Retos
Revista de Ciencias de Administración y Economía

april-september 2024

Contents

print ISSN: 1390-6291; electronic ISSN: 1390-8618

«Retos» is a bilingual scientific publication of the Salesian Polytechnic University of Ecuador, published since January 2011 without interruption, with a fixed bi-annual periodicity (April 1 and October 1), specialized in Development and its transdisciplinary lines as Public Administration, Social Economy, Marketing, Tourism, Entrepreneurship, Management, Administrative and Economic Sciences, among others. It is a peer-reviewed scientific journal, which uses the system of external evaluation by experts (peer-review), under the methodology of blind pairs (double-blind review), according to the publication norms of the American Psychological Association (APA). The fulfillment of this system allows guaranteeing the authors an objective, impartial and transparent review process, which facilitates the inclusion of the publication in databases, repositories and international reference indexes. The Journal is published in two versions: printed (ISSN: 1390-62911) and electronic (e-ISSN: 1390-8618), in Spanish and English. All articles are available on the journal's website (http: // retos.ups.edu.ec).

Domicile of the publication: Salesian Polytechnic University of Ecuador, post office box 2074, Cuenca-Ecuador. Telephone (+5937) 2050000. Fax: (+5937) 4088958. E-mail: revistaretos@ups.edu.ec

EDITORIAL

Editorial Abya-Yala (Quito-Ecuador)

Avenida 12 de octubre N422 y Wilson, Bloque A, UPS Quito, Ecuador.

Telephones: (593-2) 3962800 ext. 2638

E-mail: editorial@abyayala.org.ec

UNIVERSIDAD POLITÉCNICA SALESIANA DEL ECUADOR

Juan Cárdenas, sdb

Rector

Turuhuayco 3-69 y Calle Vieja
Cuenca, Ecuador.
Telephone: (+593 7) 2 050 000
E-mail: srector@ups.edu.ec

TRADE

Trade with other periodicals is accepte

Go to:
Secretaría Técnica de Comunicación y Cultura
Universidad Politécnica Salesiana
Av. Turuhuayco 3-69 y Calle Vieja
Cuenca, Ecuador.
PBX: (+593 7) 2 050 000 - Ext. 1182
E-mail: rpublicas@ups.edu.ec
www.ups.edu.ec
Cuenca - Ecuador

Retos
Revista de Ciencias de Administración y Economía

Year XIV, Issue 27, april-september 2024
Print ISSN: 1390-6291 / electronic ISSN:1390-8618

The management of RETOS is carried out through the following parameters:

The journal uses the anti-academic plagiarism system Crossref Similarity Check

The articles have an identification code *(Digital Object Identifier)*

The editorial process is managed through the OJS Open Journal Systems *Open Journal System*

It is an open access publication *(Open Access)* with Creative Commons license

The *copyright* and use policies post print, are published in the Auto-Archive Policy Repository *SHERPA/ROMEO.*

The articles of the present edition can be consulted in: http: //magazines.ups.edu.ec/index.php/retos

ABYA YALA | UPS

ECUADOR SALESIANOS DON BOSCO

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.9-20
https://doi.org/10.17163/ret.n27.2024.01

Analysis of the multidimensionality of brand equity for the banking sector: a study on generation Z

Análisis de la multidimensionalidad del brand equity para el sector bancario: un estudio en la generación Z

Campo Elías López-Rodríguez
Professor at Corporación Universitaria Minuto de Dios-UNIMINUTO, Colombia
clopezr3@uniminuto.edu.co
http://orcid.org/0000-0003-4061-2979

Johanna Katherine Sotelo-Muñoz
Specialist in Financial management at Corporación Universitaria Minuto de Dios-UNIMINUTO, Colombia
jsotelomuno@uniminuto.edu.co
https://orcid.org/0009-0006-0605-7499

Ingrid Janeth Muñoz-Venegas
Specialist in Financial management at Corporación Universitaria Minuto de Dios- UNIMINUTO, , Colombia
imunozveneg@uniminuto.edu.co
https://orcid.org/0009-0007-6435-3920

Nicolás Fabián López-Aguas
Specialist in Financial management at Corporación Universitaria Minuto de Dios-UNIMINUTO, Colombia
nicolas.lopez-a@uniminuto.edu.co
https://orcid.org/0009-0005-0831-4279

Received on: 13/12/23 **Revised on**: 15/01/24 **Approved on**: 19/02/24 **Published on**: 01/04/24

Abstract: in the competitive scenario of the banking sector, marketing and branding activities have become a crucial element for the long-term success of financial institutions. From the perspective of brand equity management, trust and loyalty are essential, not only in the operational processes with users, but also in the consolidation of the brand as a strategic asset. The aim of this research was to analyse the multidimensionality of brand equity for the banking sector from the perspective of Generation Z. A quantitative, analytical, and cross-sectional study was carried out, using exploratory and confirmatory factor analysis based on an instrument applied online to people belonging to this generational segment. The findings infer that brand equity in the banking sector aimed at Generation Z is made up of the following dimensions: brand loyalty and importance (BLI), perceived quality (PQ), brand association (BA), brand performance (BP) and brand awareness (BA). It is concluded that the banking sector must continue to consolidate its brand equity as a strategic activity based on these dimensions, strengthening its brand positioning, market share and market orientation, ensuring an understanding of the needs, desires, and behaviours of Generation Z.

Keywords: brand equity, banking industry, marketing strategy, branding, generation Z, factor analysis, management, innovation management.

Suggested citation: López-Rodríguez, C. E., Sotelo-Muñoz, J. K., Muñoz-Venegas, I. J. and López-Aguas, N. F. (2024). Analysis of the multidimensionality of brand equity for the banking sector: a study on generation Z. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 9-20. https://doi.org/10.17163/ret.n27.2024.01

Resumen: en el escenario competitivo del sector bancario, las actividades de marketing y branding se han convertido en un elemento crucial para el éxito a largo plazo de las instituciones financieras. Desde la gestión del brand equity, la confianza y la lealtad son esenciales, no solo en los procesos operativos con los usuarios, sino en la consolidación de la marca como un activo estratégico. El objetivo de esta investigación fue analizar la multidimensionalidad del *brand equity* para el sector bancario desde la perspectiva de la generación Z. Se desarrolla un estudio de tipo cuantitativo, analítico y de corte transversal, utilizando el análisis factorial exploratorio y confirmatorio a partir de un instrumento aplicado de forma on line a personas pertenecientes a este segmento generacional. Los hallazgos infieren que el *brand equity* en el sector bancario dirigido a la generación Z está conformado por las siguientes dimensiones: fidelidad e importancia de la marca (FIM), calidad percibida (CP), asociación de marca (AM), rendimiento de la marca (RM) y conciencia de la marca (CM). Se concluye que el sector bancario debe seguir consolidando su *brand equity* como actividad estratégica a partir de dichas dimensiones, fortaleciendo el posicionamiento de sus marcas, su participación y su orientación al mercado, garantizando el entendimiento de las necesidades, deseos y comportamientos de la generación Z.

Palabras clave: valor de marca, sector bancario, estrategia de marketing, gestión de marca, generación Z, análisis factorial, gerencia, gestión de la innovación.

Introduction

Although demographic changes affect economy, they have a special impact on banking, since it is an activity that participates in the processes of purchase, payment and other financial transactions that involve the other productive sectors (Garg *et al.*, 2021; Imam, 2013). This sector develops products and automation forms that do not always fit the characteristics of consumers; hence, the banking can join this relational dynamic depending on the market, especially with generation Z (Thusi and Maduku, 2020). In the digital and technological era of the 21st century, this generation has emerged as a driving force in the consumer. Originated in the 1990s and mid-2010s, this generation have grown up immersed in technology, constant connectivity and open access to information (Djafarova and Foots, 2022).

Generation Z has transformed the way companies approach the market; hence, offering must have strategic communication processes from mobile devices, since the internet connection is a natural extension of these consumers. This generation demonstrates a very relevant social and environmental awareness in its purchasing decisions (Wawer *et al.*, 2022), making sustainability an obvious practice, not only as a flag in integrated marketing communications, but in the actual operability of organizations.

Yasin *et al.* (2020) highlight how marketing has gradually become a key activity for banking, which characterizes by the wide range of multichannel services, making entities not only develop efforts to attract customers but to retain them, leaving aside their approach to the product to head towards the market. Unlike previous generations, Generation Z values not only products but consumer experiences (Windasari *et al.*, 2022); therefore, brands that offer memorable experiences strengthen the market's perception of their brand value, i.e., their brand equity.

Brand equity consolidates in an organization when the product is memorable, easily recognizable, trustworthy and superior in quality and reliability (Sürücü *et al.*, 2019). According to Forero Siabato and Duque Oliva (2014), brand equity has gained popularity since the early 1980s, because the brand has been considered a main asset for companies, particularly for those market oriented. Brand equity enables companies to build strong brands, supported by marketing and communication strategies, resulting in profits and financial statements strengthening by increasing the value of this intangible asset (Kim *et al.*, 2018). Therefore, Buil *et al.* (2013) highlight the role of consumers in the success of the brand in the market, so they suggest that these should be considered in the development of their measurement to know their perception, preference and behavior; hence, it is necessary to have strategic tools to manage brand equity in organizations.

As for Keller (2002), brand equity is a managerial proposal associated with brand building and is evident at the time when the consumer possesses a high level of awareness and knowledge of it, identifying strong, favorable and unique associations of brands in the memory. It is a great challenge for the banking to have strategic tools that support the strengthening of its brand, because adapting to new technologies and understanding the changing values of the new generations

print ISSN: 1390-6291; electronic ISSN: 1390-8618

are crucial to succeed in the market. Banks that understand the changing dynamics of Generation Z and can align it with the dimensions to manage their brand equity will be able to achieve successful commercial and financial results, based on a lasting and mutually beneficial relationship with that generation in the contemporary competitive scenario.

Based on the above, this research poses the following research question: What are the dimensions of brand equity that must be consolidated in banking to strengthen its relationship with generation Z? It is necessary to develop a conceptual approach focused on brand equity and the benefits of its consolidation for companies that have a high market orientation, to identify the underlying structure of the theoretical variables related to brand equity in the banking sector through an exploratory factor analysis, and finally, to evaluate the adjustment of brand equity dimensions in banking for generation Z through a confirmatory factor analysis.

Literature review

Brand equity measures how consumers perceive and value a brand compared to others in the market. It is not limited only to tangible aspects, such as products or services, but also it incorporates intangible elements such as perception, customer loyalty, emotional association and reputation (Sürücü *et al.*, 2019). For Aaker (1996), high brand value can have several benefits for a company, such as the ability to charge premium prices, increase customer loyalty, greater resilience to competition, and the ability to expand into new markets and product categories.

Brand equity is built over time through the positive experiences that consumers have with the brand, as well as through effective marketing strategies that reinforce the image and positioning of the brand in the public mind (Nikhashemi *et al.*, 2017). Brand equity consists of these dimensions: brand awareness, perceived quality, brand associations, brand loyalty and brand image (Aaker, 1996; Keller, 2002). The conceptual approach is presented below.

According to Keller (2002), brand awareness refers to the level of recognition consumers have about a particular brand. It is a measure of the extent to which consumers are able to identify and remember a brand in the context of a category of products or services. It is the ability of consumers to identify and recognize a brand when it is shown to them, whether through their logo, name, slogan or other visual elements associated with the brand (Sürücü *et al.*, 2019).

Perceived quality can be influenced by a variety of factors, such as past experiences, opinions of other consumers, advertising, online reviews, and more (Nikhashemi *et al.*, 2017). For Snoj *et al.* (2004), perceived quality is subjective and is based on individual consumer perceptions and beliefs. The marketing strategies and actions of the company can influence how the quality of the brand is perceived. To build and maintain high brand value, it is essential that a company supports its perception of quality with products that consistently meet consumer expectations (Uncles and Lee, 2006).

Brand association represents the attributes, values, emotions, characteristics and concepts that consumers and the general public relate to a particular brand (Liu *et al.*, 2017). These partnerships are built over time through the interactions that consumers have with the brand, as well as through the marketing and communication strategies implemented by the company (Sürücü *et al.*, 2019). Brand partnerships are important because they influence how consumers perceive, remember and connect emotionally with a brand.

From the perspective of Mills *et al.* (2022), brand loyalty represents the degree to which consumers have a consistent and repetitive preference for a particular brand compared to other options available on the market. Loyal consumers tend to buy their products or use their services consistently over time, even when other consumer alternatives are presented (Jensen and Hansen, 2006).

When there is a high rivalry between competitors and where customers have a high bargaining power (Porter, 2008) having a solid brand image consolidates a competitive advantage used by organizations to differentiate themselves from other offers, and even more so, when in addition to buying products to meet needs, consumers also consume image (Kim *et al.*, 2018). Therefore,

Keller (2002) states that the brand image represents the perceptions about the brand that are reflected as existing associations in the consumer's memory.

Materials and method

For conducting this research, 535 elderly people living in Bogotá, Colombia, were considered, belonging to generation Z, who for Priporas *et al.* (2017) are those who were born between 1995 and 2010. A non-probabilistic sampling was carried out from the infinite population methodology. The fieldwork was carried out through an *online* questionnaire applied between October and November 2023.

A quantitative study with a descriptive correlational design was carried out, in which a questionnaire was developed to collect the information. The applied questionnaire was divided into two sections: the first was formed by demographic questions that characterize the participants, initially identifying their age as a filter question to ensure that each of them belonged to generation Z. Likewise, they were asked their gender, socioeconomic stratum, education, occupation, and consumption trends of products of the banking. In the second part, an adaptation of the Narteh scale (2018) was developed with the constructs associated with brand equity, extracted from Aaker's proposal (1996) with a five-point-Likert-type scale where 1 was "totally disagree" and 5 "totally agree". For identifying internal consistency, constructs from the Cronbach Alpha were analyzed. The total of the instrument presented a α=0.972 for all theoretical items. The results of internal consistency for each theoretical construct are presented in table 1.

Table 1
Internal consistency of the applied instrument

Theoretical construct	Cronbach Alpha	Cronbach's Alpha	Número de ítems
Brand Awareness (BAS)	0.753	0.782	5
Perceived Quality (PQ)	0.906	0.907	5
Brand Association (BA)	0.910	0.911	5
Brand loyalty (FL)	0.923	0.924	5
Brand Importance (BI)	0.898	0.902	5
Brand Sympathy (BS)	0.904	0.907	5
Brand Performance (BF)	0.914	0.915	5

To support the psychometric level of the instrument and thus achieve the proposed objectives, an exploratory factor analysis was performed, followed by a confirmatory. The Exploratory Factor Analysis (EFA) used the Kaiser Meyer Olkin (KMO) test that allows a factor measurement to properly evaluate the data. Then the Bartlett sphericity test was done to determine if there is a significant correlation structure between the variables studied. The factorial extraction method was the factorization of main axes with a Varimax rotation to obtain the solution of correlated factors and identify structures of observed variables and group them into latent factors (Grieder and Steiner, 2022).

Confirmatory Factor Analysis (CFA) used the Diagonally Weighted Least Squares (DWLS) method due to the ordinal nature of the items present on the measurement scale (Chen *et al.*, 2015). The fit of the model was evaluated with Chi-square test (χ2), the approximation mean square error index (MSEI) and the standardized mean square residue index (MSRI), where values below 0.05 determine a good fit, and between 0.05 and 0.08 an acceptable fit (Li, 2016). The Comparative Adjustment Index (CAI) and the Tucker-Lewis Index (TLI) were also taken into account, whose values above 0.95 indicate a good adjustment (Li, 2016).

