h	λ
X1. Identify opportunities systematically	1	.54	.73
X2. Plan in accordance with the company´s identified opportunities	0.69	.55	.74
X3. Identify threats systematically	0.51	0.64	0.80
X4. Respond to detected threats	0.52	0.66	0.81
X5. Congruence between the capacity and the assigned task	0.50	0.52	0.72
X6. Knowledge sharing	0.54	0.47	0.68
X7-I. Internal organizational alignment	0.47	0.45	0.67
X8. Clear HR reallocation process.	0.45	0.52	0.72
X9. Operational needs are constantly communicated	0.36	0.46	0.68
X10. Guarantees operational efficiency	0.57	0.71	0.84
X11. Ambidextrous company	0.47	0.63	0.79

X12. Contingency adaptation	0.60	0.70	0.84

Source: Own elaboration.

In order to ensure that all critical aspects are captured and not to reduce the quality of the model, the researchers grouped the indicators based on their operational definition rather than eliminating measures with factor loads below a certain threshold. This approach was informed by research conducted by Leemann & Kanbach (2022), Leemann et al. (2021), Furnival et al. (2019), Lloret-Segura et al. (2014), and Teece (2007). Table 4 presents the results of an exploratory factor analysis (EFA) for the Triad Model of dynamic capabilities, with the indicators grouped to observe business adaptability.

The results of EFA for business adaptability have captured a significant portion of the variability in the data, with an AVE of 78% for the variables of the Triad model of DC. It indicates that the analyzed variables can explain much of the variation. Additionally, the commonality of the factor loadings is within an adequate range, with values between 0.69 and 0.83. These values signify the strength of the relationship between the factors in the Triad Model, with the transform variable being the most representative with an h value of 0.83, r = 0.78, and λ = 0.91. The correlations between the model's variables are robust, with coefficients ranging from 0.61 to 0.78, indicating significant relationships.

Furthermore, the significance value is less than 0.05, and the Kaiser-Meyer-Olkin measure of 0.70 indicates that the data sample is suitable for factor analysis. It supports the validity of the results (Mavrou, 2015). No underlying factors have been identified.

Table 4
Result from EFA for Variable Business Adaptability

Independent variable indicators						
Indicators	**r**	**h**	**λ**	**AVE**	**p**	**KMO**
1a. Detect	0.61	0.81	0.90	**78.38**	**< 0.05**	**0.70**
1.b. Integrate	0.63	0.69	0.83			
1.c. Transform	0.78	0.83	0.91			

Source: Own elaboration.

The results of the exploratory factor analysis for the dependent variable indicators are shown in Table 5. The Pearson correlation (r) is between 0.60 and 0.75, suggesting a substantial and coherent relationship between indicators. The h values between 0.69 and 0.85 indicate that the observed variables are well represented, which suggests adequate interpretability of the structure (Mavrou, 2015). The AVE was calculated while keeping the indicators consistent with the survey data. The AVE result for the dependent variable (Superior performance) was

76%, indicating that the variables can explain a significant amount of the total variability in the data. The Kaiser-Meyer-Olkin (KMO) result was 0.88, and the significance value (p) was less than 0.05. These results indicate that the EFA has identified a significant and reliable factor structure in the data, providing valuable insight into the relationship between the observed variables (Veliscer & Jackson, 1990).

Table 5
Result in EFA for Variable Superior performance

Dependent variable indicators						
Indicators	**r**	**h**	**λ**	**AVE**	**p**	**KMO**
Y13. Compared to the competition, higher quality products and services	1	0.69	0.83	**76.79**	**< 0.05**	**0.88**
Y14. Higher levels of customer satisfaction compared to the competition	0.75	0.82	0.91			
Y15. Higher profitability in comparison to the competition	0.71	0.85	0.92			
Y16. More innovative products and services than competitors	0.60	0.74	0.86			
Y17. Higher revenue growth compared to the competition	0.60	0.71	0.84			

Source: Own elaboration.

Hypothesis testing: Sense variable

Given the data's lack of normality, the researchers chose the nonparametric Kruskal-Wallis test, also known as the H test, to test the research hypotheses. The test statistic H is computed based on these ranks. Its distribution is approximated by the chi-square distribution with k - 1 degrees of freedom, where k is the number of groups that use the ranges of the sampled data to determine whether they come from populations with equal medians. This approach identifies significant differences between the variables (groups). The procedure involves formulating the null hypothesis, which is established regarding equality. Then, the H statistic is calculated from the ranks of each group. If the H value is high, it is more likely that there are significant differences. The degrees of freedom (gl) are calculated with k-1. Finally, it is determined whether there is an asymptotic relationship based on the chi-square distribution.

Hypothesis 1.a. There is a statistically significant difference between the Sense and the distribution of the superior performance indicators.

Zhang et al. (2021) observed that collaboration between firms can promote the acquisition and use of existing and new knowledge of the firm, improving the ability of the firm to adapt

to the market. Considering the findings of Chen (2021), whose empirical evidence shows that the ability to learn shapes the ability of the firm capacity for significant innovation. It aligns with Santoro et al. (2019), whose findings indicate that the orientation of an organization towards the management of knowledge has a positive relationship with its performance.

The results of Kruskal-Wallis statistics (Table 6) show that Sense and the distribution of superior performance indicators are statistically significant; an asymptotic relation between the groups is observed through the differences of the medians, the value of H is between 44.37 and 61.89. Hypotheses 1.a has been accepted, with statistically significant differences observed at a significance level < 5%.

Table 6
Hypothesis test results for Sense and indicators of Superior Performance

Hypothesis	Sig.	Decision	nh	H	g
There is a statistically significant difference between *Y13* higher quality products and services and 1.a *Sense*	0.00	**Accepted**	227	51.55	4
There is a statistically significant difference between *Y14* Higher levels of customer satisfaction and 1.a *Sense*	0.00	**Accepted**	227	53.61	4
There is a statistically significant difference between *Y15* Higher profitability and 1.a *Sense*	0.00	**Accepted**	227	60.82	4
There is a statistically significant difference between *Y16* innovative products and services and 1.a *Sense*	0.00	**Accepted**	227	44.37	4
There is a statistically significant difference between *Y17* Higher revenue growth and 1.a *Sense*	0.00	**Accepted**	227	61.89	4

Source: Own elaboration.

Hypothesis testing: Seize variable

Analyzing the seize variable with the Kruskal-Wallis test exemplifies the challenge of operating and observing internal collaboration to gain a competitive advantage. Findings suggest that a more significant presence of the seize variable corresponds to a greater presence of superior performance indicators. It supports the affirmation made by Pavlou and El Sawy (2011) regarding the importance of synchronized work, sharing individual knowledge within the group, and the company's ability to implement changes (Kump et al., 2018). Hypotheses 1.b were accepted, with statistically significant differences observed at a significance level < 5%. Values suggest that higher quality products and customer satisfaction are both indicators of superior performance and are more representative; these indicators have the highest value of H. However, compared to the values of H from variable Sense and transform, seize has the lower values of H statistics. (Table 7)

Hypothesis 1.b. There is a statistically significant difference between the Seize and the distribution of the superior performance indicators.

Decision: Accepted

Table 7
Hypothesis test results for Seize and indicators of Superior Performance

Hypothesis	Sig.	Decision	nh	H	g
There is a statistically significant difference between *Y13* higher quality products and services and 1.b *Seize*	0.00	**Accepted**	227	32.05	4
There is a statistically significant difference between *Y14* Higher levels of customer satisfaction and 1.b *Seize*	0.00	**Accepted**	227	30.38	4
There is a statistically significant difference between *Y15* Higher profitability and 1.b *Seize*	0.00	**Accepted**	227	30.94	4
There is a statistically significant difference between *Y16* innovative products and services and 1.b *Seize*	0.00	**Accepted**	227	19.12	4
There is a statistically significant difference between *Y17* Higher revenue growth and 1.b *Seize*	0.00	**Accepted**	227	27.11	4

Source: Own elaboration.

Hypothesis testing: Transform variable

We analyzed the transform variable using a base of five indicators. Some of the abilities observed communicated operational needs, predecessors of similar measures contained in Friedman et al. (2016). Additionally, we observed strategic adjustments to operational and organizational practices (Gelhard et al., 2016). Another indicator was the reconfiguration process as a mechanism of ambidexterity (Peng et al., 2022). In summary, transform is the ability to orchestrate and deploy tasks, resources, and activities to expand the operational capabilities (Pavlou & El Sawy, 2011, p. 247), as well as the ability to be flexible and to adapt to the situation at hand (Kump et al., 2018).

Hypothesis 1.c. A statistically significant difference exists between the transform and the distribution of the superior performance indicators.
Decision: Accepted

Hypothesis 1.c have been accepted (Table 8), with statistically significant differences observed at a significance level < 5%. The results indicate a significant difference and an asymptotic relationship with the transform variable across all measures of superior performance, with an H-value greater than 50, four degrees of freedom, and a significance level inferior to 0.05. The superior performance indicators with the highest H value exhibit higher levels of customer satisfaction than the competition (H = 65.92) and Higher

profitability (H = 64.77). It aligns with implementing renewal activities to achieve greater success than competitors in diversifying services, products, and processes to maintain superior performance (Kump et al., 2018). Transformation is a mechanism to ensure the company's permanence in the market despite having limited resources compared to the competition (Peng et al., 2022).

Among the three variables of the Triad Model for DC, the value of the H statistic for the Transform variable was the most stable and highest compared to the Sense and the Seize variables. Following this line of thought, companies with the most significant capacity to transform are those with high capacities to detect and integrate. Thus, Matysiak et al. (2018, p. 230) emphasize the value of the interdependence between the measures: "To create and sustain competitive advantages, companies disaggregate dynamic capabilities into continuous but sequential sensing, seizing, and transforming" statement based on Teece et al. (1997).

Table 8

Hypothesis test results for transform and indicators of Superior Performance

Hypothesis	Sig.	Decision	nh	H	g
There is a statistically significant difference between *Y13* higher quality products and services and 1.c *Transform*	0.00	**Accepted**	227	54.63	4
There is a statistically significant difference between *Y14* Higher levels of customer satisfaction and 1.c *Transform*	0.00	**Accepted**	227	65.92	4
There is a statistically significant difference between *Y15* Higher profitability and 1.c *Transform*	0.00	**Accepted**	227	64.77	4
There is a statistically significant difference between *Y16* innovative products and services and 1.c *Transform*	0.00	**Accepted**	227	59.83	4
There is a statistically significant difference between *Y17* Higher revenue growth and 1.c *Transform*	0.00	**Accepted**	227	61.45	4

Source: Own elaboration.

Given the evolutionary fitness effect of DC, Lin et al. (2020) conclude that firms must re-evaluate their strategies and strengthen their ability to sense, seize, and transform in order to face competition and changing environments. Therefore, the ambidexterity concept will prevail in which exploitation-driven and exploration-oriented organizations are an evolutionary fit (Frogeri et al., 2022). Additionally, Popadiuk et al. (2018) observe that ambidexterity and DC literature utilize exploration and exploitation of knowledge to observe business adaptability capacity.

For the reasons mentioned above, when there is evidence of superior performance, it is expected that business adaptability will be present (Cristofaro & Lovallo, 2022). The result

of the central hypothesis is presented in Table 9. The Kuskal-Wallis statistics reveal a significant difference and an asymptotic relationship between dependent and independent variables. It is observed that the highest range of capabilities corresponds to the highest range of superior performance. The H statistic is 68.19, with four degrees of freedom and a statistical significance level < 5%.

Hypothesis 1. There is a statistically significant difference between business adaptability and superior performance.
Decision: Accepted

Table 9
Hypothesis test results for Business adaptability and Superior Performance

Hypothesis	Sig.	Decision	nh	H	g
(1). There is a statistically significant difference between *business adaptability* and *superior performance*	0.00	**Accepted**	227	68.19	4

Source: Own elaboration.

CONCLUSION AND LIMITATIONS

The dynamic capabilities perspective arises from resource-based theory and strategic management. The Triad Model of DC examines these capabilities through intra-organizational behaviors that constitute business adaptability and, consequently, a competitive advantage (Cristofaro & Lovallo, 2022; Markovich et al., 2022; Doz, 2020; Zhang et al., 2018). While maintaining taxonomy and avoiding tautological relationships, the use of perceptual measures is a valuable technique for observing the presence of DC (Min & Kim, 2022; Thanh Nhon et al., 2020; Ross & Grace, 2012). According to the literature, these characteristics represent competitive advantages and define a flexible, ambidextrous, and adaptable organization that produces results perceived as superior to competitors. (Al-Matari et al., 2022; Almaraz, 2022; Gaviria-Marin et al., 2021).

The literature review revealed evidence of the integration of the contributions of Teece and Pisano (1994), Eisenhardt and Martin (2000), and the Ambidexterity theory (Frogeri et al., 2022). These frameworks complement each other and, when integrated, enhance the taxonomy of perspective capabilities, delineating first and second-level capabilities (Leemann & Kanbach, 2022). It addresses the observation that the taxonomy of the dynamic capability's perspective lacks order (Kurtmollaiev, 2020; Schilke et al., 2018). The Sense, seize, and transform triad model of DC reinforces and advances the dynamic capabilities perspective on consolidation (Leemann & Kanbach, 2022; Leemann et al., 2021; Thanh Nhon et al., 2020; Kump et al., 2018; Teece, 2007).

The descriptive statistics results, considering a stratified sample of 227, a confidence level of 95%, and an estimated error of 5%, indicate an SEM of 0.6 to 0.8, suggesting a relatively accurate estimate of the population mean in the specific context of a stratified sample. Therefore, the distribution of the indicators of interest across the population is understood (Berndt, 2020). Conversely, the Exploratory Factor Analysis (EFA) results for the variable Business Adaptability have captured a significant part of the variability present in the data, with an AVE of 78% for the variables of the first-order triad model of DC. It indicates that the extracted factors can explain much of the variation observed in the variables analyzed. The commonalities of the factor loadings are within an adequate range, with values between 0.69 and 0.83, indicating the strength of the relationship between the factors in the model, with transformation being the most representative (h value of 0.83, r = .78, and λ = .91). The correlations between the variables of the model are robust, with coefficients ranging from 0.61 to 0.78, indicating significant relationships between them. Similarly, the values of the matrix components are consistently high, oscillating between 0.81 and 0.91, indicating a strong association between the observed variables. Furthermore, the significance value is less than 0.05, and the Kaiser-Meyer_Olkin measure of 0.70 indicates that the data sample is suitable for factor analysis, supporting the validity of the results (Mavrou, 2015).

The literature review indicates that Sense represents the firm's ability to systematically search for information outside the firm to identify opportunities and threats to formulate action plans (Kump et al., 2019; Pavlou & El Sawi, 2011). According to Mostafiz, companies with a high ability to sense are "Able to identify opportunities arising from changes in customers, technology, and their competitors, increasing their ability to adapt" (2020, p.18). The results of the Exploratory Factor Analysis (EFA) suggest that companies associated with Centro Universitario de Ciencias Económico Administrativas (CUCEA) through the internship program commonly engage in increasing knowledge and integrating it into decision-making processes (Al-Matari et al., 2022; Barros-Contreras et al., 2021).

The H statistic for the grouped variable Sense and the indicator of superior performance has a lower bound of 44.37 and an upper bound of 61.89, corresponding to product and service innovation and more significant revenue growth, respectively. The more incredible revenue growth indicates superior performance, exhibiting the highest disparity within the sense variable. The data's behavior is asymptotic, and the significance level is <0.5. The second most important factor is higher profitability and greater customer satisfaction. These results are consistent with firms' interest in gathering, sharing, analyzing, and utilizing market intelligence (Bayighomog et al., 2020) and decision-making through big data analytics (Akter et al., 2020). The mediating role of the sense variable on the variables is to seize and transform (Markovich et al., 2022).

The seize variable examines whether firms utilize internal collaboration mechanisms to gain competitive advantage. The H statistics results indicate that a more substantial presence of the integrated indicators corresponds to a more significant presence of superior performance, which aligns with the importance of synchronized work sharing and sharing individual knowledge to the group (Pavlou & El Sawy, 2011), and the consistency of the company in the implementation of planned changes (Kump et al., 2018). The H statistics ranged between ranks 19.12 and 32.05. Compared with innovation in product and service, the seized variable had the lowest H value, and the highest quality product or service had the most representative H value.

The data's behavior is asymptotic, and the significance level is <0.5. This observation is consistent with Peng et al. (2022) assertion regarding the importance of alignment, organizational structure design, and organizational processes in adapting firms to environmental and technological change. The results indicate that the companies associated with the University Center possess this ability, although to a lesser extent than the Sense and transform variables. Future efforts should complement the scale with items aligned to the triad DC model. However, considering that seize has the highest level of abstraction, it is inferred that this tends to make it less noticeable to be observed (Le & Lei, 2019; Gregory et al., 2017; Friedman et al., 2016). Researchers suggest conducting studies at the second level or micro-foundations to specify the mechanisms by which top management creates or incentivizes collaboration and knowledge absorption among the different levels of the organizational structure.

We utilized five indicators to analyze the Transform variable, including the ability to communicate operational needs, among other measures. This indicator emerged as the most representative, exhibiting the highest factor loadings and correlation values. Decision-makers ensure that flexibility does not compromise operational efficiency and that improvements in production, administration, maintenance processes, or the integration of new technologies are effectively implemented. They must also ensure that the organization's learning curve is short, the level of uncertainty is low, and the organization has clarity about the expected results (Hernández-Linares et al., 2020; Lin et al., 2020).

Transforming exhibits the highest correlation value, commonality, and factor loadings. Hypothesis testing was bound between 54.68, the lowest value for H, and 64.77, the highest, representing higher product and service quality and profitability, respectively. The data's behavior was asymptotic, and the significance level was <0.5. The result suggests that the greater the ability to transform, the more comprehensive the range of superior performance consistently. This finding aligns with Schepers et al. (2022), who referenced the study of Jong and Den-Hartong, highlighting the critical role of capturing innovativeness signals. Employees' intentional effort to positively influence work outcomes by introducing change

and innovation to processes, products, services, and customer solutions is crucial (Schepers et al., 2022, p.3).

The EFA results for the dependent variable (superior performance) indicate correlations ranging from 0.60 to 0.75, suggesting a substantial and coherent relationship between them. Additionally, the commonality values ranging from 0.69 to 0.85 indicate they are well represented. The values on the component matrix are high, between 0.83 and 0.92. The AVE is 76%, meaning that the extracted factors can explain a significant amount of the total variability of the data. A KMO of 0.88 indicates that the data is suitable for factor analysis (Mavrou, 2015). The superior performance measures are in line with the study of Min and Kim (2022), Peng et al. (2022), and Mostafiz (2020). The results show that when it comes to customer satisfaction and profitability, followed by products and services of higher quality or the introduction of innovations, the companies associated with the University Center have better results than their competitors.

Finally, hypothesis testing showed significant differences between business adaptability and superior performance. The relationship demonstrates an asymptotic pattern. The high H-statistics suggest a statistically significant difference. Therefore, hypotheses 1, H1a, H1b, and H1c of the study have been accepted. The operationalization of the concepts addressed the tautological relationships between the variables. Thus, empirical evidence was generated under conditions of systematic advancement, following the recommendations of Arndt and Pierce (2018). These findings emphasize the critical role of dynamic capabilities in driving superior performance. The ability to adapt through sensing, seizing, and transforming becomes a determinant of success. Therefore, investing in nurturing their dynamic capabilities in organizations is advisable.

According to the Demografía de los negocios (INEGI, 2022), observers consider them companies capable of "consciously creating, expanding, and modifying their organizational operations for adaptive purposes" (Gaviria-Marin et al., 2021, p. 417). The items measuring customer satisfaction and profitability (compared to the competition) were the most representative. Because of the COVID-19 global health emergency, the years 2021 and 2022 were financially complicated for the Mexican economy.

In Jalisco, approximately 90 days of inactivity were implemented to control the spread of the disease, and government regulations and readjustments in the global commercial chain were external factors that affected the organizations. Adaptability favored the companies associated with the University Center in maintaining their performance even during economic, political, and social pressure periods. Thus, due to the cross-sectional nature of the phenomenon, more data is needed to prove that firm business adaptability changes over time. A longitudinal study is recommended.

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Practical Strategies for The Economic Development of Mexico: Nearshoring Trend

Estrategias prácticas para el desarrollo económico de México: tendencia del nearshoring

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ABSTRACT

This research aimed to suggest practical strategies for Mexico's economic development through the trend of nearshoring. It involved identifying, analyzing, and organizing the causes of the conflict between China and the USA over international trade and exploring the opportunities that nearshoring to Mexico can offer. Qualitative research methods were applied, and documentary research techniques were used based on two study objects: a) the Sino-American dispute over international trade and b) nearshoring to Mexico. Nearshoring to Mexico is driven by various factors, including tariff benefits from Free Trade Agreements, low labor costs in manufacturing companies, and a stable exchange rate. Therefore, Mexico needs to encourage the development of industrial parks, implement an effective Public Security Policy, offer tax incentives to attract Foreign Direct Investment and improve port, road, and air infrastructure to take full advantage of this trend.

Keywords: International trade, Nearshoring, Foreign Direct Investment

JEL code: F10, F63

RESUMEN

Esta investigación tuvo como objetivo sugerir estrategias prácticas para el desarrollo económico de México a través de la tendencia del nearshoring. Implicó identificar, analizar y organizar las causas del conflicto entre China y Estados Unidos sobre el comercio internacional y explorar las oportunidades que puede ofrecer el nearshoring a México. Se aplicaron métodos de investigación cualitativos y se utilizaron técnicas de investigación documental basadas en dos objetos de estudio: a) la disputa chino-estadounidense sobre el comercio internacional y b) el nearshoring a México. El nearshoring a México está impulsado por varios factores, incluidos los beneficios arancelarios de los Tratados de Libre Comercio, los bajos costos laborales en las empresas manufactureras y un tipo de cambio estable. Por lo tanto, México necesita fomentar el desarrollo de parques industriales, implementar una Política de Seguridad Pública efectiva, ofrecer incentivos fiscales para atraer Inversión Extranjera Directa y mejorar la infraestructura portuaria, vial y aérea para aprovechar al máximo esta tendencia.

Palabras clave: Negocios internacionales; Nearshoring; Inversión Extranjera Directa.

Código JEL: F10, F63

INTRODUCTION

This research analyzed the conflict over international commercial hegemony between China and the USA (Shen et al., 2023; Urdinez et al., 2016) and the opportunities that nearshoring to Mexico generates (Pietrobelli & Seri, 2023). Based on this, alternatives were proposed to take advantage of new trends.

The method used in the diagnosis to collect information was documentary research techniques (Dźwigoł & Trzeciak, 2023). Two qualitative variables were identified for observation and analysis: a) the Sino-American dispute for international commercial hegemony (Lukin, 2023) and b) nearshoring to Mexico (Gómez-Rocha et al., 2024).

What has been exposed throughout this investigation can be established that the causes of the dispute over hegemony over international trade between China and the USA are due to the following: a) China's preponderance in global exports with 14.2% and the USA with 8.3% in 2019; b) China serves as the first trading partner of 70% of the countries in the world; c) The USA has a trade deficit with China of more than 300 billion dollars each year; d) Chinese investments derived from the three silk routes reduce the competitiveness of the USA; d) China and Russia propose two international payment systems to avoid the hegemony of SWIFT; e) China catapults as the second most crucial economy based on GDP. (PINWEST, 2022)

Additionally, the aspects that explain Mexico's attractiveness for business relocation are a) the increase in Foreign Direct Investment, b) the tariff benefits that companies located in Mexico can access due to the Free Trade Agreements that have been signed (Ornelas & Turner, 2024), c) the Minimum Wage to be paid in manufacturing companies is low compared to other countries (Azar et al., 2023); and d) stable exchange rate due to the increase in remittances, tourism income, oil income and the difference in the interest rates of the central bank of Mexico with inflation (Adebayo et al., 2023).