The Omega Coefficient (ω) and the Alpha Coefficient (α) were revised to evaluate the internal

print ISSN: 1390-6291; electronic ISSN: 1390-8618

consistency of the scale, which are determined to be adequate since they are greater than 0.80 (Hayes and Coutts, 2020). The mean extracted variance (AVE) was calculated, which is a concept used in the data analysis and validation of measurement models around the underlying value, in order to explain more than 50% of the variance in the established indicators (Rubia, 2019). Finally, the Kaiser Meyer Olkin (KMO) test for each item is presented, observing that values close to 1.0 indicate that a factor analysis can be useful with the data it possesses (Chen *et al.*, 2015).

The analysis of the information was carried out through free software JASP, which characterizes by the implementation of methods such as statistical-frequentist analysis, Bayesian analysis and regression analysis (Huth *et al.*, 2023).

Results

The average age of participant was 23.73 years old with a deviation of 3.6. Likewise, 68.2% of them were girls while 31.8% were men. More than 90% of participants are students or workers, occupations in which the use of digital payment is an important tool for their financial movement.

Exploratory factor analysis

To initiate the EFA, the Bartlett test was analyzed, which is observed as statistically significant ($\chi 2 = 10534.540$, $p < 0.001$) allowing to consider the factorial extraction relevant. The Kaiser Meyer Olkin test is performed, where the adequacy of the total sample is analyzed to support the relevance of this analysis, obtaining an indicator of 0.958, as shown in table 2.

As for the approximation error (MSEI) that explains the amount of unexplained variance, a 0.051 was obtained, determining a good fit for the data. The Tucker-Lewis index (TLI), which compares the degree-of-freedom adjustment of the proposed model to zero reached 0.931 and identified a very good fit for it. Regarding the Comparative Adjustment Index (CFI) that allows to evaluate the goodness of fit of a model to the observed data reached 0.959, determining an excellent fit of the model.

Table 2
Kaiser Meyer Olkin and Barlett test

Kaiser-Meyer-Olkin measure of sampling adequacy		**0.958**
Bartlett sphericity test	Approx. Chi-square	10534.5
	DF	276
	p	<0.001

From the EFA, the factor loads of the model are presented in table 3, where five new factors and 24 items that adequately meet these loads are finally identified, which will allow managing the multidimensionality of brand equity for the banking sector in generation Z. These new dimensions are brand loyalty and importance (BLI), perceived quality (PQ), brand association (BA), brand performance (BP), and brand awareness (BAS).

Table 3
Factor loads

Items	**Brand loyalty and importance (BLI)**	**Perceived Quality (PQ)**	**Brand Association (BA)**	**Brand Performance (BP)**	**Brand Awareness (BAS)**
BL2	0.806				
IM3	0.779				
BL1	0.723				
BL4	0.682				

Ítems	Fidelidad e importancia de la marca (FIM)	Calidad percibida (CP)	Asociación de marca (AM)	Rendimiento de la marca (RM)	Conciencia de marca (CM)
IM4	0.669				
BL3	0.611				
PQ3		0.888			
PQ2		0.871			
PQ4		0.749			
PQ1		0.693			
PQ5		0.534			
BA5			0.897		
BA4			0.854		
BA3			0.824		
BA1			0.579		
BA2			0.517		
BP2				0.844	
BP1				0.783	
BP4				0.669	
BP3				0.593	
BP5				0.483	
BAS2					0.900
BAS1					0.784
BAS3					0.641

Confirmatory factor analysis

Table 4 presents the general report of the goodness of fit of the EFA, which allows to evaluate how well the proposed model fits the observed data, as well as to understand the underlying structure of the data set of brand equity dimensions for the banking in generation Z, finding favorable results in the instrument. In general, the results show that the observed factors of the test confirm the theoretical factorial structure with which the instrument was designed.

Table 4
General Adjustment Report

Indicator	CFA Adjustments
Chi-square test (χ2) Baseline model	10731.791
Chi-square test (χ2) Factor model	1213.475
Comparative Fit Index (CFI)	0.907
Tucker–Lewis Index (TLI)	0.894
Root mean square error of approximation (MSEI)	0.087
MSEI 90 % CI lower bound	0.082
MSEI 90 % CI upper bound	0.092
Standardized root mean square residual (MSRI)	0.059

print ISSN: 1390-6291; electronic ISSN: 1390-8618

The scale used for the analysis presented an overall mean extracted variance (AVE) of 0.664, an Omega Coefficient (ω) of 0.965, and an Alpha Coefficient (α) of 0.961. Table 5 presents these same indicators independently for each of the resulting dimensions of the EFA, and for each of its total scale items, non-standardized factor loads, the Kaiser Meyer Olkin test (KMO) and the standard error, finding satisfactory results for each subscale.

Table 5

Coefficients, extracted average variance and item description for the multidimensionality of the brand equity of the banking sector in generation Z

Dimensions	Omega (ω)	Alpha (α)	BIRD	Items	Factor loads	KMO	p	Std. Error
Brand loyalty and importance (BLI)	0.904	0.909	0.624	FM2	0.923	0.963	< 0.001	0.043
				IM3	0.827	0.959	< 0.001	0.048
				FM1	0.896	0.967	< 0.001	0.041
				FM4	1.007	0.960	< 0.001	0.040
				IM4	0.834	0.964	< 0.001	0.041
				FM3	0.971	0.968	< 0.001	0.041
Perceived Quality (PQ)	0.911	0.06	0.665	CP3	0.839	0.967	< 0.001	0.033
				CP2	0.802	0.963	< 0.001	0.036
				CP4	0.847	0.969	< 0.001	0.036
				PA1	0.711	0.969	< 0.001	0.033
				CP5	0.785	0.964	< 0.001	0.039
Brand Association (BA)	0.914	0.910	0.673	AM5	0.800	0.947	< 0.001	0.035
				AM4	0.773	0.944	< 0.001	0.039
				AM3	0.856	0.955	< 0.001	0.034
				AM1	0.830	0,963	< 0.001	0.036
				AM2	0.847	0.971	< 0.001	0.038
Brand Performance (BP)	0.916	0.914	0.683	RM2	0.823	0.936	< 0.001	0.035
				RM1	0.825	0.952	< 0.001	0.037
				RM4	0.811	0.959	< 0.001	0.037
				RM3	0.877	0.972	< 0.001	0.037
				RM5	0.885	0.961	< 0.001	0.039
Brand awareness (BAS)	0.856	0.847	0.656	CM2	0.702	0.876	< 0.001	0.031
				CM1	0.738	0.905	< 0.001	0.033
				CM3	0.752	0.962	< 0.001	0.039

Table 6 presents the factor covariances for the relationship between the dimensions of brand equity found, with satisfactory results between the estimates, the standard error, the z-value and the level of significance (p) of each relationship.

Table 6

Factor covariances

Relationships	Estimate	Std. Error	z-value	p
BLI ⇔ PQ	0.834	0.018	47,410	< 0.001
BLI ⇔ BA	0,750	0,023	32,179	< 0.001
BLI ⇔ BP	0.812	0.019	42,123	< 0.001
BLI ⇔ BAS	0.426	0.042	10,163	< 0.001
PQ ⇔ BA	0,806	0.020	40,489	< 0.001
BP ⇔ BP	0,781	0.021	36,575	< 0.001

Relationships	Estimate	Std. Error	z-value	p
PQ ⇔ BAS	0.538	0.037	14,421	< 0.001
BA ⇔ BP	0,740	0,024	30,999	< 0.001
BA ⇔ BAS	0,652	0.031	20,751	< 0.001
BP ⇔ BAS	0.450	0.041	11,080	< 0.001

Table 7 proposes the multidimensional structure for measuring brand equity in the banking sector from the perception of generation Z.

Table 7

Multidimensional structure of brand equity in the banking sector from the perception of generation Z

Dimension	Items
Brand loyalty and importance (BLI)	I consider myself an advocate of my bank
	My bank is the only alternative for all my banking activities
	I am loyal to my bank
	I am satisfied with the benefits I make in my bank
	My bank can give me a long-term return when market conditions change
	I will keep saving with my bank
Perceived Quality (PQ)	I think my bank products have a good quality
	The cost of my bank's products is commensurate with the quality of these
	The quality of my bank's interpersonal service fits my need
	My bank's products have better quality than those of other banks
	The digital development offered by my bank is of good quality
Brand Association (BA)	My bank has good brand positioning
	Easy access of my bank on digital platforms
	My bank has a good reputation in society
	My bank has a positive image in the country
	I have fond memories linked to my bank
Brand Performance (BP)	I think my bank has increased the number of customers compared to others in the country
	I consider my bank's growth to be higher than others in the country
	My bank has extensive digital and in-person media coverage
	I think my bank is interested in projects that benefit society
	My bank cares about knowing the level of customer satisfaction
Brand Awareness (BAS)	I identify my bank logo
	I easily recognize my bank among others
	If someone asks me about a bank, mine comes easily to mind

Conclusions and discussion

Aaker (1996) describes that brand equity is supported by brand awareness, perceived quality, partnerships and brand loyalty, dimensions that since the Narteh proposal (2018) were complemented with the importance, sympathy and performance of the brand; however, according to the results obtained in the study focused on the banking sector from the perception of generation Z, a multidimensional structure of brand equity is proposed with the following constructs: brand loyalty and importance (BLI), perceived quality (PQ), brand association (BA), brand performance (BP) and brand awareness (BAS).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

The dimension called "brand loyalty and importance" relates with the perception that the consumer has of the services offered by the banking sector in terms of loyalty and defense towards the brand (Althuwaini, 2022), since this dimension relates to the responsiveness that banks have about the particular needs of generation Z, and that this is the only and most important alternative when choosing a bank, since their specific needs will be met.

Regarding the dimension of "perceived quality", it can be determined that by comparing different brands, the consumer will be able to obtain better expectations regarding the real efficiency of the services offered and visualize the benefits, all focused on the image in the market increase, generating a greater positioning of the brand (Zhao *et al.*, 2022). The "brand association" dimension determines the degree to which consumers belonging to generation Z are aware of the existence of the brand and easily recognize the services offered by it (Lim and Guzmán, 2022). Therefore, branding plays a very important role that supports the loyalty of each client and the association that it makes with the brand, allowing banking entities an increase in prices that does not decrease their participation in the market, making their brand image recognized, respected and reliable in the face of the continuous innovation of their competitors (López-Rodríguez *et al.*, 2022).

"Brand performance" is recognized as the way to measure in a future whether the brand is being successfully accepted among the population studied to anticipate its performance in the market (Oliveira *et al.*, 2022). Some of the measures used to analyze this dimension allow to evaluate the current performance of the brand to identify problems and determine its potential. The "brand awareness" represents the capacity of remembering and recognizing from the communication strategies. When brand awareness becomes stronger and increases continuously, it generates a high probability that users will choose their main consumption option, increasing loyalty levels (Supiyandi *et al.*, 2022).

This research provides a detailed insight to address brand equity management in the banking sector for Generation Z. While strengths in emotional connection and positive brand perception have been identified, the recommendations offer ways to further strengthen the validity and applicability of the results. Generation Z has specific characteristics in their role as consumers, which are associated with digitalization, empowerment, social awareness, personalization, and the valuation of consumer experiences (Lee *et al.*, 2023: Puiu *et al.*, 2022; Thangavel *et al.*, 2022), characteristics that have led companies to dynamize their marketing and branding strategies, as well as the way they approach Generation Z as consumers, where adaptability and the ability to connect authentically with these consumers are essential to success in this market.

This new multidimensional proposal of brand equity for banking brands in the generation Z will allow these entities to strengthen their market orientation, making the shopping experiences for these consumers significant by developing effective and particular microsegmentation processes, developing appropriate activities related to integrated marketing communications with the management of marketing strategies, with actions aimed at improving the service, as well as the specialization of the sales force, which by recognizing the characteristics of these digital natives, will not only be able to fully meet their needs as a consumer, but will make an important contribution to corporate branding from the strengthening of the brand equity of the companies that constitute the banking sector.

Among the most relevant limitations of this research, the resistance of the population to participate in the study stands out, despite the fact that the survey was applied *online,* which is a daily scenario of generation Z; and although this generation tends to perform multiple tasks at once, since they are constantly exposed to information through different channels, influencing how they consume content and make purchasing decisions, a significant sample was obtained that supported the methodological strategy.

Future lines of research are proposed, such as the processes of analysis of the consumer experience that belongs to generation Z in banking from the digitalization and use of technology; the valuation of diversity in integrated marketing

communications; the authenticity of the value proposals of banking entities, as well as their social and environmental commitment (Reyes-Ramírez *et al.*, 2022).

For future studies, it is important to verify whether this new multidimensional proposal of brand equity in banking has effects on the consumption intention of products offered by these entities to consumers belonging to generation Z, from structural equation models, which allow to test hypotheses for setting empirical studies.

References

Aaker, D.A. (1996). *Building Strong Brands*. The Free Press.

Althuwaini, S. (2022). The effect of social media activities on brand loyalty for banks: The role of brand trust. *Administrative Sciences*, *12*(4), 148. https://doi.org/10.3390/admsci12040148

Buil, I., Martínez, E. and De Chernatony, L. (2013). The influence of brand equity on consumer responses. *Journal of consumer marketing*, *30*(1), 62-74. https://doi.org/10.1108/07363761311290849

Chen, P. Y., Yang, C. M. and Morin, C. M. (2015). Validating the cross-cultural factor structure and invariance property of the Insomnia Severity Index: evidence based on ordinal EFA and CFA. *Sleep medicine*, *16*(5), 598-603. https://doi.org/10.1016/j.sleep.2014.11.016

Djafarova, E. and Foots, S. (2022). Exploring ethical consumption of generation Z: Theory of planned behaviour. *Young Consumers*, *23*(3), 413-431. https://doi.org/10.1108/YC-10-2021-1405

Forero Siabato, M. F. and Duque Oliva, E. J. (2014). Evolución y caracterización de los modelos de Brand Equity. *Suma de negocios*, *5*(12), 158-168. http://dx.doi.org/10.1016/j.neucir.2013.12.001

Garg, P., Gupta, B., Chauhan, A. K., Sivarajah, U., Gupta, S. and Modgil, S. (2021). Measuring the perceived benefits of implementing blockchain technology in the banking sector. *Technological forecasting and social change*, *163*, 120407. https://doi.org/10.1016/j.techfore.2020.120407

Grieder, S. and Steiner, M. D. (2022). Algorithmic jingle jungle: A comparison of implementations of principal axis factoring and promax rotation in R and SPSS. *Behavior research methods*, *54*(1), 54-74. https://doi.org/10.3758/s13428-021-01581-x

Hayes, A. F., y Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But… *Communication Methods and Measures*, *14*(1), 1-24. https://doi.org/10.1080/19312458.2020.1718629

Huth, K. B., de Ron, J., Goudriaan, A. E., Luigjes, J., Mohammadi, R., van Holst, R. J., Wagenmakers, E.-J. and Marsman, M. (2023). Bayesian analysis of cross-sectional networks: A tutorial in R and JASP. *Advances in Methods and Practices in Psychological Science*, *6*(4), 251-264. https://doi.org/10.31234/osf.io/ub5tc

Imam, P. (2013). Demographic shift and the financial sector stability: the case of Japan. *Journal of Population Ageing*, *6*, 269-303. https://doi.org/10.1007/s12062-013-9089-9

Jensen, J. M. and Hansen, T. (2006). An empirical examination of brand loyalty. *Journal of Product & Brand Management*. 15(7), 442-449. https://doi.org/10.1108/10610420610712829

Kim, S. S., Choe, J. Y. and Petrick, J. F. (2018). The effect of celebrity on brand awareness, perceived quality, brand image, brand loyalty, and destination attachment to a literary festival. *Journal of Destination Marketing & Management*, *9*, 320-329. https://doi.org/10.1016/j.jdmm.2018.03.006

Keller, K. L. (2002). Branding and brand equity. En B. Weitz and R. Wensley (eds.), *Handbook of Marketing. London,* 151-178. Sage Publications. http://dx.doi.org/10.4135/9781848608283.n8

Lee, Y. Y., Gan, C. L. and Liew, T. W. (2023). Do E-wallets trigger impulse purchases? An analysis of Malaysian Gen-Y and Gen-Z consumers. *Journal of Marketing Analytics*, *11*(2), 244-261. https://doi.org/10.1057/s41270-022-00164-9

Li, C. H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior research methods*, *48*, 936-949. https://doi.org/10.3758/s13428-015-0619-7

Lim, W. M. and Guzmán, F. (2022). How does promotion mix affect brand equity? Insights from a mixed-methods study of low involvement products. *Journal of Business Research*, *141*, 175-190. https://doi.org/10.1016/j.jbusres.2021.12.028

Liu, M. T., Wong, I. A., Tseng, T. H., Chang, A. W. and Phau, I. (2017). Applying consumer-based brand equity in luxury hotel branding. *Journal of Business Research*, *81*, 192-202. https://doi.org/10.1016/j.jbusres.2017.06.014

López-Rodríguez, C. E., Mora-Forero, J. A. and León-Gómez, A. (2022). Strategic development associated with branding in the tourism sector: bibliometric analysis and systematic review of the literature between the years 2000 to 2022. *Sustainability*, *14*(16), 9869. https://doi.org/10.3390/su14169869

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Mills, M., Oghazi, P., Hultman, M. and Theotokis, A. (2022). The impact of brand communities on public and private brand loyalty: A field study in professional sports. *Journal of Business Research*, *144*, 1077-1086. https://doi.org/10.1016/j.jbusres.2022.02.056

Narteh, B. (2018). Brand equity and financial performance: The moderating role of brand likeability. *Marketing Intelligence & Planning*, *36*(3), 381-395. https://doi.org/10.1108/MIP-05-2017-0098

Nikhashemi, S. R., Valaei, N. and Tarofder, A. K. (2017). Does brand personality and perceived product quality play a major role in mobile phone consumers' switching behaviour? *Global Business Review*, *18*(3), S108-S127. https://doi.org/10.1177/0972150917693155

Oliveira, M. O., Sonza, I. B. and da Silva, T. S. (2023). Brand equity and company performance: evidence from a quasi-experiment in an emerging market. *Marketing Intelligence & Planning*, *41*(4), 393-408. https://doi.org/10.1108/MIP-12-2021-0452

Porter, M. (2008). Las cinco fuerzas competitivas que le dan forma a la estrategia. *Harvard Business Review*, *86*(1), 58-77. https://bit.ly/42HTCCF

Priporas, C. V., Stylos, N. and Fotiadis, A. K. (2017). Generation Z consumers' expectations of interactions in smart retailing: A future agenda. *Computers in human behavior*, *77*, 374-381. https://doi.org/10.1016/j.chb.2017.01.058

Puiu, S., Demyen, S., Tănase, A. C., Vărzaru, A. A. and Bocean, C. G. (2022). Assessing the Adoption of Mobile Technology for Commerce by Generation Z. *Electronics*, *11*(6), 866. https://doi.org/10.3390/electronics11060866

Reyes-Ramírez, L. A., Leyva-del Toro, C., Pérez-Campdesuñer, R. and Sánchez-Rodríguez, A. (2022). Variables de la responsabilidad social corporativa. Un modelo de ecuaciones estructurales. *Retos. Revista de Ciencias de la Administración y Economía*, *12*(24), 286-305. https://doi.org/10.17163/ret.n24.2022.06

Rubia, J. M. (2019). Revisión de los criterios para validez convergente estimada a través de la Varianza Media Extraída. *Psychologia. Avances de la disciplina*, *13*(2), 25-41. https://doi.org/10.21500/19002386.4119

Snoj, B., Korda, A. P. and Mumel, D. (2004). The relationships among perceived quality, perceived risk and perceived product value. *Journal of Product & Brand Management*, *13*(3), 156-167. https://doi.org/10.1108/10610420410538050

Supiyandi, A., Hastjarjo, S. and Slamet, Y. (2022). Influence of brand awareness, brand association, perceived quality, and brand loyalty of shopee on consumers' purchasing decisions. *CommIT (Communication and Information Technology) Journal*, *16*(1), 9-18. https://doi.org/10.21512/commit.v16i1.7583

Sürücü, Ö., Öztürk, Y., Okumus, F. and Bilgihan, A. (2019). Brand awareness, image, physical quality and employee behavior as building blocks of customer-based brand equity: Consequences in the hotel context. *Journal of Hospitality and Tourism Management*, *40*, 114-124. https://doi.org/10.1016/j.jhtm.2019.07.002

Thangavel, P., Pathak, P. and Chandra, B. (2022). Consumer decision-making style of gen Z: A generational cohort analysis. *Global Business Review*, *23*(3), 710-728. https://doi.org/10.1177/0972150919880128

Thusi, P. and Maduku, D. K. (2020). South African millennials' acceptance and use of retail mobile banking apps: An integrated perspective. *Computers in Human Behavior*, *111*, 106405. https://doi.org/10.1016/j.chb.2020.106405

Uncles, M. and Lee, D. (2006). Brand purchasing by older consumers: An investigation using the Juster scale and the Dirichlet model. *Marketing letters*, *17*(1), 17-29. https://doi.org/10.1007/s11002-006-3756-z

Wawer, M., Grzesiuk, K. and Jegorow, D. (2022). Smart mobility in a Smart City in the context of Generation Z sustainability, use of ICT, and participation. *Energies*, *15*(13), 4651. https://doi.org/10.3390/en15134651

Windasari, N. A., Kusumawati, N., Larasati, N. and Amelia, R. P. (2022). Digital-only banking experience: Insights from gen Y and gen Z. *Journal of Innovation & Knowledge*, *7*(2), 100170. https://doi.org/10.1016/j.jik.2022.100170

Yasin, M., Liébana-Cabanillas, F., Porcu, L. and Kayed, R. N. (2020). The role of customer online brand experience in customers' intention to forward online company-generated content: The case of the Islamic online banking sector in Palestine. *Journal of Retailing and Consumer Services*, *52*, 101902. https://doi.org/10.1016/j.jretconser.2019.101902

Zhao, J., Butt, R. S., Murad, M., Mirza, F. and Saleh Al-Faryan, M. A. (2022). Untying the influence of advertisements on consumers buying behavior and brand loyalty through brand awareness: the moderating role of perceived quality. *Frontiers in Psychology*, *12*, 803348. https://doi.org/10.3389/fpsyg.2021.803348

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.21-33
https://doi.org/10.17163/ret.n27.2024.02

Prediction of online purchase behavior: an application of the S-O-R Model

Predicción del comportamiento de compra online: una aplicación del modelo S-O-R

Eugenia Csoban-Mirka
Professor at Instituto de Estudios Superiores de Administración y de la Universidad Católica Andrés Bello, Caracas-Venezuela
eugenia.csoban@iesa.edu.ve
https://orcid.org/0000-0001-9520-197x

Sofía Esqueda-Henríquez
Professor at Instituto de Estudios Superiores de Administración, Caracas-Venezuela
sofia.esqueda@iesa.edu.ve
https://orcid.org/0009-0007-5198-9022

Alfredo Ríos
Professor at Instituto de Estudios Superiores de Administración, Caracas-Venezuela
alfredo.rios@iesa.edu.ve
https://orcid.org/0000-0002-1658-6179

Received on: 31/12/23 **Revised o**n: 24/01/24 **Approved** on: 26/02/24 **Published** on: 01/04/24

Abstract: the objective of this study was to evaluate the effect of the online store atmosphere, shopping values, attitude toward online shopping and emotions on the repurchase intention in an online store, based on the Stimulus-Organism-Response model (S-O-R). Although these elements have been studied in the context of brick-and-mortar stores, recent articles that analyze the influence of these elements in the online environment demonstrate the relevance of this study in current marketing research. The results of an online survey conducted with 306 users of an online pharmaceutical store, which included residents of Venezuela and of other Latin American countries, were analyzed using structural equations, evaluating both the measurement model and the relationship model. The findings allow us to conclude that the use of the S-O-R model is appropriate in predicting online purchase behavior, having achieved an adequate fit, and confirm that the hedonic purchase value has a significant direct impact on both the attitude toward online shopping and the emotional purchase. On the other hand, the utilitarian purchase value negatively affects the emotional purchase and the computer factor favors the attitude toward online purchase. Finally, the attitude toward online shopping and the emotional purchase predicts the repurchase intention. Implications for marketers are discussed.

Keywords: online store atmosphere, hedonic, utilitarian, attitude, emotional, repurchase, SOR, SEM.

Resumen: el objetivo de este estudio es evaluar el efecto de la atmósfera, definida como el diseño consciente del ambiente de la tienda para crear ciertas respuestas en los compradores, en los valores de compra, la actitud hacia la compra y las emociones sobre la intención de recompra en una tienda online, basado en el modelo Estímulo-Organismo-Respuesta (S-O-R, por sus siglas en inglés). Aunque estos elementos han sido estudiados ampliamente en el contexto de tiendas físicas, artículos recientes que analizan la influencia de estos elementos en el ambiente online muestran la relevancia de estudios como este en investigaciones académicas actuales de mercadeo. Los resultados de una encuesta realizada a 306 usuarios de una tienda farmacéutica online, residentes de Venezuela y otros países de América Latina, se analizaron usando ecuaciones estructurales. Los hallazgos permiten concluir que el uso del modelo S-O-R es apropiado en la predicción del comportamiento de compra online, y confirman que el valor de compra hedónico tiene un impacto directo significativo tanto en la actitud hacia las compras como en la compra emocional. Por otra parte, el valor de compra utilitario afecta negativamente la compra emocional y el factor informático favorece la actitud hacia las compras. Por último, la actitud hacia las compras y la compra emocional predicen la intención de recompra. Se discuten las implicaciones para los especialistas en marketing.

Palabras clave: atmósfera de tienda online, hedónico, utilitario, actitud, emoción, recompra, SOR, MEE. Atmósfera de tienda online, hedónico, utilitario, actitud, emoción, recompra, SOR, MEE.

Suggested citation: Csoban-Mirka, E., Esqueda-Henríquez, S. and Ríos, A. (2024). Prediction of online purchase behavior: an application of the S-O-R Model. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 21-33. https://doi.org/10.17163/ret.n27.2024.02

Introduction

The internet has catapulted commerce into an electronic age by changing the way in which consumers search, evaluate, buy and dispose of products and services. The number of online buyers has been growing in recent years and it is estimated that from 2022 to 2023, an additional 0.08 billion online shoppers were added, which means a 3.1% year-over-year growth.

E-commerce has grown uninterruptedly since the emergence of platforms such as Amazon or eBay in the mid-1990s and has been almost exponential in recent years, causing retail stores to pay special attention to the online medium. Given the proven and significant impact of "atmosphere signals" in traditional stores on shopper activity, questions were raised regarding the effect of these atmosphere signals, if any, in the context of online shopping and whether the principles they apply to traditional retail also apply to the online shopping experience.

The atmosphere is a critical aspect and includes the physical elements or characteristics of the interior of a store such as lighting, aroma, music and the arrangement of the merchandise (Baker *et al*., 1994). Numerous researchers in recent decades have raised questions regarding which environmental variables affect consumers' emotional states, how subsequent shopping behavior is affected, how a company should design the multisensory in-store experience to promote purchase and ensure purchase, return on the investment (Donovan *et al*., 1994; Spence, 2022) and recently these same concerns have been raised in the context of online stores (De Aguiar *et al*., 2019; Anwar *et al*., 2020).

In 1973, Kotler declared that one of the most influential elements when buying a product is the atmosphere of the place where this product is found or displayed and urged to understand and use all the power of the atmosphere of the store as a tool of marketing. Originally, he defined the atmosphere as "the conscious design of the store environment to create certain responses in buyers (...) specifically it is the effort to produce emotional effects that increase the probability of the customer's purchase" (p.50).

To decipher these influences and to understand consumer behavior, theories are proposed and models are developed that are tested with both traditional research tools and, more recently, with the emergence of neuromarketing, which provides techniques to measure brain and emotional responses of consumers when faced with stimuli (Shukla, 2019). Theories in marketing are essential to identify the determinants of consumer behavior and develop hypotheses about how these determinants interact. The present study is based on the S-O-R model of cognitive psychology (Eroglú *et al.*, 2001) and aims to evaluate the effect of some stimuli in the online store atmosphere together with internal variables of consumers on the intention to purchase.

S-O-R model: Stimulus-Organism-Response

The environment or physical atmosphere has been understood as the set of variables present in the store, such as music, light, color, smell and design of the space, capable of promoting a purchase response in the consumer. The interest in deciphering the impact of these factors has led to proposing models that help to predict buying behavior. In brick-and-mortar stores, Donovan and Rossiter, in 1982, adapted the model of environmental psychology of Mehrabian and Russel (1974) with the intention of clarifying the impact of factors of the stimulus or environment of the store together with some characteristics of people on the buy or no buy response. The model known by its acronym as S-O-R, proposes that the characteristics of the environment (Stimulus) promote certain emotional states and cognitive reactions (Organism), which determine behaviors of approaching or leaving the store (Response).

More explicitly, the stimulus (S) refers to that which affects the internal states and decision process of the individual, encouraging him to act; the organism (O) is understood as the set of states and internal affective and cognitive processes that intermediate between the stimulus and the responses of the individual. Affective or emotional states were originally characterized, following Mehrabian and Russell (1974) in

print ISSN: 1390-6291; electronic ISSN: 1390-8618

three dimensions, identified by the acronym PAD: Pleasure - Displeasure; Activation - Avoidance and Dominance - Submission. Cognitive states are associated with everything that takes place in the mind during the acquisition, processing, retention and retrieval of information, namely: knowledge, memory, understanding, beliefs and attitudes. Response (R) is called the final action or reaction of the consumer, including psychological reactions such as attitudes and behaviors, depending on their approach, such as the physical approach, exploration, permanence or affiliation, or avoidance, such as physical distancing or abandonment.

The success of the S-O-R model in research in the commercial or retail sector is because it allows us to know how different stimuli affect consumers. To increase customer engagement behaviors, marketers find it essential to understand which factors in the environment produce both emotional and cognitive responses in their target consumers.

The shift towards shopping in virtual stores entails a redefinition of the atmosphere. Dailey (2004) paraphrasing Kotler (1973) defines the web atmosphere as the conscious design of the store's web environment to create certain responses in the buyers (such as positive affect and positive cognitions, etc.) to increase the favorable response of consumers (for example, revisit the site, explore, etc.) and increase the probability of purchase. Thus, it is said that when online marketers design virtual interfaces (web) with the aim of attracting consumers, they are using the web atmosphere as a marketing tool.