DEVELOPMENT

International Trade

International trade is the set of commercial transactions between private individuals residing in different countries. Unlike internal trade, where commercial transactions are carried out within a relatively homogeneous economic, monetary, and legal space, international commercial transactions occur between private commercial operators in different legal systems and with marked economic and social differences (Huesca, 2012; Barberi, 2024).

Currently, international trade is a fundamental part of the world economy. It represents an essential source of income and employment for many nations through various modalities, such as exporting and importing goods and services, foreign direct investment, and granting licenses and franchises. It is also governed by international rules and agreements, such as free trade agreements, the World Trade Organization (WTO) rules, and other bilateral and multilateral agreements.

International trade offers benefits such as diversification of production and access to new markets. However, it can also create challenges and imbalances, such as unfair competition and vulnerability to fluctuations in international markets. International trade is considered an essential tool for promoting the economic development of countries and their citizens.

Nearshoring

"Nearshoring" is the English expression used to refer to companies' strategy to manufacture closer to the market where they sell their products. If decades ago, the trend was "offshoring" (taking factories to China to produce cheaper), now the trend is a return to closer geographical areas. The objective of nearshoring is to reduce costs and improve efficiency while minimizing risks and maintaining high levels of quality and control through more excellent geographic proximity, a minor time difference, greater ease of project management, and a more significant cultural and linguistic similarity between the parties involved.

METHODOLOGICAL CONSIDERATIONS

Problem Statement

The trade confrontation between the two largest economies in the world, the United States and China, goes beyond a mere trade war with tariffs, tariffs, and sanctions against each other. What is in conflict is the hegemony of international trade and the influence on economies in the rest of the planet. China leads exports of goods and services to the rest of the world, representing 14.2% in 2019 compared to the United States, with 8.3% in the same year. Furthermore, China serves as the first trading partner of 70% of the world's countries, reducing the preponderance of the USA. Additionally, the USA has a deficit with China of 316 billion dollars in 2020 alone, meaning that it imports more than it exports (OEC, 2021). Therefore, this explains the interest in relocating American companies to allied countries, including Mexico.

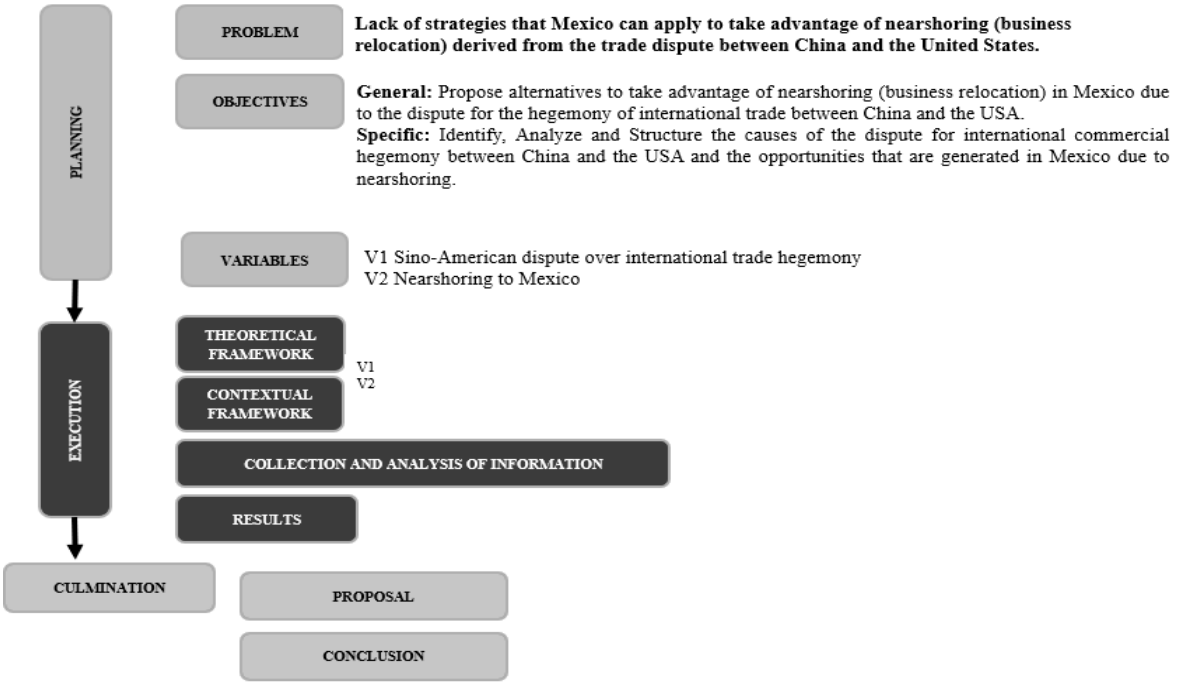
Based on the arguments described, this research aims to analyze the context of the trade dispute between the United States and China and propose strategies to maximize the nearshoring trend (business relocation) to Mexico.

RESEARCH METHOD

The method used in the diagnosis to collect information was documentary research techniques. Two qualitative variables were identified: the Sino-American dispute for international trade hegemony and nearshoring to Mexico. These variables were subjected to observation and analysis without the support of any qualitative data analysis software to propose strategies for taking advantage of nearshoring.

Therefore, we initially proceeded to identify the categorical similarities between the case studies to achieve the following objectives: 1) Identify the causes of the dispute for hegemony over international trade between China and the USA and the opportunities nearshoring towards Mexico offers. 2) Analyze the causes of the dispute for hegemony over international trade between China and the USA and the opportunities that nearshoring (business relocation) to Mexico provides. Moreover, 3) Structure the causes of the dispute for hegemony over international trade between China and the USA and the opportunities that nearshoring (business relocation) to Mexico provides.

Figure 1
Methodological scheme used.



Source: Own elaboration.

For this purpose, a contrast was made between several reports in which the causes of the dispute for hegemony over international trade between China and the USA and the opportunities that business relocation to Mexico provides were analyzed. Based on this, Figure 1 shows the research method used to explain the behavior of the object of study and the corresponding variables.

RESULTS

Sino-American dispute over international trade hegemony

For the development of the research, the following arguments have been detected that explain the loss of US hegemony in international trade:

a) Preponderance of China in international trade

As can be seen in Table 1, in two decades, China has tripled its position in terms of exports worldwide with 14.2%, and not even the United States, Canada, and Mexico together equal the Chinese volume so we can see the loss of commercial supremacy of the United States. Moreover, regarding imports, China has become an increasing consumer market, from 2.6% in 2000 to 8.7% in 2019 globally.

Table 1

Representation of exports worldwide in 2000 and 2019

	EXPORTS				IMPORTS			
	2000		2019		2000		2019	
COUNTRIES	X Billions USD	% X	X Billions USD	% X	I Billions USD	% X	I Billions USD	% I
CHINA	307	4.9%	2570	14.2%	163	2.6%	1580	8.7%
USA	777	12.4%	1510	8.3%	1140	18.2%	2380	13.1%
GERMANY	522	8.4%	1440	8.0%	454	7.3%	1160	6.4%
JAPAN	483	7.7%	696	3.8%	342	5.5%	654	3.6%
UNITED KINGDOM	282	4.5%	446	2.5%	344	5.5%	664	3.7%
FRANCE	295	4.7%	558	3.1%	309	4.9%	643	3.6%
INDIA	46.3	0.7%	330	1.8%	46.4	0.7%	474	2.6%
BRAZIL	57.6	0.9%	230	1.3%	58.9	0.9%	177	1.0%
CANADA	268	4.3%	431	2.4%	231	3.7%	443	2.4%
MEXICO	164	2.6%	480	2.7%	150	2.4%	433	2.4%
OTHERS	3048.1	48.8%	9409	52.0%	3011.7	48.2%	9492	52.4%
TOTAL	6250	100.0%	18100	100.0%	6250	100.0%	18100	100.0%

Source: Own elaboration (OEC, 2021).

As shown in Figure 2, China was the leading trading partner in imports in more than 70% of the world's countries as of 2018—the exact representation that the USA had in 2000. So, you can see that the United States's economic hegemony has been lost in two decades.

Figure 2
Countries in which China is the first trading partner in imports.

Source: Gil (2020)

b) Large US trade deficit with China

As shown in Table 2, the United States has had a general trade deficit (exports minus imports), and China has been the primary beneficiary of the trade exchange. It explains the interest of the North American government in reducing the trade deficit with the Asian giant by imposing tariffs of up to 25% on imports from China in 2018, in addition to reducing dependence on imports of strategic items such as microchips, for example. So many companies looked for a way to replace "Made in China" with "Made in Mexico." It is why Mexico resumed a strategic role promoted by the T-MEC (Free Trade Agreement between the United States, Mexico, and Canada) (Li et al., 2020).

Table 2
United States Trade Balance
USA

	Trade Balance					
YEAR	**X BDD**	**M BDD**	**TB BDD**	**Mexico**	**China**	**Canada**
2020	$ 1,340	$ 2,240	-$ 900	-$ 129.16	-$ 314.86	-$ 47.24
2019	$ 1,510	$ 2,370	-$ 860	-$ 124.68	-$ 325.99	-$ 59.16
2018	$ 1,540	$ 2,420	-$ 880	-$ 103.62	-$ 385.70	-$ 54.34
2017	$ 1,450	$ 2,230	-$ 780	-$ 96.37	-$ 332.07	-$ 45.63
2016	$ 1,350	$ 2,060	-$ 710	-$ 84.62	-$ 291.34	-$ 42.49
2015	$ 1,390	$ 2,120	-$ 730	-$ 88.37	-$ 312.63	-$ 50.04

Source: Own elaboration (OEC, 2021).

The USA's protectionist measures, aggressive use of export controls, and industrial policy have been aimed primarily at China. The US-China trade war that began in 2018 is estimated to have increased average bilateral tariffs by 17 %, disrupting supply chains and creating uncertainty (Bekkers & Schroeter, 2020). Another US response is to privilege reliable trade partners by nearshoring, friend-shoring, or other measures. Although implementation has been limited so far, beyond the recrafting of the North American Free Trade Area, the concept of discriminating in favor of some WTO members at the expense of others is contrary to the fundamental principle set out in Article I of the WTO Charter that all members must be treated as well as the most-favored-nation (Pomfret, 2023).

c) The three silk routes

As shown in Figure 3, China has been developing strategic infrastructure such as seaports, airports, and highways in different countries to facilitate trade exchange. Three routes emerge maritime, land, and arctic. Highlighting the latter with a reduction in time, distance, and logistical costs, for example:

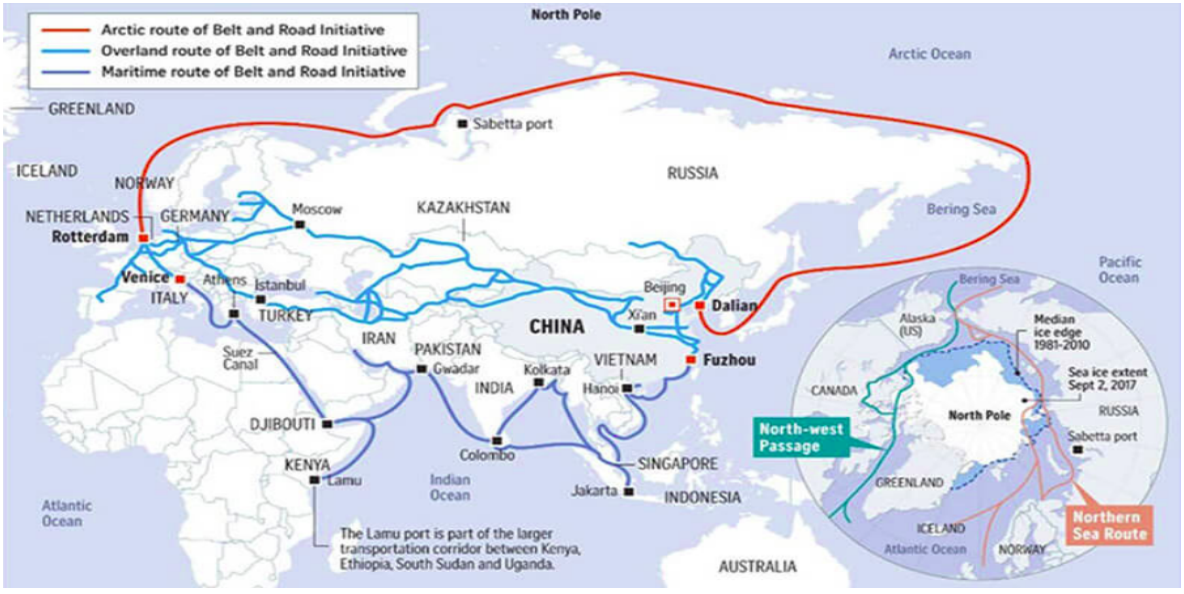
1) The traditional route from Vladivostok to Saint Petersburg is 23,000 km, which is traveled in 52 days, but when using the Arctic route, the distance and time are reduced to 14,000 km and 31 days.