Eroglu *et al.* (2001) were the first to propose a systematic approach to the study of online retail. They adapted the S-O-R model by Donovan and Rossiter (1982) to describe and explain how atmospheric signals in the context of an online store (S) influence cognition, emotion (O) and response or shopping behavior (R). One of the most important contributions of these researchers has been the proposal of a taxonomy to classify the atmospheric qualities of online retail. They propose a distinction between environments that have keys with high and low relevance to the task. The environment with relevant keys includes descriptors of the website, verbal or pictographic, that appear on the screen and that facilitate and make the purchase possible by the consumer. An example of these signals would be the verbal content that facilitates the purchase of the product (characteristics of the merchandise, price, return policy), the icons or images and the website map. On the other hand, signals of low relevance to the task do not directly affect their completion, although they can create an atmosphere that makes the shopping experience more pleasant, triggers memories of the purchase in the store (traditional format) or provides confidence for purchase from an unfamiliar retailer, creating a website mood or image. These signs include colors, borders, background pattern, and typeface, among others.

The virtual atmosphere represents an additional design challenge as it includes technological elements typical of information systems and human aspects. Based on the classification of Eroglu *et al*. (2001) and to delimit the characteristics of the atmosphere of online stores, several taxonomies have been proposed (Manganari *et al*., 2009; Gatautis and Vaiciukynaite, 2013) that combine quality technological functionalities of the system or interface design such as hyperlink organization, personalized functions, access speed and self-correction of server errors with elements that contribute to user satisfaction categorized as enjoyment, cognitive results, user empowerment, credibility, organization and visual appearance of the information (Zhang and Von Dran, 2000) as well as interaction factors between the user and the technology: perceived ease and perceived usefulness, considered determinants of the acceptance of the information technology (classical technology acceptance model). For Richard (2005) the computing factors that determine the functionality of the virtual store correspond to highly relevant keys for the task; while the characteristics of the web that promote enjoyment, human factors, are considered keys of low relevance for the task (Eroglu *et al*., 2001).

Hausman and Siekpe (2009) evaluated the effect of the characteristics of the web interface, human and computer factors, on the intention to buy online and report that both factors are

antecedents of online purchase, specifically, they point out that elements such as use of graphics, 3D models, inclusion of humor, etc., attract, retain and motivate consumers to buy on websites and, likewise, computing factors such as organization, clear menus, security and privacy, among others, make consumers understand website design and browse for products and buy what is on offer. More recent results confirm that web design is a key factor for consumer purchasing response (Anaya-Sánchez *et al*., 2020).

On the other hand, Peng and Kim (2014) incorporated the hedonic and utilitarian purchase value as antecedent motivations (part of Stimulus in the S-O-R model) that affect consumer cognition and emotion. Research on buying behavior has identified hedonic and utilitarian motivations as the main types of motivations that move people. Hedonic and utilitarian always allude, in related literature, to how consumers are oriented towards the task: in a functional and instrumental way when talking about the utilitarian; and in an experiential, symbolic and aesthetic affective way that evokes fun, pleasure and excitement, when speaking of the hedonic (Picot-Coupey *et al*., 2021).

Peng and Kim (2014) evaluated the hedonic and utilitarian purchase value on the attitude towards the online purchase and the emotional purchase, the latter considered mediators of the repurchase intention response. The hedonic purchase value, for the authors, reflects the entertainment potential and emotional value of purchases, and is indicated by increased excitement, participation, perceived freedom, escapism, fantasy, and emotional aspects of the shopping experience; while the utilitarian purchase value occurs when the purchase satisfies particular consumer needs, reflecting a goal-oriented, cognitive and non-emotional result, consistent with the characterization of Babin *et al.* (1994). Peng and Kim (2014) showed that hedonic and utilitarian values, which they call the internal influences of the stimulus, are antecedents of the attitude towards online shopping and emotional purchases as well as the online store environment; in turn, the attitude towards online shopping is an effective mediator of purchase intention. Finally, they found that utilitarian purchase value had no impact on emotional purchase, and, also, emotional purchase did not predict purchase intention. In this way, the modified S-O-R model contrasted by these authors achieved partial empirical support in the data.

Moon *et al*. (2017) evaluated the effect of hedonic and utilitarian motivation on attitude towards online shopping and also the effect of attitude on intention. Their findings indicate that utilitarian aspects exert a greater effect on and from attitude on purchase intention compared to hedonic motivation. The accumulated evidence on the effect of hedonic and utilitarian motivation is not always consistent, however, the hedonic and utilitarian value are repeatedly included as antecedents in the investigations together with atmospheric elements to evaluate their impact on different mediating variables, such as attitude and emotion. Sütütemiz and Saygılı (2020) showed that hedonic and utilitarian purchasing motives are validly applied to the online shopping context and have a significant effect on purchase intention.

In the framework of the S-O-R model, cognitive and affective states as mediators have been conceptualized in different ways (Eroglú *et al*., 2001). The attitude towards online shopping has turned out to be a way of operationalizing how the consumer interprets the information coming from the online store environment and then affects the purchase intention (Peng and King, 2014). In general, attitude corresponds to the tendency of people to value an object, event, product or service in a favorable or unfavorable way. It is assumed that the attitude towards the different available consumption options (a product, store or service) determines the consumer's decision: in a situation of choice, the alternative towards which there is a general favorable attitude is selected (Ajzen, 2008; Hebbar *et al*., 2020).

Regarding affective states, other measures are currently included such as emotional regulation, affect, satisfaction, enjoyment, delight, etc., in addition to the classic dimensions of Pleasure-Activation-Dominance originally proposed by Mehrabian and Russel in 1974 (Kim *et al*., 2014). Emotion regulation is one of the ways in which the impact of hedonic and utilitarian value on the organism has been evaluated in the S-O-R

print ISSN: 1390-6291; electronic ISSN: 1390-8618

model. Emotional regulation is understood as the behaviors and abilities of a person that serve to modulate, inhibit or enhance the emotional experience and its expression (Calkins and Hill, 2007). The hedonic and also the utilitarian purchase value can evoke positive emotional responses in the consumer and the increment of the emotional response increases the probability of purchase in the virtual store (Bui and Kemp, 2013; Peng and Kim, 2014). Finally, the intention to buy or use a product or service is often used as a substitute for behavior since it is assumed that intentions are good indications of what people will actually do. Evidence corroborates the effect of positive attitude towards online shopping and emotion on purchase intention (Kim and Park, 2005; Peng and Kim, 2014) and the predictive validity of behavioral intentions (Sheeran, 2002).

The evidence confirms the robustness of the S-O-R model to account for consumer behavior in virtual stores (Prashar *et al*., 2017; Moon *et al*., 2017; Xiao *et al*., 2019) as well as its flexibility to include new variables with status of background stimulus and mediator variables (Zhu *et al*., 2020) which endorses the theoretical and applied value of continuing the research in the area (Saricam, 2023). The present work continues the exploration of the relationship between variables included in the S-O-R model as adapted by Peng and Kim (2014), incorporating an alternative measurement of environmental elements, classified into computer and human factors (Richard, 2005; Hausman and Siekpe, 2009), on the assumption that these variables configure the web atmosphere in a more complete way and could optimize the prediction of the purchase in virtual stores, which is knowledge of great value for the planning and execution of marketing strategies in the electronic retail. For statistical robustness, two control variables were also incorporated in the analysis, sex and age, as direct predictors of repurchase intention.[1]

Materials and methods

Based on the previous review, the present work evaluates the effect of the web atmosphere of the store in terms of computer and human characteristics, together with the hedonic and utilitarian purchase value, on the attitude towards online shopping and emotional purchases, understood as variables mediators, which have a final impact on the intention to buy back in an online pharmacy retail with presence in Venezuela and Colombia. The conceptual proposal conforms to the S-O-R model of environmental psychology. Following the terminology of Peng and Kim (2014), the working hypothesis relating the relationship of the internal influences of the stimulus with the organism are defined as follows:

H_1: There is a positive relationship between the hedonic shopping value and the attitude toward online shopping.

H_2: There is a positive relationship between the utilitarian shopping value and the attitude toward online shopping.

H_3: There is a positive relationship between the hedonic shopping value and the emotional purchases.

H_4: There is a positive relationship between the utilitarian shopping value and the emotional purchases.

Similarly, the hypothesis relating the external stimuli, represented here by the two variables computer and human factors, with the organism are defined as follows:

H_5: There is a positive relationship between the computer factor and the attitude toward online shopping.

H_6: There is a positive relationship between the human factor and the attitude toward online shopping.

H_7: There is a positive relationship between the computer factor and the emotional purchases.

H_8: There is a positive relationship between the human factor and the emotional purchases.

The direct impact of sex and age on repurchase intention are formulated as follows:

1 The inclusion of control variables was kindly suggested by an anonymous referee.

H_9: There is a relationship between sex and the repurchase intention.

H_{10}: There is a positive relationship between the age and the repurchase intention.

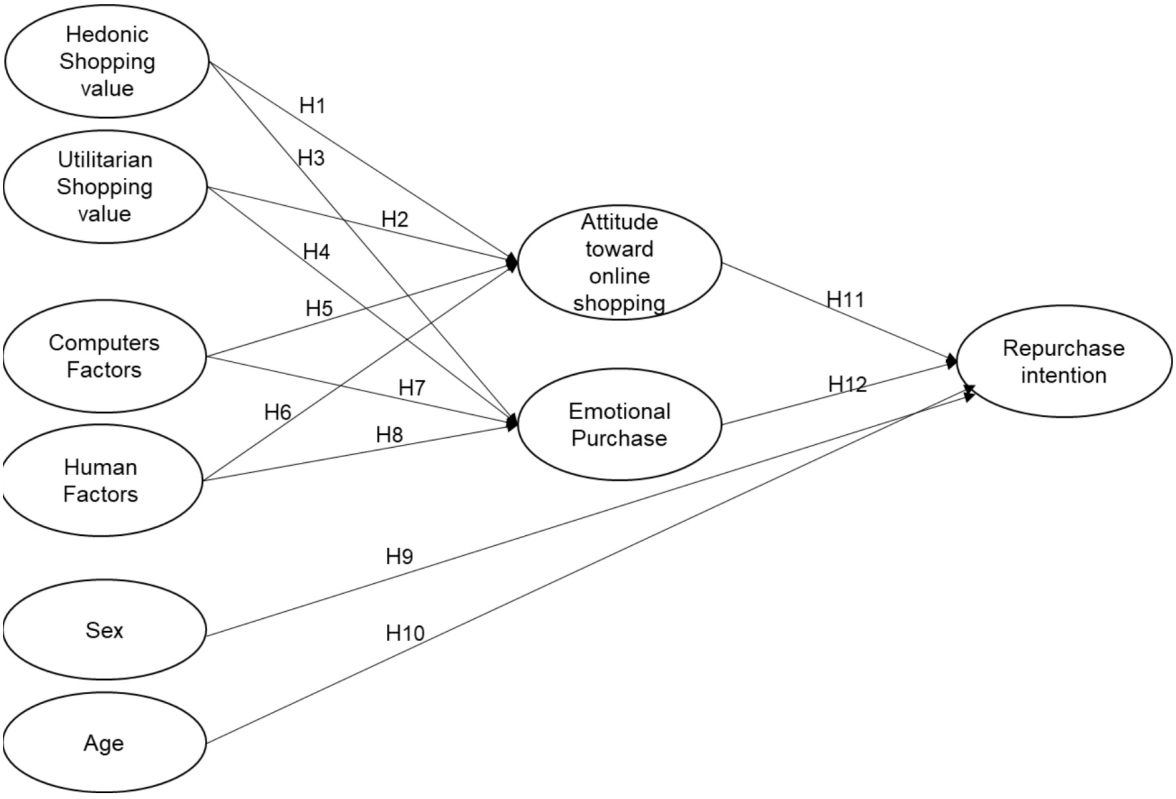
Finally, the hypothesis relating the organism with the response are defined as follows:

H_{11}: There is a positive relationship between attitude toward online shopping and the repurchase intention.

H_{12}: There is a positive relationship between the emotional purchases and the repurchase intention

The relationship between the variables is represented in Figure 1. Structural equation models were used to evaluate, initially, the reliability and validity of the measure and, afterwards, the relationships between the variables (Hair *et al.*, 2006).

Figure 1
Proposed research model



Instruments

The measurement instrument used is based on the questionnaire used by Peng and Kim (2014) and the one by Hausman and Siekpe (2009). From the instrument of Peng and Kim (2014), the items of hedonic purchase value (5 items) and utilitarian (5 items) correspond to the scale of Babin *et al*. (1994), who endorse its reliability, construct validity and nomological validity from exhaustive psychometric checks on multiple samples. Attitude toward online shopping was evaluated with 4 items taken from the work of Lee (2007), the variable Emotional purchases included 3 items proposed and validated by Bui and Kemp in 2013 and the intention to buy back was measured with 4 items that explore the probability, security and opportunity to buy again in the virtual store. All

print ISSN: 1390-6291; electronic ISSN: 1390-8618

items are measured on a 7-point Likert scale of agreement-disagreement.

Peng and King (2014) carried out the evaluation of the reliability and validity of these measures and reported Cronbach's alpha values between 0.74 and 0.89 for all subscales as a test of the internal consistency of the measures. Likewise, they carried out a confirmatory factor analysis that revealed an adequate adjustment of these measures.

Hausman and Siekpe (2009) built and validated an instrument to evaluate computer and human factors as elements of the web atmosphere. Initially, they collected a large number of website characteristics from interviews with novice users and website experts. After a purification process, with the intervention of expert judges and independent user samples that reduced the first list of elements in each category, an exploratory factor analysis was carried out, resulting in 7 elements clearly designated as Human Factors and 15 as Computer Factors. In the present study, these computer and human factors were included, and the importance assigned by consumers was evaluated on a 7-point Likert scale (not important - very important).

Castillo (2021) used this instrument after conducting a pilot study that included the translation, revision and adjustment of the items by expert judges in languages and psychometrics, to guarantee their understanding and adaptation to the Spanish-speaking sample. The evaluation of the internal consistency of the subscales indicated their adequate reliability: the lowest Cronbach alpha coefficient was 0.71 and the highest was 0.88; values that are in a range considered adequate (Nunnally, 1978)

Participants

To evaluate the repurchase intention, an online survey was conducted. Out of the 620 participants who answered the survey, 314 had not made a purchase on the online platform of a retail pharmacy in the previous three months. Therefore, the analysis was made with the remaining non-probabilistic sample of 306 consumers: 66.3% of the sample was made up of women and the remaining 33.7% were men. The mean age was 33.8 years, the median age was 30 years, and the standard deviation was 12.7 years. 96% of the sample affirmed to reside in Venezuela and around 3.9% of the sample declared to reside in other countries such as Argentina, Colombia, Mexico and El Salvador.

Results and discussion

Measurement model

A development strategy was followed where the model was modified until the best possible version of both the measurement and structural models was achieved (Hair *et al*., 2006). As a first step, the reliability of the constructs was evaluated from Cronbach's alpha coefficient, which yielded values greater than 0.80, except for Human factors (HF) ($\alpha = 0.74$), Utilitarian shopping value ($\alpha = 0{,}76$) and Attitude toward online shopping (AOS) ($\alpha = 0.79$). Once the internal consistency was verified, the structural model was established, using R's *lavaan* (0.6-8) package. To identify the factorial model, the variance standardization method was used, which sets the variance of each factor to one (1) but freely estimates all charges. In the first measurement model evaluated, an item of the Utilitarian shopping value (USV) construct was eliminated from the result of the item-test correlation. The comparative indices achieved between the theoretical model and the proposed model indicated modest adjustments and, in the convergent validity analysis, it was observed that the value of the average variance extracted from the CF and HF constructs was around 0.35, well below the traditional cut-off point of 0.5 (Fornell and Larcker, 1981). In order to improve the measurement model, the correlations between the constructs were analyzed, some items were discarded, and the reliability was again evaluated. The consequence of these modifications was the elimination of the Human factors construct.