2) The traditional route from Tokyo to Rotterdam is 21,000 km, which is traveled in 47 days while using the Arctic route reduces the distance and time to 13,000 km and 29 days.

3) The traditional route from Dalian to Rotterdam is 20,000 km and takes 45 days while using the Arctic route reduces the distance and time to 15,000 km and 32 days.

Figure 3

China has been developing strategic infrastructure: Silk Roads

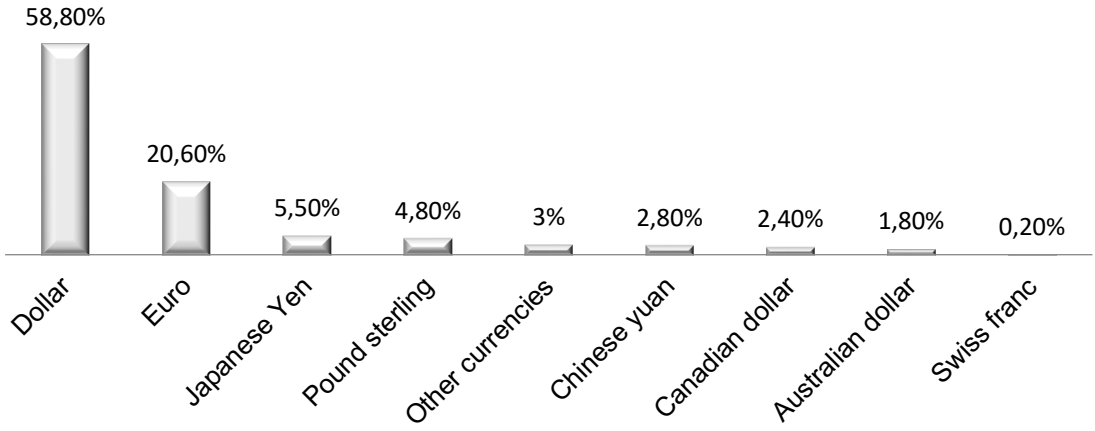


Source: (Fuster, 2021)

d) SWIFT vs CIPS y SPFS

As can be seen in Graph 1, the American dollar maintains great hegemony as a reserve currency, which has been reduced due to the sanctions imposed on Russia for the war in Ukraine, a country that was excluded from SWIFT (Society for World Interbank Financial Telecommunication) and its reserves in dollars were frozen, which are estimated at 300 million dollars, so the Russian government cannot access that capital and due to the fear of other countries derived from this, they have sought to reduce their reserves in the American dollar and use their currencies in international trade through the CIPS (Cross-Border Interbank Payment System) promoted by China and the SPFS (Financial Message Transfer System) controlled by Russia, to prevent their transactions from being frozen since sanctions disrupted Russia's trade with the rest of the world, which had severe implications for sanctions-imposing and other countries' businesses, the consequences of these sanctions extended beyond the geopolitical arena, affecting businesses and investors worldwide (Abakah et al., 2024).

Graph 1
Most Used Reserve Currencies (billions USD, 2021)

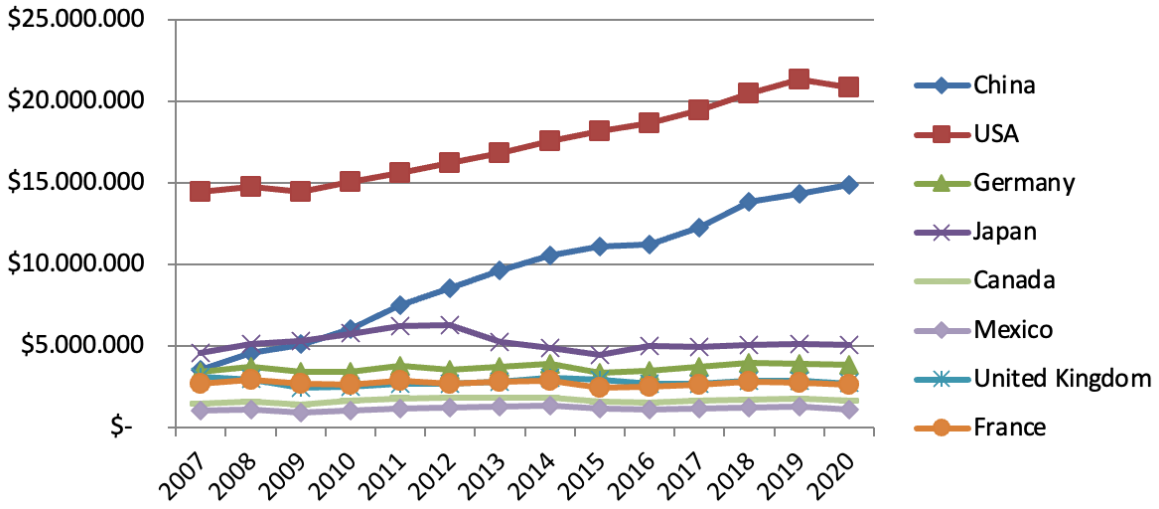


Source: Marín (2022).

e) Comparison of countries based on GDP

As shown in Graph 2, the USA has held the leadership for decades by serving as one of the most important economies worldwide without any competition. However, since 2011, China has had constant growth that has maintained the trend, which could replace the United States as the leading world power before 2030.

Graph 2
GDP growth of the leading countries



Source: Expansión (2021).

As Table 3 shows, China was the only country with growth in 2020, which allowed it to recover faster in the reactivation of foreign trade. It explains that while container ships arrived and were stacked in American and European ports to be unloaded, they returned empty to China, further causing a shortage of containers and increased freight rates.

Table 3
GDP growth by country

COUNTRIES	2016	2017	2018	2019	2020
CHINA	6.8%	6.9%	6.7%	6.1%	2.3%
USA	1.7%	2.3%	2.9%	2.3%	-3.4%
GERMANY	2.2%	2.7%	1.3%	0.6%	-4.6%
JAPAN	0.8%	1.7%	0.6%	0.3%	-4.6%
UNITED KINGDOM	1.7%	1.7%	1.3%	1.4%	-9.7%
FRANCE	1.1%	2.3%	1.9%	1.8%	-7.9%
INDIA	7.1%	6.7%	6.5%	4.0%	-7.3%
BRAZIL	-3.3%	1.3%	-1.3%	1.4%	-4.1%
CANADA	1.0%	3.0%	2.4%	1.9%	-5.3%
MEXICO	2.6%	2.1%	2.2%	-0.1%	-8.3%

Source: Own elaboration (Expansión, 2021).

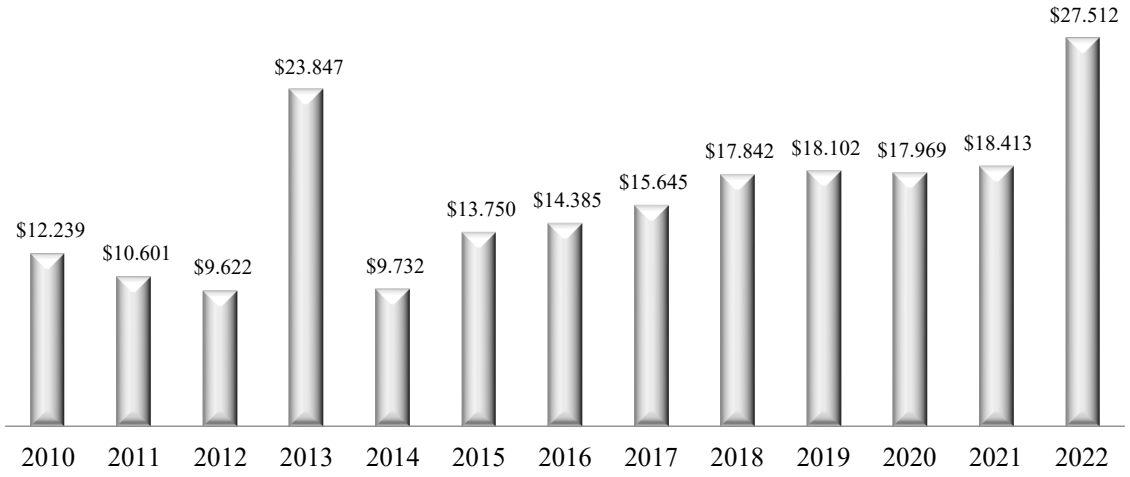
NEARSHORING TO MEXICO

Several of the factors that favor Mexico's attractiveness for business relocation are the following:

a) Foreign Direct Investment

Foreign Direct Investment in the first half of 2022 was 49.2% higher than the first half of 2021 (graph 3). However, this percentage considers the merger of Televisa and Univision and the restructuring of Aeromexico for $6,875 million. Without considering these atypical operations, FDI increased by 12% compared to the previous year's first half. It is worth mentioning that in 2013 there was a significant increase due to the sale of Grupo Modelo, which was close to $13,000 million (López, 2022). All of this denotes that Mexico, given foreign investors, is attractive for investment and its strategic position. It is why Tesla invested $5,000 million in 2023 to develop a Gigafactory in Nuevo León, Mexico.

Graph 3
Foreign Direct Investment in the first semester

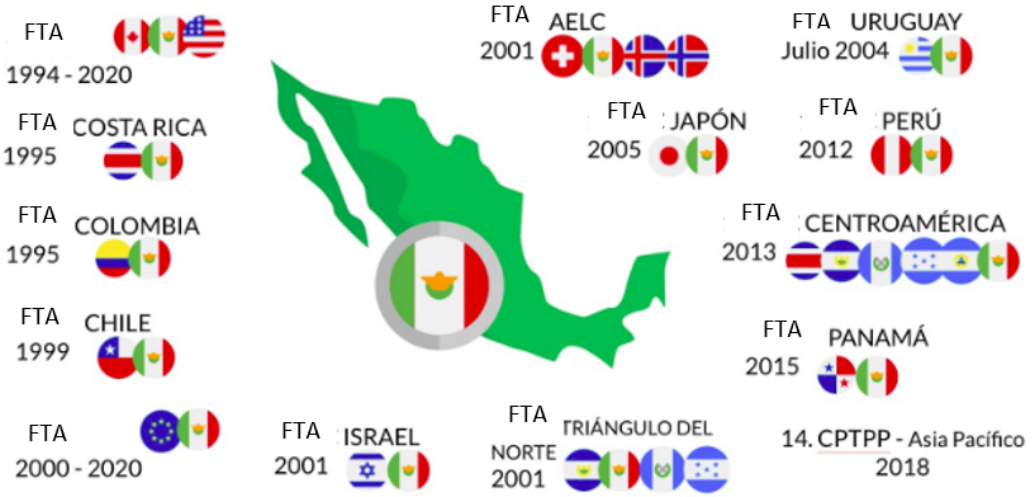


Source: Own elaboration (Secretaría de Economía, 2022).

b) Free Trade Agreements and Trade Agreements signed by Mexico

As seen in Figure 4, Mexico has 13 Free Trade Agreements (FTAs) with 46 countries. Likewise, it is affiliated with the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Pacific Alliance (PA). Therefore, Mexico is attractive for relocating foreign companies because they can access their goods in those countries with tariff preferences granted by the FTAs.