The set of indicators of the final model is shown in Table 1 together with the standardized loads resulting from the measurement model, the value of Cronbach's alpha and the average variance extracted (AVE) for each of the constructs.

There was an improvement in the Tucker-Lewis (0.832) and CFI (0.854) fit indices indicating an adequate fit. Likewise, both the RMSEA (0.092) and the SMRM (0.078) are in an acceptable range.

Table 1
CFA results for the measurement model

Factors and elements	Std. loadings	α	AVE
Hedonic shopping value (HSV)		0,87	0,52
Online shopping is truly a joy	0,78		
Compared to other things I could have done, the time spent online shopping was truly enjoyable	0,83		
I enjoyed the online shopping trip for its own sake, not just for the items I may have purchased.	0,85		
During online shopping, I felt the excitement of hunt.	0,63		
During online shopping, I felt a sense of adventure	0,63		
Utilitarian shopping value (USV)		0,87	0,65
I accomplished just what I wanted to on the online shopping trip.	0,83		
I could buy what I really needed.	0,87		
The prices of the products and services I purchased from online were at the right level and good quality.	0,67		
I feel my online shopping trip was successful.	0,83		
Computer factors (CF)		0,84	0,49
Clear displays of page contents	0,71		
Presence of clear menu items on each page	0,72		
Up-to-date information	0,73		
Logical webpage information	0,64		
Offers order confirmation	0,76		
Attitude toward online shopping (AOS)		0,79	0,47
I enjoy buying things through the Internet.	0,79		
I prefer online shopping.	0,72		
Purchasing in the online stores generally benefits the consumers.	0,56		
Online shopping is a good thing.	0,69		
Emotional purchase (EP)		0,71	0,55
In general, I often do the emotional shopping through Internet.	0,76		
I frequently shop online to cope with my emotions.	0,72		
Repurchase intention (RI)		0,85	0,76
I will likely repurchase in the online store.	0,91		
I will have the certain chance to repurchase in the online store.	0,82		

In the last contrasted measurement model, inspection of the results from Table 1 reveals that the lowest load is found at 0.56, which exceeds the criterion established by Netemayer *et al.* (2003) of 0.50. The composite reliability of the model is equal to 0.97, which gives evidence in favor of an adequate fit.

The mean variance extracted from the constructs reached values greater than 0.50 except for AOS (AVE = 0.47), which, however, is very close

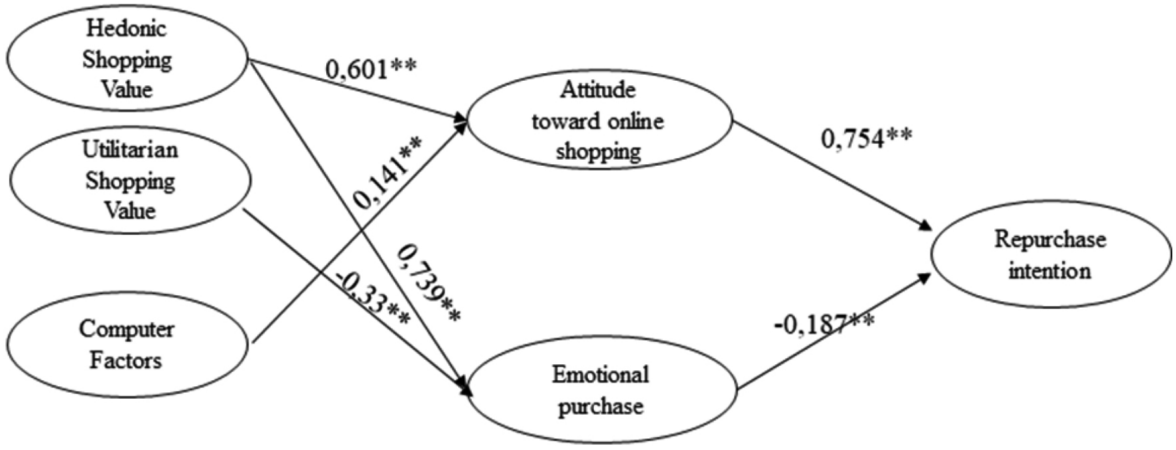
print ISSN: 1390-6291; electronic ISSN: 1390-8618

to this cut-off point, so convergent validity is considered acceptable (Fornell and Larcker, 1981). None of the squared correlations of the constructs was greater than the average variance extracted from any of the constructs, which confirms that the measure has discriminant validity. In view of the results, and after the modifications to the original model, it can be affirmed that the measurement model is acceptable: the constructs are reasonably represented by the included indicators.

Structural model

Once a measurement model with an acceptable fit was achieved, the structural model was evaluated (Hair *et al*., 2006). SEM techniques have been used to model consumer behavior in many contexts (Forero-Batista and Ortegón-Cortazar, 2023). Regarding the relationship model obtained, the estimated structural parameters corresponding to direct effects are shown in the following Figure 2. The greatest impact is recorded in the effect of the Hedonic Shopping Value (HSV) on Emotional purchases (EP), followed by the Attitude towards online shopping (AOS) on the Repurchase Intention (RI) and again the Hedonic Shopping Value (HSV) on the AOS.

Figure 2
Results of the structural model



** significant at p-value <0.01; All coefficients are standardized.
Note. Square multiple correlacion (SMC)= Attitude toward online: 0,43; Emotional Purchase: 0,33; Repurchase Intention: 0,51.

In this way, HSV is confirmed as a motivating antecedent element with a moderately high and statistically significant impact on the two variables considered mediators, namely, AOS and EP. The multisensory and emotional elements related to the shopping experience are linked to a more positive attitude towards online shopping and also promote greater emotional regulation at the time of purchase. This agrees with the results reported by Peng and Kim (2014), where hedonic values were shown to be antecedents of the attitude towards online shopping and emotional buying, while Moon *et al.* (2017) have also confirmed that the perception of hedonic attributes are predictors of the attitude towards online shopping.

On the other hand, a direct effect of USV on both AOS and EP was expected. The utilitarian value does not affect the attitude toward online shopping, according to sample results. These results only allow us to accept the hypothesis that relates USV with PE. Utility Value has a moderate, negative directional impact on EP. Utilitarian Value reflects an orientation towards

acquiring products in an efficient, cognitive and task-oriented manner and this indicates, in the present case, that consumers with high Utilitarian Purchase Value do not tend to use purchases as a regulator of emotions. According to Koo and Ju (2010), the informative and utilitarian aspects of the online store page have an influence on the emotional state and the purchase intention. Previous results from Peng and Kim (2014) found no relationship between USV and EP and confirmed the relationship between USV and AOS.

For Hausman and Siekpe (2009) Computer Factors (CF) such as organization, clear menus, security and privacy, make consumers understand the design of the website and navigate in search of products and buy what is offered, resulting in a positive attitude towards the site that favors the purchase intention, in line with the results obtained in this research. Thus, the results found in this study indicate a direct and low effect on the attitude towards online shopping. When users value aspects of the page's atmosphere linked to design, menus and information more positively, this impacts a more favorable attitude towards online shopping. Anaya-Sánchez *et al.* (2020) found, in this same direction, that web design influences purchasing attitude and behavior in electronic commerce. However, and contrary to one of the hypotheses of this study, these factors, which facilitate and make the web page understandable, do not exert any influence on EP.

Although Hausman and Siekpe (2009) report that the characteristics of the web interface include both human and computer design elements, and that both have positive effects and are antecedents of the purchase, the relevance of HF could not be validated.

No direct effect of sex nor age on the repurchase intention was found (Age: β=-0.076; p=0.12 and Sex: β=-0.059; p=0.23) and this is an interesting result for marketing managers, as they can direct their efforts to large markets that are not differentiated by these variables but rather by the variables that were found significant in this study. However, this result cannot be considered conclusive and further exploration on the impact of these, and other demographic variables is suggested.

On the other hand, findings show that both AOS and EP are predictive variables of repurchase intention. In their work, Peng and Kim (2014) only found a statistically significant relationship between the attitude towards online shopping and the intention to repurchase. The literature in the area suggests that AOS is an important predictor of purchase intention as verified here, consistent with the results reported in Moon *et al.* (2017) and Hebbar *et al.* (2020). Likewise, the negative and statistically significant relationship found between EP and RI indicates that people do not use their emotions as regulators of purchases of health and personal care products, which may account for the difference with the results reported by Peng and Kim (2014).

Finally, the present study did not find support for the hypothesis relating the value of USV and the AOS or between CF and EP. The absence of a relationship between the utilitarian purchase value and the attitude toward online shopping could be linked to the attitude measure used here: the utilitarian shopping value corresponds to cognitive attributes that evaluate the benefit and possible success of the purchase, while the attitude toward online shopping measure highlights the affective evaluation of the purchase. Likewise, it is necessary to point out that the computer factors measure used is different from the one included in the study by Kim and Peng (2014) and this may account for the differences in the results. Research in the area shows the existence of different ways of operationalizing computer elements or technological factors (Richard, 2005; Gatautis and Vaiciukynaite, 2013), which indicates the need to continue working on the validity of the measures of these constructs.

Conclusions

The study presents evidence that the theoretical framework of the S-O-R model is appropriate for studying online purchasing behavior. The results confirm that the elements of the web atmosphere, hedonic and utilitarian shopping values, in addition to computer factors, together with individual factors, influence online purchase behavior.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

The results obtained add value by showing that there is flexibility in the incorporation of mediating variables, such as attitude and emotions, on the repurchase intention in virtual stores. In the original model by Donovan and Rossiter (1982) and later in the adaptation carried out by Eroglu *et al*. (2001) these factors have always been present even when they have been conceptualized in different ways (Hebbar *et al*, 2020). The measurement and confirmation of the impact of these variables, as reported in previous research, contributes to the solidity of the S-O-R model.

Regarding the role of hedonic and utilitarian values, it is interesting to note that these variables have played a role both as antecedents (Prashar *et al*., 2017) and as mediators of the purchase response (Sütütemiz and Saygılı, 2020). In both roles, there is evidence of their impact. In this study, its role as an antecedent is verified; although it continues to be a research area to explore and to establish its impact in online shopping.

Additionally, it is important to point out that progress is made by incorporating antecedent variables linked to characteristics of the web interface. Clarifying which of the many and varied factors are relevant as determinants of online purchase behavior is an area of fruitful research, as exemplified in the work of Zhu *et al.* (2020).

On the other hand, this study contributes to the literature on the Internet and offers valuable information for online pharmacy retail. Findings provide useful information for the design of the online shopping environment and for setting up marketing strategies. For example, given the effect of hedonic purchase value on both online shopping attitude and repurchase intention, it is recommended that retailers design pleasant and entertaining shopping experiences for their customers along with attractive products that satisfy the feeling of enjoyment, pleasure, and adventure during shopping. It seems that in online stores it is necessary to add elements that make the shopping experience more pleasant and exciting to guarantee repurchase. In a web dedicated to the sale of pharmacy and personal care products, it seems advisable to add information on utilitarian aspects such as price, assortment, and availability of products to promote recurring purchases in line with our results.

Based on the present findings, it seems relevant to consider computer factors for the design of online retailer's strategies. Results suggest that a friendly, easy to use and simple web design can influence the attitude towards online shopping and thus the intention to repurchase. A better understanding of how these computing characteristics translate to target customers will provide guidelines for the design of environments that favor purchase.

In future research and to overcome some limitations, it would be convenient to review and optimize the indicators of the included constructs to obtain a better approximation to their measurement. Likewise, it is recommended to apply the instrument in larger and different samples in order to increase the generalization of the results. It is important to reconsider the inclusion of other variables within the S-O-R model that may account for online purchase and repurchase intention. The related literature shows that multiple variables have been included in the model in the area: a meta-analysis would be a convenient way to discriminate and select those constructs that have shown greater predictive power in the case of online purchases.

References

Anaya-Sánchez, R., Castro-Bonaño, J. M. and González-Badía, E. (2020). Millennial consumer preferences in social commerce web design. *Revista Brasileira de Gestão de Negócios*, *22*, 123-139. https://doi.org/10.7819/rbgn.v22i1.4038

Ajzen, I. (2008). Consumer Attitudes and Behavior. En C. P. Haugtvedt, P. M. Herr y F. R. Kardes (eds.), *Handbook of Consumer Psychology* (pp. 525-548). Lawrence Erlbaum Associates.

Anwar, A., Waqas, A., Zain, H. M. and Kee, D. M. H. (2020). Impact of music and colour on customers' emotional states: An experimental study of online store. *Asian Journal of Business Research*, *10*(1), 104-125. https://doi.org/10.14707/ajbr.200077

Babin, B. J., Darden, W. R. and Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of consumer research*, *20*(4), 644-656. https://doi.org/10.1086/209376

Baker, J., Grewal, D. and Parasuraman, A. (1994). The Influence of Store Environment on Quality Inferences and Store Image. *Journal of the Academy of Marketing Science*, *22*(4), 328-339. https://doi.org/10.1177/0092070394224002

Bui, M. and Kemp, E. (2013). E-tail emotion regulation: examining online hedonic product purchases. *International Journal of Retail & Distribution Management*, *41*(2), 155-170. https://doi.org/10.1108/09590551311304338

Calkins, S. D. and Hill, A., (2007). The emergence of emotion regulation: Biological and behavioral transactions in early development. En J. Gross, ed. *Handbook of Emotion Regulation* (pp. 229–248). Guilford Press.

Castillo, E. (2021). *Environment, hedonic and utilitarian purchase value in the intention to repurchase in online stores: an approach from the S-O-R model.* (Bachelor's degree). Andrés Bello Catholic University. Universidad Católica Andrés Bello.

Dailey, L. (2004). Navigational web atmospherics: Explaining the influence of restrictive navigation cues. *Journal of Business Research*, *57*(7), 795-803. https://doi.org/10.1016/S0148-2963(02)00364-8

De Aguiar, S., Jucá de Queiroz, M., Bernardes de Queiroz, R. S. and Ascenção Guedes, L. F. (2019). The importance of the atmosphere of the environment in Brazilian physical retail in 2030. *Brazilian Journal of Management*, *12*, 1278-1292. https://doi.org/10.5902/19834659 41854

Donovan, R. J., Rossiter, J. R., Marcoolyn, G. and Nesdale, A. (1994). Store atmosphere and purchasing behavior. *Journal of retailing*, *70*(3), 283-294. https://doi.org/10.1016/0022-4359(94)90037-X

Donovan, R. J. and Rossiter, J.R. (1982). Store atmosphere: an environmental psychology approach. *Journal of retailing*, *58*(1), 34-57.