Figure 4
Free Trade Agreements and Trade Agreements signed by Mexico.

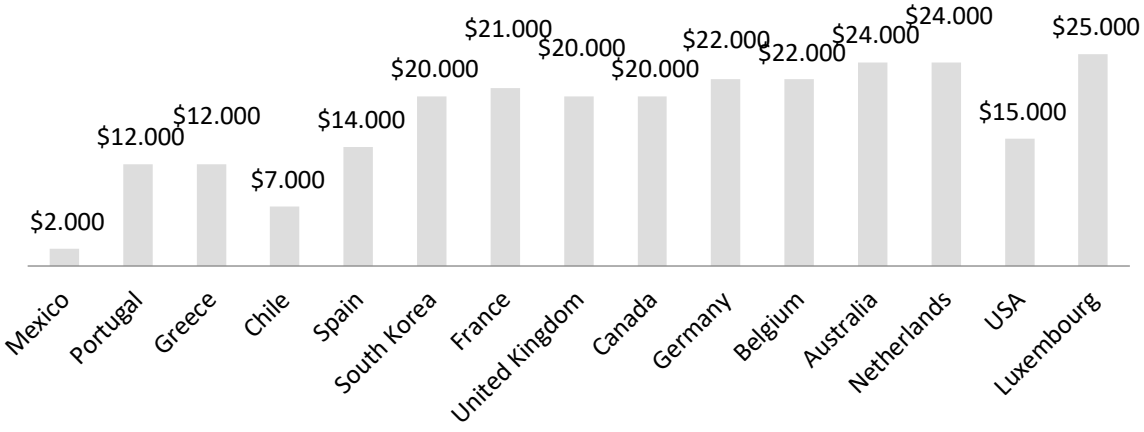


Source: Mundi (2022).

c) Comparison of minimum wages

As Graph 4 shows, the actual minimum salary in Luxembourg is USD 25,000 per year in Purchasing Power Parity (PPP). In contrast, the minimum wage in Mexico is USD 2,000 per worker.

Graph 4
Comparison of minimum wages



Source: Own elaboration (Merino, 2020)

d) Remittances

As shown in Table 4, Mexico has had historical records for the receipt of remittances, even in the pandemic years, in which annual increases were recorded, which compared to the years 2008 and 2009 had a reduction of -15.3 % due to the real estate crisis in the USA.

Table 4

Income from remittances. January-December of each year.

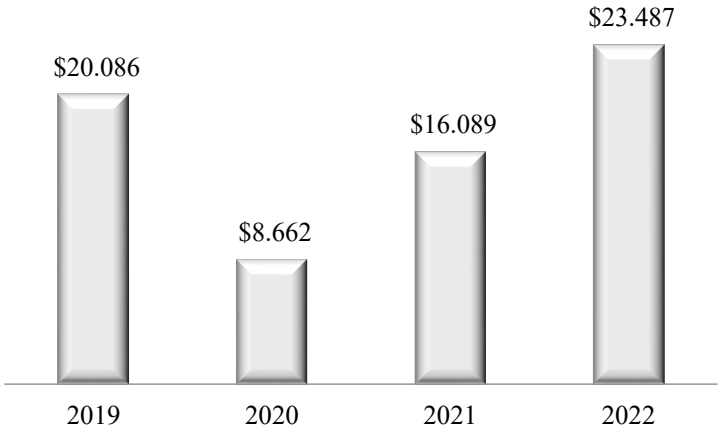
YEAR	REMITTANCES IN USD	VARIATION
2007	$ 26,059	1.9%
2008	$ 25,145	-3.5%
2009	$ 21,306	-15.3%
2010	$ 21,304	0.0%
2011	$ 22,803	7.0%
2012	$ 22,438	-1.6%
2013	$ 22,303	-0.6%
2014	$ 23,647	6.0%
2015	$ 24,785	4.8%
2016	$ 26,993	8.9%
2017	$ 30,941	14.6%
2018	$ 33,677	8.8%
2019	$ 36,439	8.2%
2020	$ 40,605	11.4%
2021	$ 51,594	27.1%
2022	$ 58,497	13.4%

Source: Own elaboration (Banxico, 2023).

e) Tourism Income

As shown in Graph 5, according to INEGI figures, between January and November, the inflow of tourist currency reached 23,487 million dollars, an increase of 3,300 million dollars more than previous numbers, due to the pandemic. Additionally, the entry of international tourists as of November 2022 remains 15.5% below pre-pandemic figures, that is, 40.31 million in 2019, 21.66 million in 2020, 28.18 million in 2021 and 34.07 million in 2022 (Munguía, 2023).

Graph 5
Expenditure of International Tourists, January-November, thousands of dollars

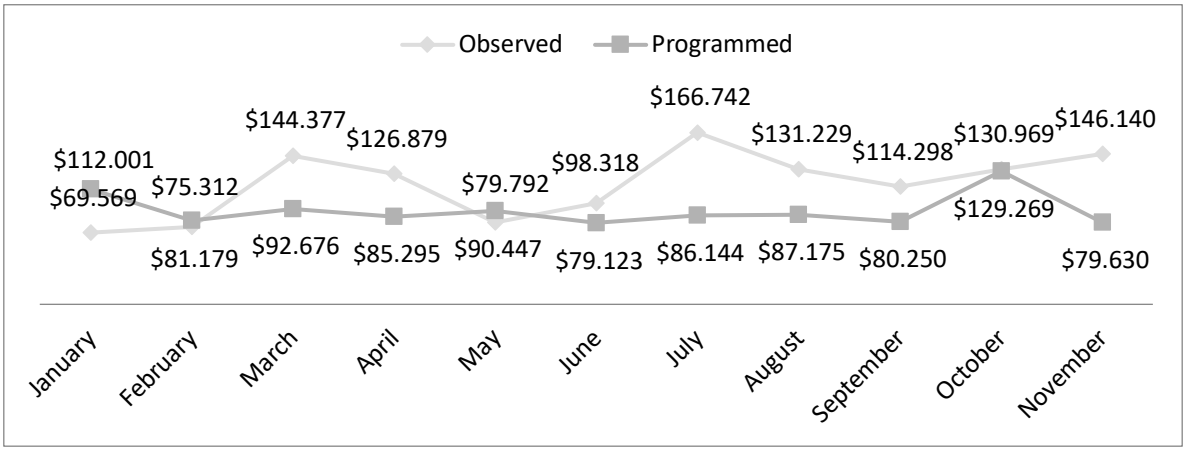


Source: Own elaboration (Munguía, 2023)

f) Mexican Oil Revenues

As shown in Graph 6, another factor that has contributed to the macroeconomic stability of Mexico is oil revenues, which have benefited from the war between Russia and Ukraine, as the former is one of the leading exporters of oil. Oil worldwide has led to an increase in the price of a barrel derived from the sanctions imposed on Russia by the West. Therefore, there is a marked difference between what was programmed and what was observed, granting the Mexican coffers an additional income of 280,436 million pesos in that period alone.

Graph 6
Oil Revenues (Millions of pesos)



Source: CEFP (2023).

g) Central Bank Interest Rates

As shown in Table 5, the interest rates of the Central Bank of Mexico offered through CETES versus inflation give the national and foreign investor profits of 2.59% compared to the USA

and Argentina as an extreme case, since they are countries in which it is not attractive to invest in the government due to the loss they generate.

Table 5

Comparison of Central Bank Interest Rates and Inflation

	MEXICO			USA			ARGENTINA		
PERIOD	****IR *CB**	***** CPI**	**Difference %**	**IR CB**	**CPI**	**Difference %**	**IR CB**	**CPI**	**Difference %**
JANUARY-23	10.50 %	7.91 %	2.59%	4.25 %	6.40 %	-2.15%	75%	98.8 %	-23.80%

*CB: Central Bank **IR: Interest Rate *** CPI: Consumer's price index

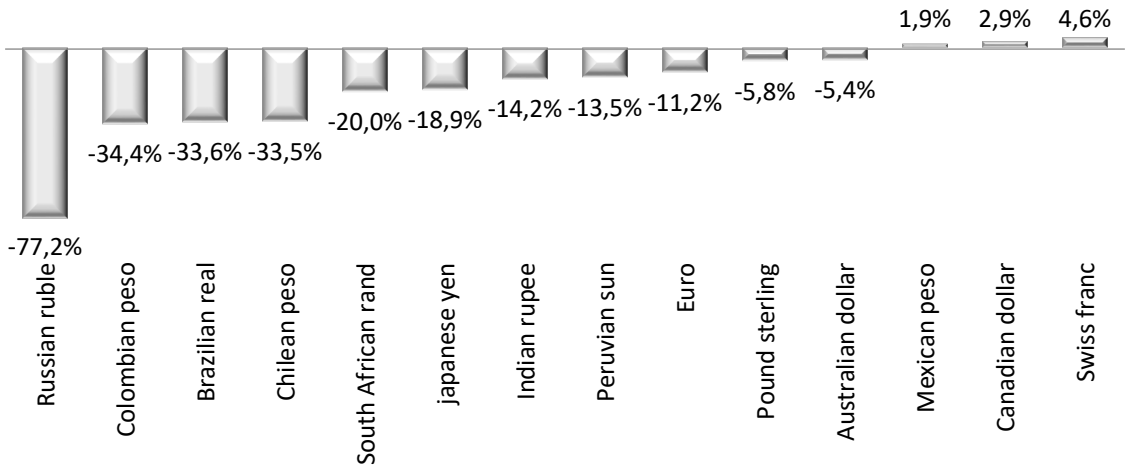
Source: Own elaboration (Expansión, 2021).

h) Exchange rate concerning the dollar

As seen in Graph 7, the Mexican peso exchange rate concerning the US dollar has appreciated by 1.9% in the period considered from November 30, 2018, to August 17, 2022. This is explained by the increase in Foreign Direct Investment (FDI), remittances sent from the USA, the increase in exports, especially for oil, income from tourism, the difference in interest rates of the Central Bank of Mexico and inflation, and the risk that It could cause the United States to enter the war over Taiwan. That is why the exchange rate of the Mexican peso is at MXN 18.32 per USD 1 as of March 12, 2023.

Graph 7

Variation in the exchange rate concerning the US dollar by currency.



Source: Own elaboration (López, 2022).

PROSPECTIVE ANALYSIS

In recent years, Mexico has been seen as an attractive destination for the Nearshoring industry due to its strategic location, proximity to the United States, and young, highly trained workforce. This trend is expected to continue, driven by the growing need for companies to reduce costs and find solutions to the logistics and supply chain challenges caused by the COVID-19 pandemic.

Nearshoring is expected to continue to be an attractive option for companies seeking to establish a presence in the Latin American and Caribbean region, especially in the manufacturing, technology, and customer services sectors.

However, to ensure that Mexico can effectively take advantage of this opportunity, the Mexican government must continue to promote measures to improve the business environment and attract more foreign investment. These include improving infrastructure, reducing bureaucracy and paperwork, and promoting education and training to ensure the workforce is prepared for the demands of the Nearshoring industry.

US infrastructure plan: an opportunity for Mexico

US President Joe Biden celebrated the signing of the Infrastructure Plan in the USA, one of his greatest successes at the national level since his arrival at the White House. With this plan, he aims to transform the economy in the face of the effects of climate change (Hurtado, 2021).

Table 6

Infrastructure plan in the United States

Type of infrastructure	*Investment*
Roads and bridges	110,000 million USD
Public transport	39,000 million USD
Rail system	66,000 million USD
Electric vehicles	7,500 million USD
Electrical network	65,000 million USD
Drinking water	55,000 million USD
Ports and airports	110,000 million USD

Source: Hurtado (2021).

As seen in Table 6, the most important investments are the modernization of roads and bridges, followed by ports and airports. These are characterized by obsolete infrastructure that hinders the correct management of the supply chain. Analysts estimated that the US infrastructure plan approved by the US Senate will have a positive impact on the Mexican economy (Castañares & Hernández, 2021).