Eroglu, S. A., Machleit, K. A. and Davis, L. M. (2001). Atmospheric qualities of online retailing: A conceptual model and implications. *Journal of Business research*, *54*(2), 177-184. https://doi.org/10.1016/S0148-2963(99)00087-9

Forero-Bautista, A. and Ortegón-Cortázar, L. (2023). ¿Por qué visitar lifestyle centers? Variables alternativas de atracción a través de un modelo de ecuaciones estructurales. *RETOS. Revista de Ciencias de la Administración y Economía*, *13*(25), 87-103. https://doi.org/10.17163/ret.n25.2023.06

Fornell, C. and D. Larcker. (1981). Evaluating structural equation models with unobservable and measurement error. *Journal of Marketing Research*, *18*(1), 39-50. https://doi.org/10.2307/3151312

Gatautis, R. and Vaiciukynaite, E. (2013). Website atmosphere: towards revisited taxonomy of website elements. *Economics & Management, 18*(3), 537-544. http://dx.doi.org/10.5755/j01.em.18.3.5285

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2006). *Multivariate data analysis*. Prentice Hall.

Hausman, A. V. and Siekpe, J. S. (2009). The effect of web interface features on consumer online purchase intentions. *Journal of Business research*, *62*(1), 5-13. https://doi.org/10.1016/j.jbusres.2008.01.018

Hebbar, S., Kamath, G. B., Mathew, A. O. and Kamath, V. (2020). Attitude towards online shopping and its influence on purchase intentions: an urban Indian perspective. International *Journal of Business Innovation and Research, 22*(3), 326-341.https://doi.org/10.1504/IJBIR.2020.107961

Kim, Y. K. Park, S. H (2005). A consumer shopping channel extension model: attitude shift toward the online store. *Journal of Fashion Marketing and Management*, *9*(1), 106-121. http://dx.doi.org/10.1108/13612020510586433

Kim, Y. K., Lee, M. Y. and Park, S. H. (2014). Shopping value orientation: Conceptualization and measurement. *Journal of Business Research*, *67*(1), 2884-2890. https://doi.org/10.1016/j.jbusres.2012.06.006

Koo, D. M. y Ju, S. H. (2010). The interactional effects of atmospherics and perceptual curiosity on emotions and online shopping intention. *Computers in Human Behavior*, *26*(3), 377-388. https://doi.org/10.1016/j.chb.2009.11.009

Kotler, P. (1973). Atmospherics as a marketing tool. *Journal of retailing*, *49*(4), 48-64.

Lee, B. C. Y. (2007). Consumer attitude toward virtual stores and its correlates. *Journal of Retailing and Consumer services*, *14*(3), 182-191. https://doi.org/10.1016/j.jretconser.2006.07.001

Manganari, E. E., Siomkos, G. J. and Vrechopoulos, A. P. (2009). Store atmosphere in web retailing. *European Journal of Marketing, 43*(9-10), 1140-1153. https://doi.org/10.1108/03090560910976401

Mehrabian, A. and Russel, J. (1974). *An approach to Environmental Psychology*. MIT Press.

Moon, M. A., Khalid, M. J., Awan, H. M., Attiq, S., Rasool, H. and Kiran, M. (2017). Consumer's perceptions of website's utilitarian and hedonic attributes and online purchase intentions: A cognitive–affective attitude approach. *Spanish Journal of Marketing-ESIC*, *21*(2), 73-88. https://doi.org/10.1016/j.sjme.2017.07.001

Nunnally, J. C. (1978). *Psychometric theory*. McGraw-Hill.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Peng, C. and Kim, Y. G. (2014). Application of the stimuli-organism-response (SOR) framework to online shopping behavior. *Journal of Internet Commerce*, *13*(3-4), 159-176. https://doi.org/10.1080/15332861.2014.944437

Picot-Coupey, K., Krey, N., Huré, E. and Ackermann, C. L. (2021). Still work and/or fun? Corroboration of the hedonic and utilitarian shopping value scale. *Journal of Business Research*, 126, 578-590. https://doi.org/10.1016/j.jbusres.2019.12.018

Prashar, S., Sai Vijay, T. and Parsad, C. (2017). Effects of online shopping values and website cues on purchase behaviour: A study using S–O–R framework. *Vikalpa*, *42*(1), 1-18. https://doi.org/10.1177%2F0256090916686681

Richard, M. O. (2005). Modeling the impact of internet atmospherics on surfer behavior. *Journal of Business research*, *58*(12), 1632-1642. https://doi.org/10.1016/j.jbusres.2004.07.009

Sheeran, P. (2002). Intention behavior relations: a conceptual and empirical review. *European review of social psychology*, *12*(1), 1-36. https://doi.org/10.1080/14792772143000003

Saricam, C. (2023). Analyzing the influence of store atmospherics on younger generation in apparel retail market with an extended SOR model. *Journal of Global Fashion Marketing*, *14*(2), 143-156. https://doi.org/10.1080/20932685.2022.2032794

Spence, C. (2022). Experimental atmospherics: a multi-sensory perspective. *Qualitative Market Research: An International Journal*, *25*(5), 662-673. https://doi.org/10.1108/QMR-04-2022-0070

Shukla, S. (2019). Neuromarketing: a change in marketing tools and techniques. International *Journal of Business Forecasting and Marketing Intelligence*, *5*(3), 267-284. https://doi.org/10.1504/IJBFMI.2019.104044

Sütütemiz, N. and Saygılı, M. (2020). The effects of hedonic and utilitarian shopping motivations on online purchasing intentions: a Turkish case study. *The retail and marketing review*, *16*(1), 61-83. https://hdl.handle.net/10520/EJC-1ea7711ded

Xiao, L., Guo, F., Yu, F. and Liu, S. (2019). The effects of online shopping context cues on consumers' purchase intention for cross-border E-Commerce sustainability. *Sustainability*, *11*(10), 2777. https://doi.org/10.3390/su11102777

Zhang, P. and Von Dran, G. M. (2000). Satisfiers and dissatisfiers: A two-factor model for website design and evaluation. *Journal of the American society for information science*, *51*(14), 1253-1268. https://doi.org/10.1002/1097-4571(2000)9999:9999%3C::AID-ASI1039%3E3.0.CO;2-O

Zhu, B., . and Satanasavapak, P. (2020), Generation Y consumer online repurchase intention in Bangkok: Based on Stimulus-Organism-Response (SOR) model. *International Journal of Retail & Distribution Management*, *48*(1), 53-69. https://doi.org/10.1108/IJRDM-04-2018-0071

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.35-50
https://doi.org/10.17163/ret.n27.2024.03

Satisfaction with online clothing shopping: an analysis of its background

Satisfacción con la compra de ropa en línea: análisis de sus antecedentes

Judith Cavazos-Arroyo
Professor at Universidad Popular Autónoma del Estado de Puebla, Mexico
judith.cavazos@upaep.mx
https://orcid.org/0000-0002-6258-289X

Aurora Máynez-Guaderrama
Professor at Universidad Autónoma de Ciudad Juárez
amaynez@uacj.mx
https://orcid.org/0000-0001-8174-3807

María Marisela Vargas-Salgado
Professor at Universidad Autónoma de Ciudad Juárez
maría.vargas@uacj.mx
https://orcid.org/0000-0002-9670-5982

Received on: 11/01/24 **Revised o**n: 06/02/24 **Approved** on: 20/02/24 **Published** on: 01/04/24

Abstract: companies that understand which variables drive customer satisfaction can establish stronger metrics and refine their strategies. Currently, there is an exponential growth in fashion shopping through digital platforms. Our research assesses if fast fashion and slow fashion orientation, environmental awareness, and product, emotional, and website experiences have an effect on satisfaction with online shopping. Moreover, the importance and performance of experiences on satisfaction is analyzed. Statistical techniques used are a structural equation model based on partial least squares and an importance-performance matrix. The research design was quantitative, explanatory, and cross-sectional, conducted in the northern border of Mexico and applied to 539 clothing shoppers on web platforms or digital applications. The results show that only the slow fashion orientation influences environmental awareness, unlike the fast fashion orientation that does not have an effect on it, environmental awareness has a positive impact on the three types of experience, and they favorably impact satisfaction with the purchase of clothing online. The importance-performance matrix revealed that the website/app experience is the most relevant factor for online satisfaction. In conclusion, satisfaction with online shopping is highly dependent on the website experience.

Keywords: satisfaction, fashion, awareness, environment, sustainability, experience, online, customer.

Resumen: cuando las empresas comprenden las variables que impulsan la satisfacción de los clientes, pueden establecer mejores puntos de referencia y perfeccionar sus estrategias. En la actualidad, existe un crecimiento exponencial de las compras de ropa de moda a través de plataformas digitales. Esta investigación evalúa si la orientación a la moda rápida y a la moda lenta, la conciencia ambiental y las experiencias del producto, emocional y con el sitio web inciden sobre la satisfacción con la compra en línea. Además, se analiza la importancia y el rendimiento de las experiencias sobre la satisfacción. Las técnicas estadísticas utilizadas son un modelo de ecuaciones estructurales basados en mínimos cuadrados parciales y una matriz de importancia-desempeño. El diseño de investigación fue cuantitativo, explicativo y transversal, desarrollado en la frontera norte de México y aplicado a 539 compradores de ropa en plataformas web o aplicaciones digitales. Los resultados evidencian que solo la orientación a la moda lenta influye sobre la conciencia ambiental, a diferencia de la orientación a la moda rápida que no tiene efecto en ella, la conciencia ambiental tiene un impacto positivo sobre los tres tipos de experiencia y éstos inciden favorablemente sobre la satisfacción con la compra de ropa en línea. La matriz importancia-desempeño evidenció que la experiencia con el sitio web/app es el factor más relevante para la satisfacción en línea. En conclusión, la satisfacción con la compra en línea depende en gran medida de la experiencia con el sitio web.

Palabras clave: satisfacción, moda, conciencia, sostenibilidad, medioambiente, experiencia, online, cliente.

Suggested citation: Cavazos-Arroyo, J., Máynez-Guaderrama, A. and Vargas-Salgado, M. M. (2024). Satisfaction with online clothing shopping: an analysis of its antecedents. *Retos Revista de Ciencias de la Administración y Economía*, *14*(27), 35-50. https://doi.org/10.17163/ret.n27.2024.03

Introduction

Online shopping has maintained sustained growth because it represents a cheaper and more convenient procurement method compared to traditional purchases (Vasić *et al*., 2019). In addition, this new format revolutionized the way we purchase products, as they allow customers to buy at any time and from anywhere (Ellison *et al*., 2021), place orders, pay with digital means and receive what they have bought where they want (Rita *et al*., 2019). Therefore, aspects such as customer experience and satisfaction with online shopping are crucial for organizations, although they are seen as a challenge for e-commerce (Mamakou *et al*., 2023; Rita *et al*., 2019).

Previous work indicates that when the variables that drive customer satisfaction are understood, companies can establish better benchmarks and refine their strategies (Mofokeng, 2021; Vasic *et al*., 2019). An example of this is found in the fashion industry. In this sector, there is an exponential growth in purchases through digital platforms and shopping experiences and consumer satisfaction are recognized as fundamental factors for the value proposition (Kautish *et al*., 2022). However, there are challenges for fashion clothing brands selling online, especially in relation to issues such as social and ecological responsibility and the need to ensure that customers are satisfied (Gutiérrez Rodríguez *et al*., 2020). Therefore, this research work has two objectives. The first is to evaluate a structural model of satisfaction with online shopping, which includes as background the orientation to fast and slow fashion, environmental awareness and product, emotional and website experiences. The second purpose is to analyze the importance and performance of the three types of experience on online shopping satisfaction, using an importance-performance matrix. In addition to the introduction, the article includes five more sections: literature review, method, results, discussion and conclusions.

Satisfaction with online shopping

Customer satisfaction with online shopping (e-satisfaction) can be defined as the customer's assessment of their experience of the service received when they made a commercial transaction through electronic platforms or applications (Gutiérrez Rodríguez *et al*., 2020; Miao *et al*., 2022). Generally, the evaluation of customer satisfaction in the e-commerce environment is associated with aspects of the website such as ease of use, reliability and privacy and, once the purchase is made, other factors such as delivery times and even security become relevant (Mofokeng, 2021; Trivedi and Yadav, 2020). As a one-dimensional construct, general satisfaction with the seller is usually evaluated, as well as post-purchase affective and cognitive evaluations (Fuentes-Blasco *et al*., 2017).

Among the main differences between traditional retail and online retail is the lack of physical and human interaction that normally takes place in traditional stores (Yeh *et al*., 2022). In the context of the fashion industry, customer satisfaction is frequently related to the quality and service associated with the shopping experience (Wang *et al*., 2019), as well as the reflection of feelings and emotions derived from post-purchase consumption (Cuesta-Valiño *et al*., 2022).

Fashion orientations and environmental awareness

Fashion orientation is understood as a trait or a personal predisposition towards fashion that influences consumer perceptions and purchasing behavior (Michon *et al*., 2015). In this research, two particular traits of fashion clothing consumers are studied: the orientation to fast fashion and the orientation to slow fashion. The focus on fast fashion clothing refers to the willingness of consumers to buy clothes from the latest trends from sellers that offer relatively affordable prices and renew their offer with novelties and variety in a few weeks, instead of doing it seasonally (Joung, 2014). On the other hand, the slow fashion consumer values the place where the garment is produced, if it comes from a fair trade, and if it is produced in a sustainable way; this type of consumer worries about buying items less driven by fashion trends, also seeks to use them for longer and worries about the impact of the fashion industry on workers and society (Domingos *et al*., 2022).

Environmental awareness is understood as the degree of knowledge, information and sensitivity

print ISSN: 1390-6291; electronic ISSN: 1390-8618

of people to environmental problems and their concern to solve them (Zameer and Yasmeen, 2022). For their part, the environmental awareness of fashion clothing consumers refers to their level of concern about the damages associated with the use of chemicals and the waste of products not consumed in this industry (Domingos *et al*., 2022), as well as their effect on pollution and climate change (Şener *et al*., 2022). It should be noted that unfortunately levels of environmental pollution are higher in developed countries than in underdeveloped ones (Kumar *et al*., 2021). In the academic field, it is still necessary to explore how the movements of fast and slow fashion influence variables such as environmental awareness (Santos Saraiva, 2023). Previous work argues that in the fashion industry there is a paradox in which the insatiable desire of fast fashion negatively affects variables associated with sustainability, responsibility and environmental concern and, on the contrary, the orientation to slow fashion does so in a positive way (Brewer, 2019; Rathinamoorthy, 2019). It is therefore proposed that:

H1a: Fast fashion orientation negatively influences environmental awareness in the fashion industry.

H1b: Slow fashion orientation positively influences environmental awareness in the fashion industry.

Environmental awareness and online shopping experience

The importance given to the customer experience originates from the hedonic vision of consumption, which addresses the sensory and affective gratification associated with the use of a product or service (Artusi *et al*., 2020). The shopping experience is defined as a personal and subjective response that involves the client from a set of interactions with a product or service, a company or part of an organization, that provokes an emotional, rational, sensory, physical and/or spiritual reaction (Bascur and Rusu, 2020). It is a multidimensional construct that can involve the website, the product(s), the service, the brand and even the emotion involved in the purchase (Yin & Xu, 2021). It has been identified that the experiences of consumers, both fast and slow fashion, differ, so more work has been called on to predict the behavior of both types of consumers (Yoon *et al*., 2020). This research delves into three dimensions of the experience: with the product, the website and the emotional aspect.

Experience with fast or slow fashion clothing includes aspects such as quality, price, product type, packaging quality, and the feeling of wearing it (Yin and Xu, 2021). In a study conducted in Bangladesh associated with the procurement of green products, it was found that a consumer's concern to protect the environment can impact aspects such as environmental responsibility and experience with green products (Hossain, 2022). On the other hand, an important dimension of the construction of experiences are emotions (Silva *et al*., 2021). Emotional experience in the fashion clothing industry refers to the emotions that customers experience during the buying process, i.e., when they search, decide, acquire, receive and wear the clothes (Yin and Xu, 2021). In other fields of research, such as rural tourism, it has been found that a high level of environmental awareness among tourists in China can affect their emotional experience with the product or service received (Xiaohong, 2019). Also, in pro-social studies carried out in Spain it was identified that consumers with a tendency towards environmentally responsible behavior experience intrinsic warm emotional sensations [warm glow] (Hartmann and Apaolaza-Ibánez, 2012).

Finally, it has been identified that a relevant topic for fashion clothing customers is the experience on the website (Boardman and Chrimes, 2023; Li *et al*., 2023). This refers to the assessment made by users on the attributes of a website that meet their needs and reflect its overall excellence (Aladwani and Palvia, 2002). For example, Li *et al*. (2023) analyzed the online adaptive clothing shopping experience through Amazon, finding that functional aspects associated with ease of browsing and value of experience are important components for customers during online shopping. However, previous work has not empirically proven the existence of an effect of environmental awareness on the website's experience in purchasing clothes, so this work explores the possibility of a positive effect. This proposal is

based on the fact that environmental awareness among consumers can increase the preference for shopping on websites, since this practice: reduces environmental damage by reducing car travel (which consequently reduces the emission of greenhouse gases); limits inventories, as well as waste and retail space – which decreases energy costs for lighting and air conditioning –; and optimizes the supply chain, from production to delivery or return (Tokar *et al*., 2021). It is proposed that:

H2a: Environmental awareness of the fashion industry positively influences the product experience.

H2b: Environmental awareness of the fashion industry positively influences the emotional experience.

H2c: Environmental awareness of the fashion industry positively influences the experience with the website.

Satisfaction with online shopping (e-satisfaction) is understood as a feeling of customer pleasure resulting from their shopping experience to a certain e-commerce company, in relation to their expectations and previous shopping experiences (García-Salirrosas *et al*., 2022). It has been found that customer experiences are key for their satisfaction. Work carried out in Indonesia (Mustikasari *et al*., 2021) and China (Pei *et al*., 2020), in the entertainment, technology and clothing sectors, found that experience with the product influences satisfaction with online shopping. Also, different studies in the fields of online learning (Chen *et al*., 2023), labor (Lindner *et al*., 2021), and tourism (Ratnasari *et al*., 2021) have identified that emotional experience has a positive and significant impact on satisfaction. Finally, there is empirical evidence that indicates that the experience with the website favors consumer satisfaction; such is the case of a work carried out with online retailers of fashion commerce in Spain (Gutiérrez Rodríguez *et al*., 2020). It is therefore proposed that:

H3a: The product experience positively influences the satisfaction with online shopping.

H3b: Emotional experience positively influences online shopping satisfaction.

H3c: The experience with the website positively influences the satisfaction with the online purchase.

Materials and method

The research design was quantitative, explanatory and cross-sectional. The subjects were people living on the northern border of Mexico, who participated and answered affirmatively to the following filter questions: do you agree to participate in this research work by answering this questionnaire? do you agree to have your information used anonymously and confidentially for this research? and have you bought clothes on any web platform/online app in the last 6 months? Through a non-probabilistic convenience sampling, 606 responses were received, of which 539 were usable and answered affirmatively the filter questions. To determine the sample size, the recommendation of Hair *et al*. (2019a; 2019b) was taken into consideration, in the sense of identifying the latent variable that receives the most arrows (structural paths). In the model used in this research work, the construct that meets that condition is satisfaction with the online purchase, which receives three arrows. The minimum sample size to identify an R^2 of at least 0.10, with a statistical significance of 1 % and a power of 80 % is 145 (Hair *et al*., 2019b). Descriptive statistics and exploratory factor analysis were calculated with SPSS software version 24 and for the PLS structural model the SmartPLS software version 4 was used.

Instrument. Adapted scales available in the academic literature were used (see table 1). As it is observed, environmental awareness about the fashion industry was measured with three items of Xu *et al*. (2022) scale; the Fast Fashion Orientation with six items of Gwozdz *et al*. (2015) scale; the Slow Fashion Orientation with Jung (2014) scale, which consists of five dimensions: Equity with three items, Authenticity with three items, Functionality with three items, Localism with three items and Exclusivity with three items. The shopping experience was valued according to Yin and Xu (202 1) scale and three dimensions

print ISSN: 1390-6291; electronic ISSN: 1390-8618

were considered: Experience with the website/app (5 items), Emotional experience (4 items) and Experience with the product (5 items). Likewise, the Satisfaction with online clothing purchase scale of Pei *et al*. (2020) with five items was used. All response descriptors were evaluated with a five-point Likert scale ranging from totally disagree = 1 to totally agree = 5.

Table 1
Scales used

Fast fashion orientation OMR.1. It is important for me to be trendy. OMR.2. I keep my wardrobe/*closet updated* according to the fashion changes. OMR.3. I consciously select clothes that reflect current fashion. OMR.4. I usually have one or more sets/clothes/models of the latest fashion. OMR.5. I dedicate time and effort to find out about the latest fashion. OMR.6. Having fashionable clothes that I like is very important for me.	**Orientation to slow fashion Equity** Eq1: Fair remuneration for clothing producers is important for me when I buy clothes. Eq2: I am worried about fair trade when I buy clothes. Eq3: I am concerned about the working conditions of the producers when I buy clothes. **Functionality** F1: I often combine my clothes in different ways. F2: I try to keep my clothes as long as possible, instead of getting rid of them in a short time. F3: I prefer simple and classic designs. **Authenticity** A1. I like garments made with traditional techniques A2. I think the work of Mexican artisans gives more value to clothes.	**Website/app experience** To answer the following questions, think about the website/app you use most to buy clothes. EW1: The design of the website/app is efficient and pleasant EW2: Browsing, searching and buying on the website/app is simple and easy EW3: The website/app has the necessary information (size, sizes, materials) and opinions about the products. EW4: The pictures have good quality and show the features of the products. EW5: The website/app is fast and stable.
	A3. Handmade clothing has more value than mass-produced clothing. **Localism** L1: I would rather buy clothes made in Mexico than clothes made abroad. L2: I think clothing made from Mexican materials is more valuable. L3: I think we need to support Mexican clothing brands. **Exclusivity** E1: I like limited edition clothes. E2: I'm very attracted to eclectic clothes. E3: I enjoy having clothes that others do not have.	
Environmental awareness about the fashion industry CAIM1. I am aware of the level of pollution caused to the environment by the garment industry. CAIM2. I am very concerned about the impact of the garment industry on the environment. CAIM3. I believe that buying second-hand clothes can reduce environmental pollution.	**Product Experience** EP1: The clothes have good quality EP2: Prices are good EP3: Clothing packaging is good and there is rarely damage EP4: There is a wide variety of clothes EP5: The clothes are nice and comfortable.	**Emotional experience** EE1: I enjoy shopping on this website/app EE2: Shopping on this website/app can lessen my stress EE3: I often get pleasant surprises when I shop on this website/app EE4: When I dress with products purchased on this website/app, I feel confident(a) about myself(a).

Satisfaction with buying clothes online
SCL1. I am satisfied with the purchases I make on the website/app.
SCL2. I am satisfied with the clothes I bought.
SCL3. I am satisfied with the delivery time
SCL4. I am satisfied with the website/app.
SCL5. I am satisfied with the prices of the garments offered by the website/app.

In this type of work there may be a bias of common method. To assess its existence, the single Harman factor and the variance inflation factors (VIF) were reviewed. The first criterion uses an exploratory factor analysis where the unrotated solution in a factor of all instrument items must be less than 50% of the variance (Kock *et al*., 2021). From the context of PLS-SEM, the bias of the common method is associated with the measurement method, so the analysis of the variance inflation factor (VIF) is used, which if it is greater than 3.3 it indicates collinearity and the model could present bias of the common method (Kock, 2015; Tsai and Bui, 2021). The results showed a single Harman factor of 43.603% which is less than the cut-off point, while all VIF values of the constructs are less than the maximum cut-off point.

Results and discussion

Characteristics of the participants. Most participants were women (57.9%), followed by men (40.8%) and another gender (1.36%). Regarding the occupation, most were students (60.3%), followed by employees (25.2%). The average age was 23.13 years, with a minimum of 13 years and a maximum of 53 years. The most common purchase frequency was between 2 and 3 times a year (31.5%), followed by more than 5 times a year (26.5%), 21.3% reported buying from these sites once a year and 20.6% said buying between 4 and 5 times a year.

Measurement model. First, the value and significance of factor loads, the reliability of the items and the construct, and the convergent validity of the model were reviewed. The items showed factor loads between 0.782 and 0.935, with t-values greater than 1.96 (Table 2). In addition, the items are reliable, since by squaring their factor load value, the minimum cut-off point of 50% was exceeded. In terms of convergent validity, Cronbach's Alpha values (α) and compound reliability [rho_a and rho_c] are between 0.70 and 0.95 and the extracted variance values [AVE] are greater than 0.50. Out of the 43 items evaluated, five [F1, L3, P1, P5 and W1] were eliminated, since they showed factor load values lower than 0.708 (Hair Jr. *et al*., 2020).

Table 2
Convergent validity

Construct	Items	Loads	Cronbach Alpha	Compound reliability (rho_a)	Composite reliability (rho_c)	Mean Extracted Variance (AVE)
Authenticity	A1	0.825	0.849	0.849	0.909	0.770
	A2	0.918				
	A3	0.887				
Awareness	CAIM1	0.927	0.909	0.909	0.943	0.846
	CAIM2	0.935				
	CAIM3	0.896				
Fairness	Eq1	0.863	0.844	0.844	0.906	0.763
	Eq2	0.897				
	Eq3	0.860				

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Construct	Items	Loads	Cronbach Alpha	Compound reliability (rho_a)	Composite reliability (rho_c)	Mean Extracted Variance (AVE)
Exclusivity	E1	0.876	0.824	0.826	0.895	0.740
	E2	0.797				
	E3	0.912				
	E4	0.890				
Emotional experience	EE1	0.849	0.893	0.911	0.925	0.756
	EE2	0.841				
	EE3	0.889				
Product Experience	EP2	0.907	0.873	0.874	0.922	0.798
	EP3	0.885				
	EP4	0.887				
Website/app experience	EW2	0.927	0.946	0.946	0.961	0.860
	EW3	0.921				
	EW4	0.932				
	EW5	0.930				
Functionality	F2	0.934	0.841	0.844	0.926	0.863
	F3	0.923				
Localism	L1	0.904	0.795	0.798	0.907	0.830
	L2	0.918				
Fast fashion orientation	OMR.1	0.859	0.932	0.939	0.946	0.746
	OMR.2	0.886				
	OMR.3	0.892				
	OMR.4	0.868				
	OMR.5	0.816				
	OMR.6	0.860				
Online shopping satisfaction	SCL1	0.923	0.934	0.944	0.950	0.793
	SCL2	0.916				
	SCL3	0.782				
	SCL4	0.926				
	SCL5	0.896				

The discriminant validity was determined with the heterotrait-monotrait ratio and the maximum cut-off point was 0.85 (Henseler *et al., 2015).* The measurement model meets the recommended criterion, as the HTMT ratios are less than the suggested cut-off point (Table 3).

Table 3
Discriminant validity

	Authenticity	Awareness	Fairness	Exclusivity	Emotional experience	Product Experience	Website Experience	Functionality	Localism	Orient. fast fashion
Awareness	0.681									
Fairness	0.664	0.612								
Exclusivity	0.510	0.340	0.463							
Emotional experience	0.438	0.392	0.409	0.456						
Product Experience	0.569	0.549	0.482	0.410	0.860					

	Authenticity	Awareness	Fairness	Exclusivity	Emotional experience	Product Experience	Website Experience	Functionality	Localism	Orient. fast fashion
Website/app experience	0.588	0.600	0.467	0.361	0.695	0.820				
Functionality	0.843	0.654	0.505	0.444	0.420	0.606	0.622			
Location	0.825	0.561	0.573	0.604	0.429	0.474	0.439	0.720		
Fast fashion orientation	0.415	0.373	0.479	0.554	0.466	0.425	0.394	0.301	0.402	
Online shopping satisfaction	0.541	0.461	0.453	0.372	0.743	0.816	0.779	0.537	0.462	0.424

Once the validity of the measurement model was confirmed, the structural model was evaluated. The following indicators were reviewed: VIF of the constructs, path of the proposed relationships, R^2, f^2 and Q^2. Table 4 shows the VIF values of the structural model. As discussed in advance, the recommended criterion is that these are equal to or less than 3.3 (Kock, 2015). In this model, the VIF values are between 1.0 and 3.3. The path coefficients of the model were then revised (see table 4). Out of the eight hypotheses proposed, only one [orientation to fast fashion environmental awareness about the fashion industry, beta = 0.047, t=1.145] was rejected. According to the result of the rest of the hypotheses, the orientation to slow fashion has a positive and significant impact on environmental awareness regarding the fashion industry, and the latter has a positive and significant impact on experiences with the product, the website and emotional aspect, and these three types of experiences favor satisfaction with online shopping.

Table 4

Trajectory coefficients of the structural model

Construct	Items	Loads	Cronbach Alpha	Compound reliability (rho_a)	Composite reliability (rho_c)
Hypothesis	Beta	Average	Standard deviation	Value t	p-value
Environmental awareness of the fashion industry -> Emotional experience	0.360	0.361	0.046	7,787	0.000
Environmental Awareness About Fashion Industry-> Product Experience	0.489	0.490	0.044	11,229	0.000
Environmental awareness about the fashion industry -> Experience website/app	0.557	0.557	0.039	14,445	0.000
Emotional experience -> Satisfaction purchase online	0.237	0.237	0.042	5,606	0.000
Product Experience -> Online Shopping Satisfaction	0.279	0.279	0.054	5,134	0.000
Website Experience -> Online Shopping Satisfaction	0.373	0.372	0.052	7,204	0.000
Slow Fashion Orientation -> Environmental Awareness Regarding Fashion Industry	0.613	0.611	0.042	14,705	0.000
Fast Fashion Orientation -> Environmental Awareness Regarding Fashion Industry	0.047	0.050	0.041	1,145	0.252

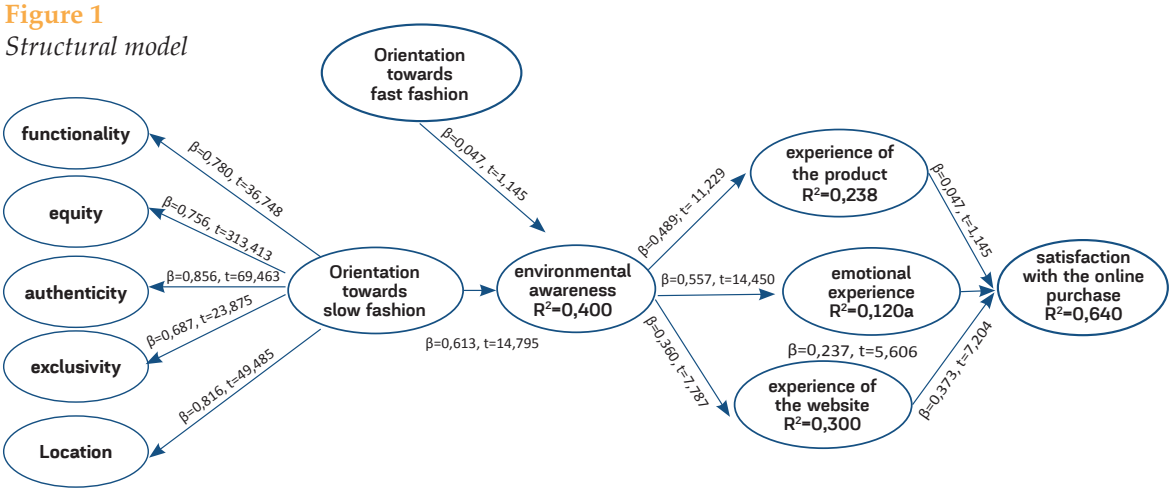
print ISSN: 1390-6291; electronic ISSN: 1390-8618

The size of the f^2 effect and the determination coefficients R^2 of the dependent constructs in the model were revised. The criteria for f^2 indicate a small effect between 0.02 and 0.14, a medium effect between 0.15 and 0.35 and large above 0.35 (Hair *et al*., 2019b). It was identified: no significant effect of rapid fashion orientation on environmental awareness (0.003); small effect of emotional experience (0.061) and product experience (0.066) on online shopping satisfaction; medium effects of environmental awareness on emotional experience (0.149) and product experience (0.315), and experience with the website/app on online shopping satisfaction (0.169); and large effects of slow fashion orientation on environmental awareness (0.479) and experience with the website/app (0.449). Regarding R^2, values around 0.25 are considered weak, 0.50 moderate, and 0.75 substantial (Hair *et al*., 2019b). The results show three weak R^2 in emotional experience (0.120), product experience (0.238), and website/app experience (0.300); and two moderate R^2 in environmental awareness (0.400) and online shopping satisfaction (0.640).