Ernesto O'Farrill, president of Grupo Bursametrica, pointed out that Mexican exports could double if the current administration takes advantage of all the opportunities that will arise with this plan and considered that business associations should push to design a strategy to attract investment and promote employment (Castañares & Hernández, 2021). Especially in large projects such as:

The Interoceanic Corridor of the Isthmus of Tehuantepec (CIIT), as of June 14, 2019, was published in the Official Gazette of the Federation, the Decree that creates the (CIIT), which will be the body responsible for implementing this Regional Program (SEGOB, 2018).

The largest industrial park or multimodal logistics hub in America, the TMex Park, in which it is estimated that 65,000 direct and indirect jobs will be created, which will promote entrepreneurship through an investment of 25,000 million pesos with a privileged location since it is located 3 kilometers from the new Felipe Ángeles International Airport (AIFA) (Arturi, 2022).

Train network, a project promoting the fourth transformation headed by President Andrés Manuel López Obrador, is intended to be completed in Mexico by 2050. It will have 11 future railway lines connecting the entire country by 2050. The routes would be: Train of the Pacific, with an extension of 4,700 kilometers; El Chepe (673 kilometers); Western Train (2,250 kilometers); Eastern Train (2.00 kilometers); Transversal Train (1,200 kilometers); Gulf Train (1,650 kilometers); Bajío Train (1,500 kilometers); Central Train (1,300 kilometers); Isthmus Train (300 kilometers); Oaxaca Train (750 kilometers) and the flagship work of the current government, the 1,800-kilometer Mayan Train (El economista, 2022).
Joel Virgen, director of analysis at Out of the Box Economics, considered that the benefit to the Mexican economy will become more evident in the medium term, mainly in sectors such as automotive and electronics, to mention a few (Castañares & Hernández, 2021).

Amín Vera, director of economic analysis at BW Capital, indicated that the plan directly benefits Mexican companies that operate as suppliers to the US construction sector or are part of the production chains that will improve the network of goods. These companies are public companies in that country, such as Cemex or Grupo Cementos Chihuahua (Castañares & Hernández, 2021).

> *"Seen from the GDP side, it would be industrial activity that would benefit the most, and seen by components of aggregate demand, exports would have a strong boost, generating surpluses in the trade balance, which tends to translate into a higher level of income for Mexico, benefiting its recovery,"* said Alain Jaimes, economic analyst at Signum. Research (Castañares & Hernández, 2021).

PROPOSALS

The Mexican government can propose various measures to take advantage of nearshoring in Mexico. Below are some possible proposals:

Promote the development of industrial parks: According to data from the Mexican Association of Private Industrial Parks (AMPIP), 47 new industrial parks began construction in Mexico in the last year alone, and estimates suggest that nearshoring will generate approximately US$30 billion in Mexico in 2022 (Barría, 2023).

Accelerate Public Security Policy strategies such as a) Crime prevention and reconstruction of the social fabric; b) Effective Criminal Justice; c) Professionalization and strengthening of police forces; d) Transformation of the penitentiary system; e) Promotion and articulation of citizen participation; f) International cooperation; g) Information that serves the citizen; h) Coordination between authorities; i) Regionalization; and j) Strengthening intelligence (Gobierno de Mèxico, 2013).

Strengthen the judiciary's autonomy to guarantee a legal framework for investments by national and foreign companies.

Offer tax incentives to attract Foreign Investment by promoting development programs such as the Manufacturing, Maquiladora, and Export Services Industry Program (IMMEX) and Sector Promotion Programs (PROSEC) (Kravtsova, 2010).

Training and training of the workforce: The government could implement training and education programs to ensure that Mexico has a trained and specialized workforce in the sectors that will benefit most from Nearshoring. It could include creating technical and vocational education programs and collaborating with companies to offer specific training in the skills required for the industry.

Infrastructure improvement: The Mexican government could improve the infrastructure necessary to attract companies seeking to use Nearshoring. This could include modernizing roads, ports, and airports, improving high-speed internet connectivity, and providing energy and water resources.

CONCLUSION

This research aimed to propose strategies derived from the trend called nearshoring (business relocation) to Mexico, which can maximize the country's economic development. All this is from the application of the qualitative method since documentary research techniques were used based on the variables or objects of study: a) the Sino-American dispute for international trade hegemony and b) nearshoring to Mexico. Additionally, it was vitally important to identify, analyze and structure the causes of the conflict over international trade hegemony between China and the USA, which were due to the following: a) The preponderance of China in exports globally with 14.2% and the USA with 8.3% in 2019; b) China serves as the first trading partner of 70% of the countries in the world; c) The USA has a trade deficit with China of more than 300 billion dollars each year; d) Chinese investments derived from the three silk routes reduce the competitiveness of the USA; e) China and Russia propose two international payment systems to avoid the hegemony of SWIFT; f) China is catapulted as the second most crucial economy based on GDP.

Likewise, the aspects that explain Mexico's attractiveness for nearshoring are 1) The increase in Foreign Direct Investment; 2) The tariff benefits that companies located in Mexico can access due to the Free Trade Agreements that have been signed; 3) The Minimum Wage to be paid in manufacturing companies is low compared to other countries; and 4) Stable exchange rate due to the increase in remittances, tourism income, oil income and the difference in the interest rates of the central bank of Mexico with inflation.

Therefore, to take advantage of this phenomenon, Mexico proposes encouraging the development of industrial parks, accelerating public security policy strategies, offering tax incentives to attract foreign direct investment, and improving port, road, and air infrastructure.

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The Delphi Method and Scientific Research

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Science has evolved to think about space, time, and the relations of subject and object, as a highly abstract regulatory idea and not just as a synonym for models and norms to be followed. The paths of science must guarantee all agreements, those based on procedures using philosophy and mathematical concepts to explain reality (positivism) and those based on principles to understand and interpret social phenomena in their reality, relationships, values, attitudes, beliefs, habits, and representations.

Qualitative research deals with the level of reality that cannot or should not be quantified, it works with the universe of meanings, motives, aspirations, values, and attitudes. This level of reality is not visible, the researcher must expose it, (Minayo, 2009).

In the exact sciences, future events can be predicted objectively from existing explanations: explanation and prediction have the same logical structure. The future depends not only on the past but also on the image of the future formed in the present by those who carry out actions. The Delphi method has been used for predictions in topics or areas that require the flexibility of well-informed human judgment, to process diverse and unstructured information.

The Delphi method has been used in defense, health, tourism, education, and business fields. Science in general requires a prediction methodology different from the one used to make explanations in the exact sciences, thus justifying the consideration of some methodological innovations for the realization of predictions, such as the systematic use of expert judgment, simulation processes, and operational games.

The subjective judgment of experts in non-exact disciplines is justified in situations of uncertainty, when the problem is very complex, when the evidence is insufficient, unpublished, or when objective information is lacking (Jones & Hunter, 1995). The Delphi technique seeks to obtain the degree of consensus or agreement of specialists on the problem

posed, using the results of previous research, instead of leaving the decision to a single professional (Varela-Ruiz, Díaz-Bravo & García-Durán, 2012).

The Delphi method is classified as one of the general methods of foresight, which seeks to approach the consensus of a group of experts based on the analysis and reflection of a defined problem. (Varela-Ruiz, Díaz-Bravo & García-Durán, 2012). The defined problem is presented in a formal proposal that should include a brief description of the project, the objectives it pursues, the expected number of rounds, and the estimated time of the process, (Gordon, 1994).

The Delphi method has proven to be a robust method of scientific research despite some limitations and difficulties being discussed in the literature. The development and dissemination of the Delphi method have been growing and exponential, reaching an outstanding projection in different areas of knowledge, (Cabero & Infante, 2014; Maxey & Kezar, 2015).

The Delphi method is a qualitative technique, although there are authors who argue that it is mixed, and others believe that in its final phase, it is quantitative (Sekayi & Kennedy, 2017). The method allows you to know the opinion of a group of experts, which is called a panel, addressing a specific problem in a structured way, the interaction between the different members is carried out through a questionnaire, (McMillan, King & Tully, 2016; Diamond, *et al.* 2014).

In the 1950s, in Santa Monica, United States, experts from the RAND Corporation, an acronym for Research and Development, sponsored by the U.S. Air Force in order to investigate the impact of technology on war, carried out the Delphi project, which consists of using the judgment of experts about specific events or topics. The name Delphi in English translation is Delphi, its name endorses its initial predictive use that alludes to the sanctuary of Apollo, a sacred and famous place, which functioned as an oracle, and where the fortune teller transmitted the answers of the god to the questions that were asked.

The results of the RAND research, presented in the report: On the Epistemology of the Inexact Sciences, published by The Institute of Management Science, in which seven experts were asked about the future of the U.S. arsenal. The report concludes that prediction based on expert opinion is acceptable in disciplines that are not sufficiently developed to have scientific laws (Helmer & Rescher, 1959).

Methodological foundations of Delphi. The development of the Delphi method made its way into a landscape dominated by positivist thinking. The method must guarantee anonymity, establish an iterative process through feedback, and the group's response must be oriented towards a measure. The research carried out by Ernesto López-Gómez, (2018), mentions that

the fundamental methodological parameters to be considered in its development are the following:

1. Selection and composition of the panel of experts
2. Number of experts
3. Panel Quality
4. Iterative process in rounds
5. The criteria of consensus and stability for the completion of the process

Selection and shaping. The selection and composition of the panel of experts guarantee the quality of the process and its results. The researcher must identify potential experts under inclusion criteria since a random or unsubstantiated selection is not acceptable. The research problem and the very nature of the study condition the profile of the experts, specialists, or facilitators in the panel to be formed.

In the research carried out by Pill (1971), he mentions that to delimit the requirements and attributes, the possible expert candidate must have background, experience in the subject to be addressed and disposition. Steurer (2011) proposes nominating as experts those who have more than five publications on the chosen topic in a couple of journals during the last three years. However, authors such as Kennedy (2004) & Price (2005) consider it problematic to define an expert only as a specialist in his or her field, so it is also important to take into account practice-based knowledge and up-to-date experience.

Panel quality. Quality can be measured using different techniques, methods, or procedures to estimate the level of expert knowledge (Landeta & Landeta Rodriguez, 1999; Blasco, López & Mengual, 2010), taking into account indirect indicators such as publications on the subject, citations received, years of experience, training, positions held, dedication and professional trajectory. The quality of the panel is justified based on the criteria applied in the process of selecting and forming experts. The group that makes up the panel endorses quality with the background of the experts, their professional training, the research carried out, and the professional experience (López-Gómez, 2018).

Iterative process in rounds. The iterative process consists of the controlled exchange of information between the person applying the Delphi model and the experts who make up the panel. The iteration is organized in rounds, carrying out the study through interrogations through a questionnaire designed and elaborated, taking into account the object and objectives of the research. In most applications, the Delphi method is developed in two rounds, usually in three, and rarely in more, (Steurer, 2011).

Completion of the Delphi. The criteria for finalizing Delphi must consider the measure of consensus and stability in the panel's responses, which guide data analysis and decision-

making. Consensus, in the study carried out by Esther Martínez Piñeiro (2003), mentions that consensus responds to the philosophy of the technique itself, since its main objective is, precisely, the convergence between the opinions of the participants. In achieving consensus of expert opinions, there is no universal reference, however, in the research carried out by (Pozo, Gutiérrez & Rodríguez, 2007), the degree of convergence of individual estimates must coincide at a minimum of 80%.

The Internet and the Delphi Method. The use of the internet facilitates the application of the method, eliminating geographical distance, facilitating, and allowing the participation of a greater number of experts, maintaining the anonymity of the participants, also, avoiding the influence of the answers of any member of the panel, in addition to being economical, (Humphrey-Murto, *et al.* 2017).

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)

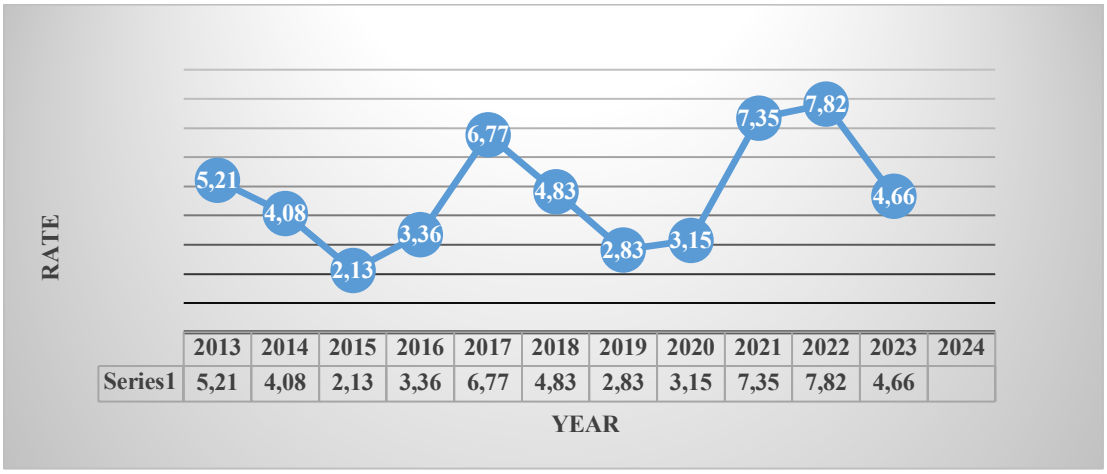
Born in 1995 and reflecting changes in consumer prices, it measures the general increase in prices in the country. It is calculated fortnightly by the Bank of Mexico and INEGI (2021). INPC is published in the Official Gazette of the Federation on the 10th and 25th of each month. The reference period 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	
May	0.95	0.91	-0.26	0.20	2.92	0.73	0.21	0.22	2.88	3.17	1.27	
June	1.12	1.09	-0.09	0.31	3.18	1.12	0.27	0.76	3.43	4.04	1.37	
July	1.14	1.42	0.06	0.57	3.57	1.66	0.65	1.43	4.04	4.81	1.86	
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	

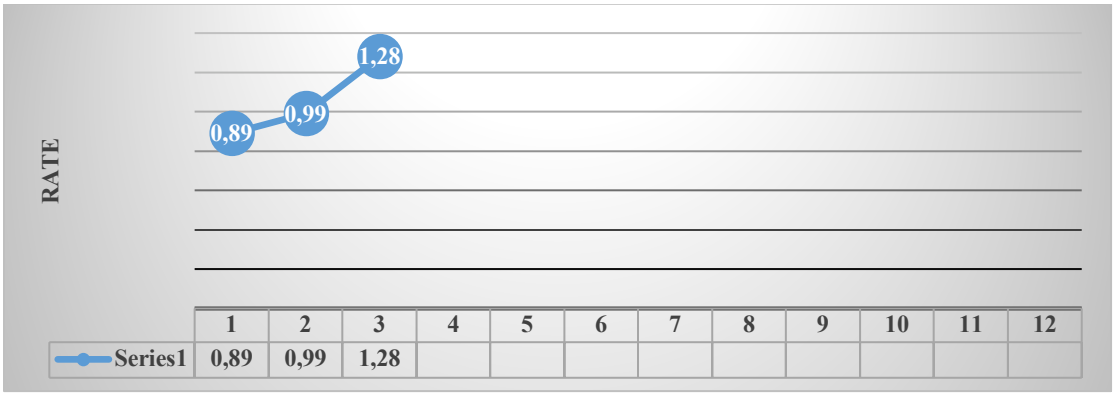
Source: Own elaboration (INEGI, 2024). Route: Indicadores económicos de coyuntura > Índices de precios > Índice nacional de precios al consumidor. Base segunda quincena de julio de 2018=100 > Mensual > Índice > Índice general

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-March 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)

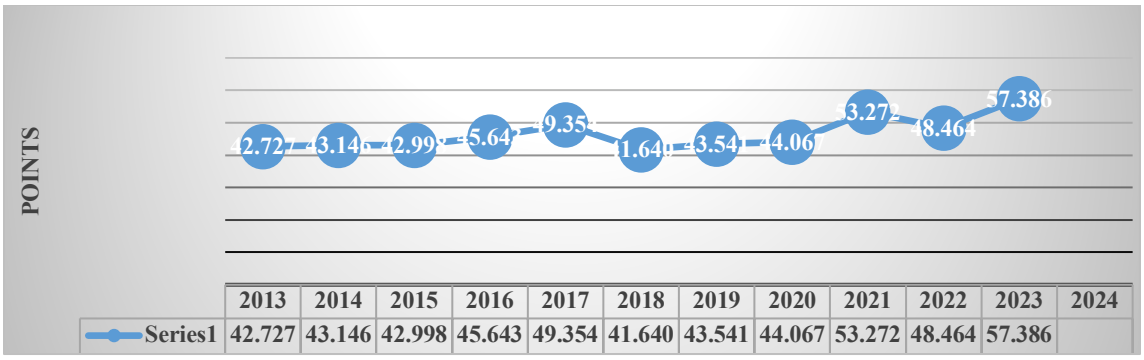
Represents the change in the values traded on the Mexican Stock Exchange concerning the previous day to determine the percentage of rising or falling of the most representative shares of the companies listed therein.

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	
June	40,623	42,737	45,054	45,966	49,857	47,663	43,161	37,716	50,290	47,524	53,526	
July	40,838	43,818	44,753	46,661	51,012	49,698	40,863	37,020	50,868	48,144	54,819	
August	39,492	45,628	43,722	47,541	51,210	49,548	42,623	36,841	53,305	44,919	53,021	
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	

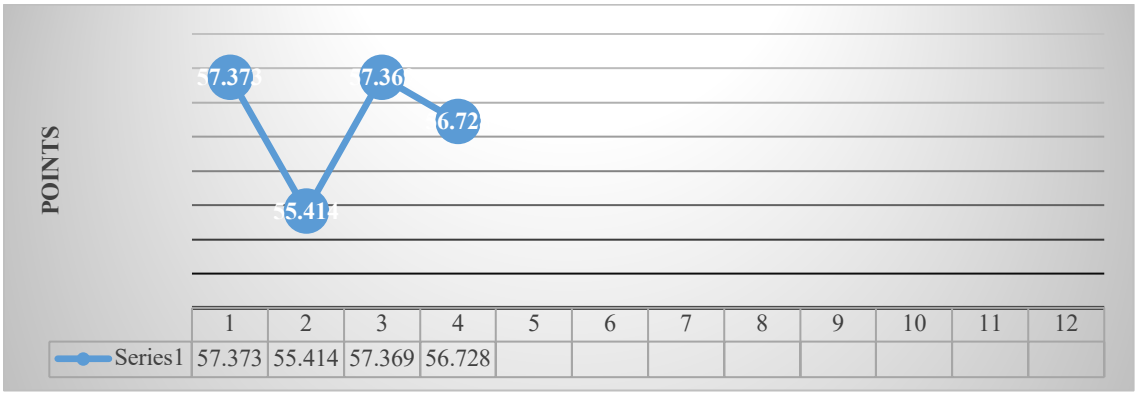
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=7&accion=consultarCuadro&idCuadro=CF57&locale=es

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-April 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 concerning the dollar calculated with the daily average of the five most important banks in the country, which 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)

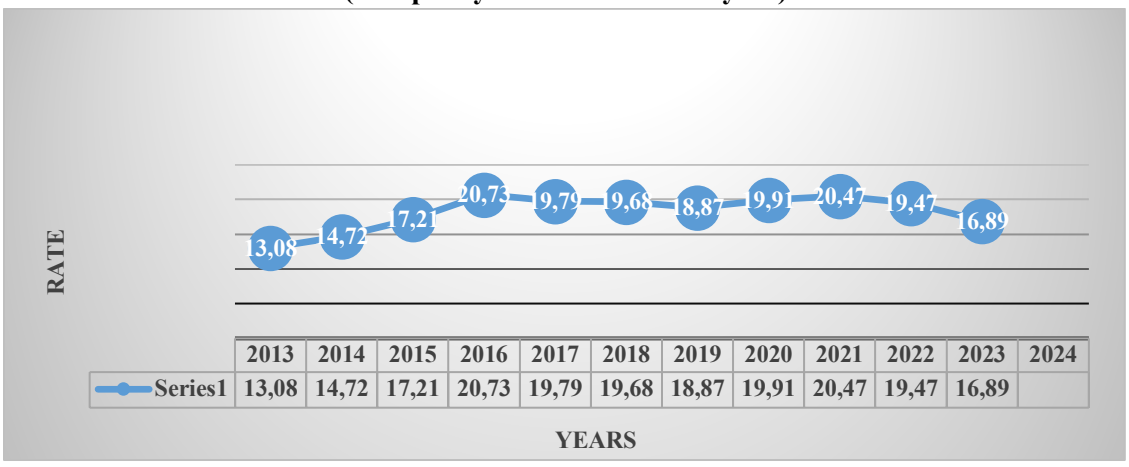
Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	12.71	13.37	14.69	18.45	21.02	18.62	19.04	18.91	20.22	20.74	18.79	17.23
February	12.87	13.30	14.92	18.17	19.83	18.65	19.26	19.78	20.94	20.65	18.40	17.06
March	12.36	13.08	15.15	17.40	18.81	18.33	19.38	23.48	20.44	19.99	18.11	16.68
April	12.16	13.14	15.22	19.40	19.11	18.86	19.01	23.93	20.18	20.57	18.07	17.16
May	12.63	12.87	15.36	18.45	18.51	19.75	19.64	22.18	19.92	19.69	17.56	
June	13.19	13.03	15.57	18.91	17.90	20.06	19.21	23.09	19.91	20.13	17.07	
July	12.73	13.06	16.21	18.86	17.69	18.55	19.99	22.20	19.85	20.34	16.73	
August	13.25	13.08	16.89	18.58	17.88	19.07	20.07	21.89	20.06	20.09	16.84	
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, used for settling 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

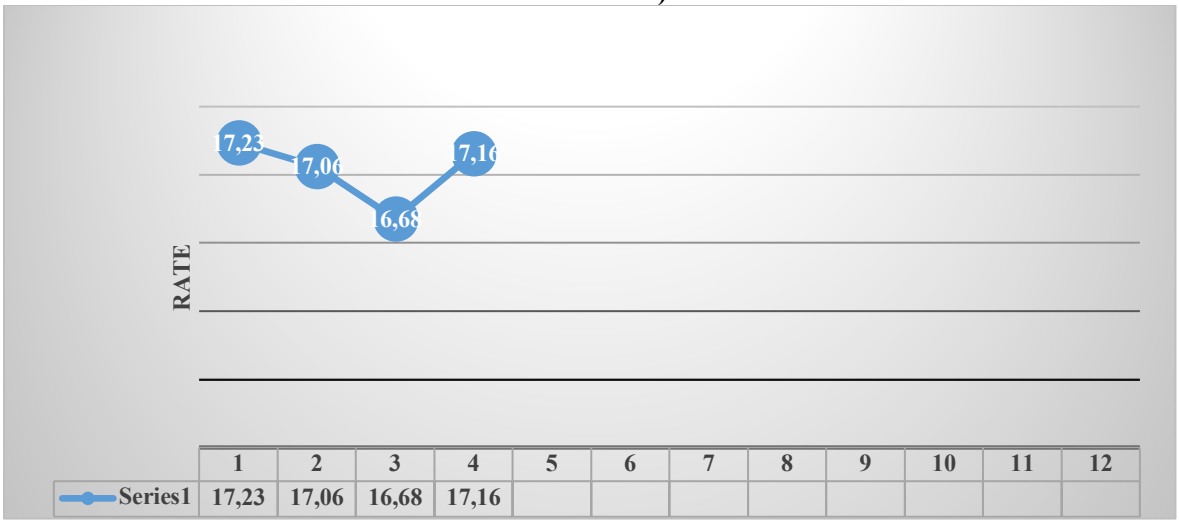
Graph 5

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-April 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)

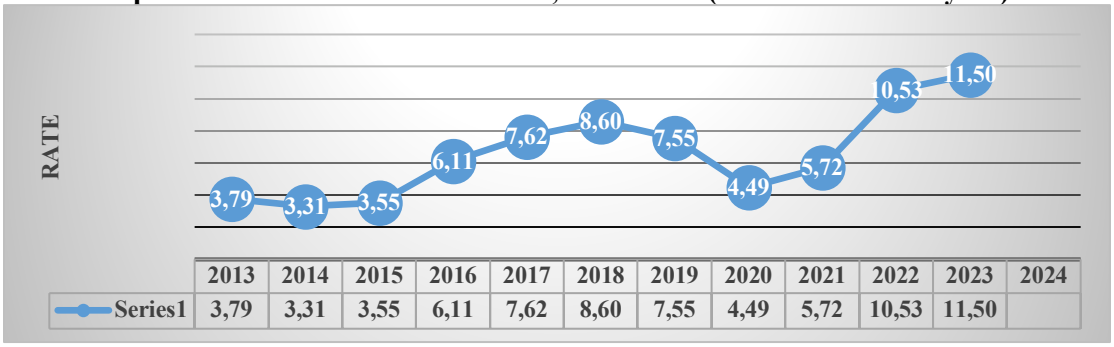
On March 23, 1995, the Bank of Mexico, to establish an interbank interest rate that better reflects market conditions, released the Interbank Equilibrium Interest Rate through the Official Gazette of the Federation.

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	
June	4.31	3.31	3.30	4.11	7.36	8.10	8.49	5.28	4.32	7.42	11.49	
July	4.32	3.31	3.31	4.59	7.38	8.11	8.47	5.19	4.52	8.04	11.51	
August	4.30	3.30	3.33	4.60	7.38	8.10	8.26	4.76	4.65	8.50	11.51	
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	

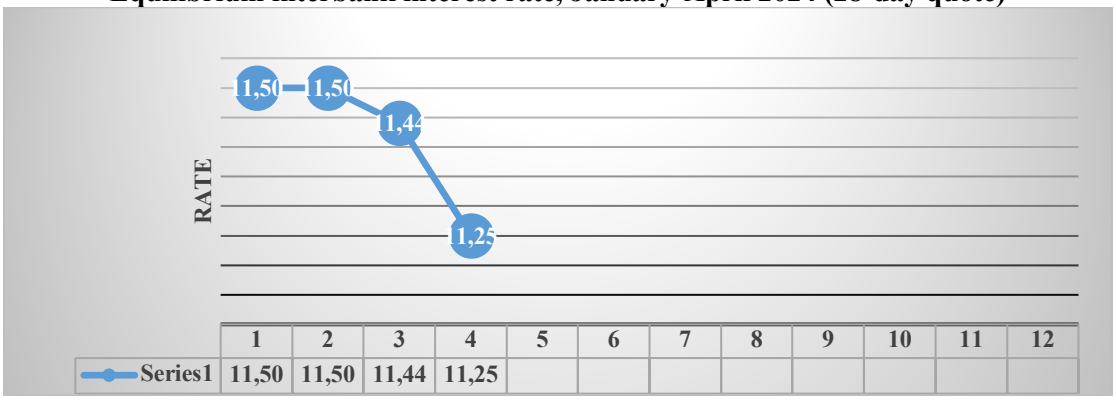
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=18&accion=consultarCuadro&idCuadro=CF101&locale=es

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-April 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

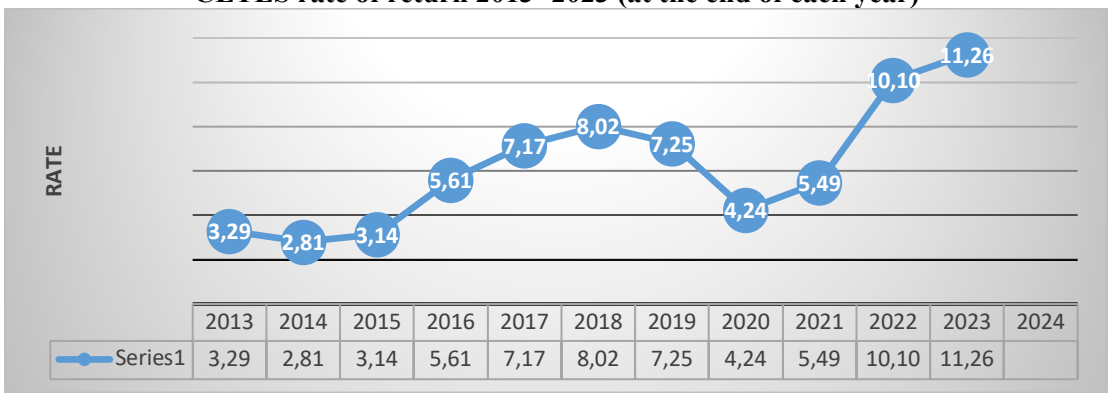
5. CETES RATE OF RETURN

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	
June	3.78	3.02	2.96	3.81	6.82	7.64	8.18	4.85	4.03	7.56	11.02	
July	3.85	2.83	2.99	4.21	6.99	7.73	8.15	4.63	4.35	8.05	11.09	
August	3.84	2.77	3.04	4.24	6.94	7.73	7.87	4.50	4.49	8.35	11.07	
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	

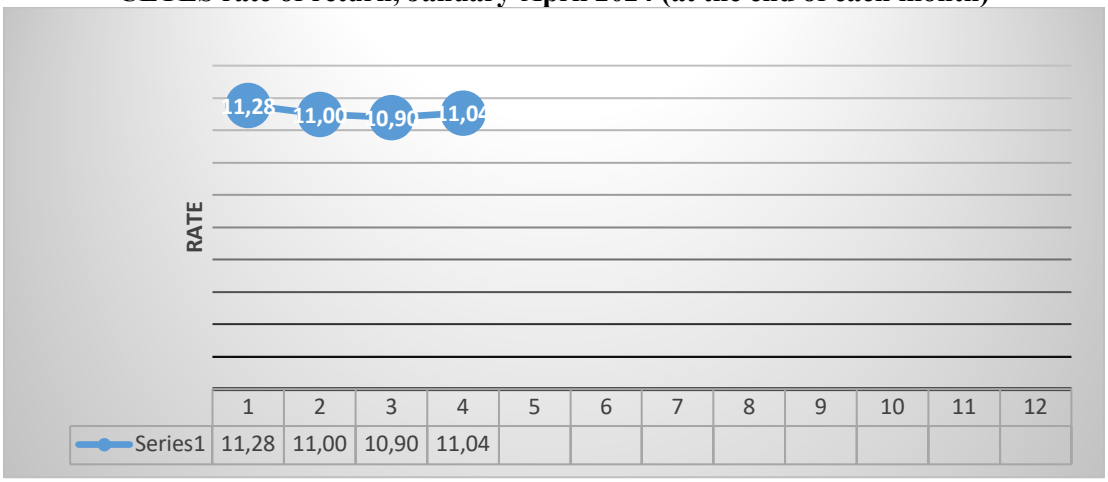
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=22&accion=consultarCuadro&idCuadro=CF107&locale=es

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-April 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)

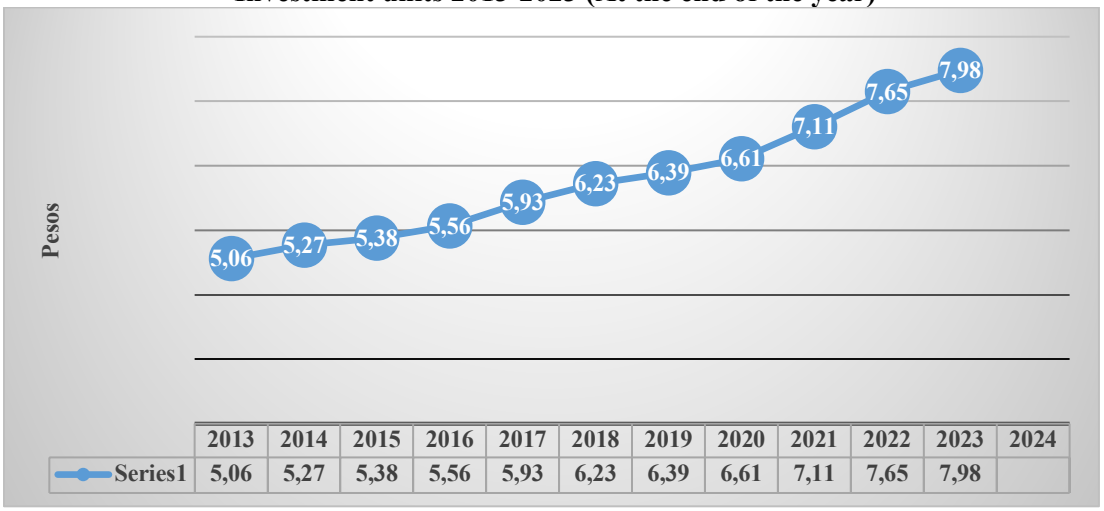
The UDI is a unit of account of constant real value to denominate credit titles. It does not apply to checks, commercial contracts, or other acts of commerce.

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	
June	4.95	5.13	5.28	5.42	5.75	6.01	6.26	6.44	6.83	7.36	7.77	
July	4.95	5.14	5.28	5.42	5.76	6.04	6.27	6.49	6.87	7.43	7.79	
August	4.95	5.16	5.29	5.44	5.79	6.07	6.29	6.52	6.90	7.47	7.83	
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	

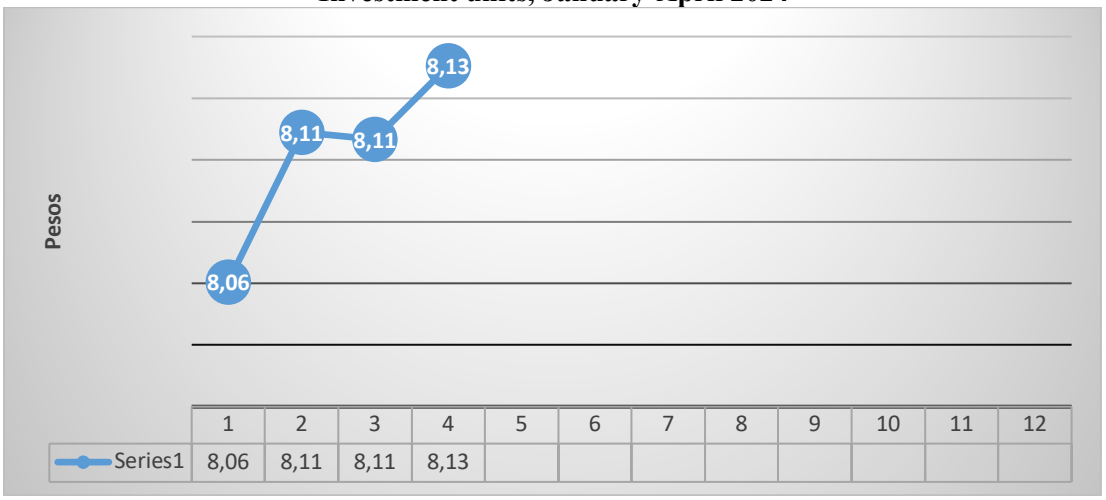
Source: Own elaboration (BANXICO, 2024).
https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CP150&locale=es

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-April 2024



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

The Delphi method has not achieved a standardized consensus on its definitions, nor on the presentation of the final reports. In this method, as in all research methods, the results obtained depend to a large extent on its approach, the adequate review of the literature and the experience of the experts on the panel, which together with the systematization and adequate application of the process, as a whole, allow obtaining a product that facilitates the understanding and interpretation of social phenomena in their reality. relationships, values,

attitudes, beliefs, habits, and representations, which cannot be obtained through traditional research methods.

In the social sciences, particularly in business, the application of the Delphi method makes it possible to analyze and carry out prospections that reflect the viability of the company's growth, as well as the trends of the sector to which it belongs and the evolution of its market, managing to anticipate the needs of its customers, allowing them to make better decisions and establishing measures according to the probable future scenarios.

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