Predictive relevance was reviewed with the Q^2 indicator. Values close to a $Q^2 = 0$ indicate small relevance, around 0.25 means medium relevance, and Q^2 greater than 0.50 means large relevance (Hair *et al*., 2019b). The results showed a small relevance in emotional experience (0.172), and median relevance in environmental awareness (0.400), product experience (0.249), experience with the website/app (0.273), and satisfaction with online shopping (0.221). Regarding the indicators of goodness, a model is considered to have a good fit when the standardized mean quadratic residue (SRMR.) is less than 0.08 (Al-Maroof *et al*., 2021), although some researchers accept a limit less than 0.10 (Cangur and Ercan, 2015). The SRMR of this work was 0.08.

Regarding indirect effects, no significant effects were identified from rapid fashion orientation on emotional experience (β=0.017, t= 1.100), website/app experience (β=0.026, t=1.127), and product experience (β=0.023, t=1.123), nor from rapid fashion orientation on online shopping satisfaction (β=0.020, t=1.124). Significant indirect effects of slow fashion orientation on emotional experience (β=0.221, t=6.263), product experience (β=0.300, t=7.998), website/app experience (β=0.341, t=9.371), and online shopping satisfaction (β=0.263, t=7.861), and environmental awareness on online shopping satisfaction (β=0.430, t=11.197) were found. The contrasted model is shown in Figure 1.

Figure 1
Structural model



Model importance-performance analysis map

The results of the structural model were deepened with a map of importance-performance analysis (MAID), which compares the total effects of the structural model on a specific construct (Hair *et al*., 2019a). Five steps were developed. First, it was found that: a) the performance scores of the latent variables were in a range between

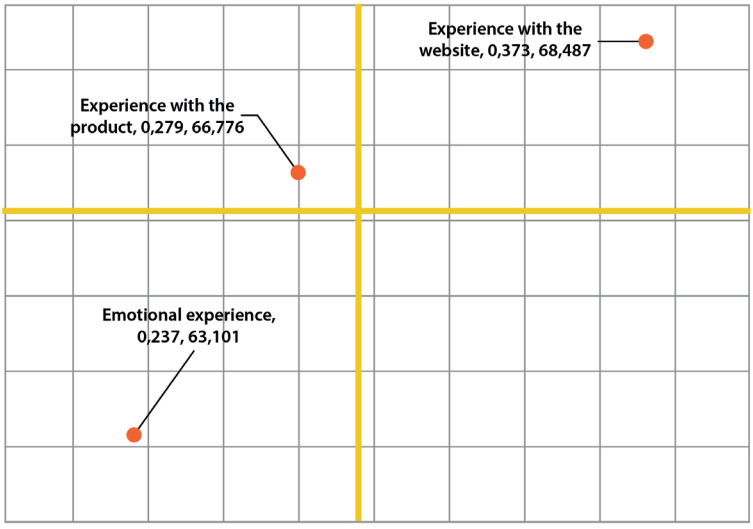
zero and one hundred; b) the indicators were encoded in the same direction and; c) the external loads of the estimators of the measurement model were positive. Then, we proceeded to examine the scores of the latent variables readjusted. Third, the effects of the latent variables on online shopping satisfaction were analyzed. It was found that the experience with the website/app is the variable that most explains the satisfaction with the online purchase, followed by the Product Experience and finally the Emotional Experience (table 5).

Table 5
Average of reset latent variables

Latent variables	Importance	Performance
Emotional experience	0.237	63,101
Product Experience	0.279	66,776
Website/app experience	0.373	68,487
Average	0.296	66,121

Fourth, the importance-performance map was created. The lower right quadrant was left empty, showing that none of the antecedent variables has high importance and low performance (Figure 2). Then, the upper right quadrant was reviewed, in which the constructs with a high level of importance and performance are located, as well as the Experience with the website/app. In the lower left quadrant was the emotional experience, with a low level of performance and importance. Finally, in the upper left quadrant was located the Experience with the product with a low importance, but a good performance.

Figure 2
Map importance-adjusted performance of constructs



As a fifth and final step, the fourth step procedure at the item level was replicated. In the lower right quadrant the indicator with the highest opportunity for improvement is "prices are good" (EP2, importance = 0.104, performance = 64.610), followed by "clothing packaging is good and it is rarely damaged" (EP3, importance = 0.101, performance = 64.332). Five items are located in the upper right quadrant: one for Product Experience and four for Website/App Experience. The

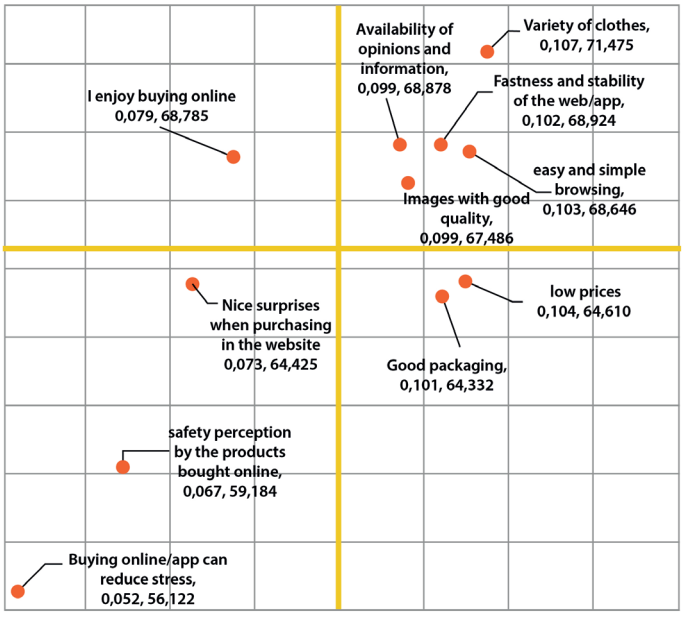
print ISSN: 1390-6291; electronic ISSN: 1390-8618

items are "There is a wide variety of clothing" (EP4, importance = 0.107, performance = 71.475), followed by "The website/app is fast and stable" (EW5, importance = 0.102, performance = 68.924), "The website/app has the necessary information (sizes, materials) and opinions about the products" (EW3, importance = 0.099, performance = 68.878), "Browsing, searching and buying on the website/app is simple and easy" (EW2, importance = 0.103, performance = 68.646), finally "The images have good quality and show the characteristics of the products" (EW4, importance = 0.099, performance = 67.486). Figure 3 shows the results.

It is expected that more and more people will choose to buy their clothes on web platforms or digital applications. This research work was carried out on the northern Mexican border and applied to people who bought clothes on some web platform or online application 6 months before the study. The evaluation of the structural model included the orientation to fast fashion and slow fashion, environmental awareness and product, emotional and website experiences.

It was proposed that the orientation to fast fashion and the orientation to slow fashion influence environmental awareness in the fashion industry, the first negatively and the second positively. Contrary to expectations, only the second relationship (H1b) was validated. Hence, the orientation to fast fashion does not influence environmental awareness as other works have identified (Brewer, 2019; Rathinamoorthy, 2019); however, in the case of consumers with orientation to slow fashion, its positive impact on environmental awareness was corroborated. Environmental awareness about the fashion industry was also considered to positively influence the product experience, emotional experience, and experience with the website. The results confirm all three proposals, as previous work (Hossain, 2022; Xiaohong, 2019). This work contributes to the advancement of knowledge by empirically proving the positive influence of environmental awareness regarding the fashion industry on the experience with the website. Then, it was proposed that the three types of experience positively affect satisfaction with online shopping. The results confirmed such proposals and thus confirmed what was found in previous work (Gutiérrez Rodríguez *et al.*, 2020; Pei *et al.*, *2020;* Ratnasari *et al.*, 2021; Zarantonello and Schmitt, 2010).

Figure 3
Matter-adjusted item performance map



On the other hand, the importance and performance of the three types of experience on online shopping satisfaction was analyzed through the importance-performance matrix. The results showed that the experience with the website/app is the most relevant factor to achieve online satisfaction. The second factor was the experience with the product and finally, the least relevant the emotional experience. Regarding the performance, the first two exhibited good levels at the aggregate level, however, at the item level it is necessary to improve both the price and the packaging. The exception at the construct level was located in the emotional experience, which showed a comparatively lower level than the other types of experience. At the item level, there are opportunities for improvement regarding the reduction of stress related with purchases on the website/app, the feeling of security by the use of products purchased on the website/app, and the reception of pleasant surprises when purchasing on the website/app.

Conclusions

This research evaluated a structural model of satisfaction with online shopping where the orientation to fast fashion and slow fashion, environmental awareness and experiences of the product, emotional aspect and the website were included as background. We also analyzed the importance and performance of the three types of experience on online shopping satisfaction, using an importance-performance matrix.

Although the rapid fashion orientation was expected to decrease environmental awareness, the research findings showed that there is no effect between these variables. The interest of consumers to keep dressed in fashion trends unfortunately comes with indifference to the environmental problems generated by this industry. The impact of the textile and fashion industry on the environment is huge, yet many end consumers still ignore it. Fortunately, slow fashion orientation has a strong positive effect on environmental awareness.

With the increase in online shopping, customer experiences are more complex. In this work, three types of experience were evaluated: with the product (e.g. price, packaging, and variety), with the emotions (e.g. taste, decreased stress, pleasant surprise), and with the website (navigation, information, opinions, images, speed and stability). Environmental awareness has a positive impact on all three types of experience, but it does so more strongly on the website. This means that consumers of fashionable clothing with greater sensitivity to environmental issues value the shopping experience with the website more than the emotional experience and with the product, specifically with regard to the quality of the images of the products, the speed and stability of the site, the simplicity and ease of browsing, the availability of information about the products, as well as the opinions about them.

Satisfaction with online shopping is explained by the three types of experience, but again it highlights the importance of the experience with the website. Unlike traditional shopping, online shopping involves not only a lack of physical and human interaction, but also the use of technological tools through websites, digital applications and social networks. Since shopping experiences are relevant to the online fashion buyer's satisfaction, organizations should develop strategies to reduce sources of stress throughout the buying and post-buying process, and strive to improve their customers' emotional experiences.

There is evidence that little attention has been paid to understanding the electronic fashion retail sector (Gutiérrez Rodríguez *et al*., 2020). This research contributes empirical evidence to knowledge in this area. The findings obtained are a call to continue investigating in the subject, particularly in online purchases in other sectors with a sustainable approach, to investigate other dimensions of the shopping experience such as service and brand, and the effect of the experience on other relevant variables such as e-WOM and intention to repurchase. Like other works, this also presents some limitations since a non-probabilistic sampling was used, with a transversal design, and was not limited to a specific consumption generation, so it is advisable that future works use a probabilistic sampling with a longitudinal

print ISSN: 1390-6291; electronic ISSN: 1390-8618

approach directed towards a generation such as the millennial or centennial.

The results of this research lead to relevant managerial implications for the retail sector that offers slow and fast fashion clothing online. On the one hand, fast fashion platforms have faced increasing scrutiny over the last few years about their environmental impact (Garg, 2020) and, in response to this, some companies started to include small lines of slow fashion products that still need to be potentialized to avoid recent accusations of greenwashing or misleading acts of inclusion of sustainable practices by companies, such as fast fashion, that could pretend to confuse the market about the veracity of their environmental intentions (Lu *et al*., 2022). Thus, according to the results found, a legitimate way to help consumers develop greater environmental awareness is to encourage the slow fashion consumer market. This would imply a transition to a more responsible and sustainable supply chain. On the other hand, more environmentally conscious consumers significantly enjoy the shopping experiences associated with products, emotions and the website, impacting satisfaction when shopping online. This opens up opportunities for an improvement in the quality of the products offered, for design processes and products to have more meaning and emotional value, and a reduction in the oversaturation of online catalogs.

References

Aladwani, A. and Palvia, P. (2002). Developing and validating an instrument for measuring user-perceived web quality. *Information & Management, 39*(6), 467-476. https://doi.org/10.1016/S03787206(01)00113-6

Al-Maroof, R. S., Alshurideh, M. T., Salloum, S. A., AlHamad, A. Q. M. and Gaber, T. (2021). Acceptance of Google Meet during the spread of Coronavirus by Arab university students. *Informatics, 8*(2), 24. https://doi.org/10.3390/informatics8020024

Artusi, F., Bellini, E., Dell'Era, C. and Verganti, R. (2020). Designing an Omni-Experience to save retailing. *Research-Technology Management, 63*(3), 24-32. https://doi.org/10.1080/08956308.2020.1733886

Bascur, C. and Rusu, C. (2020). Customer experience in retail: A systematic literature review. *Applied Sciences, 10*(21), 7644. https://doi.org/10.3390/app10217644

Brewer, M. K. (2019). Slow fashion in a fast fashion world: promoting sustainability and responsibility. *Laws, 8*(4), 1-9. https://doi.org/10.3390/laws8040024

Boardman, R. and Chrimes, C. (2023). E-commerce is king: creating effective fashion retail website designs. En Ritch, E. L., Canning, C. and McColl, J. (eds.), *Pioneering new perspectives in the fashion industry: disruption, diversity and sustainable innovation* (pp. 245-254). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80382-345-420231020

Cangur, S. and Ercan, I. (2015). Comparison of model fit indices used in structural equation modeling under multivariate normality. *Journal of Modern Applied Statistical Methods, 14*(1), 14. https://doi.org/10.22237/jmasm/1430453580

Chen, T., Luo, H., Feng, Q. and Li, G. (2023). Effect of technology acceptance on blended learning satisfaction: The serial mediation of emotional experience, social belonging, and higher-order thinking. *International Journal of Environmental Research and Public Health, 20*(5), 4442. https://doi.org/10.3390/ijerph20054442

Cuesta-Valiño, P., Gutiérrez-Rodríguez, P. and Núnez-Barriopedro, E. (2022). The role of consumer happiness in brand loyalty: a model of the satisfaction and brand image in fashion. Corporate Governance: *The International Journal of Business in Society, 22*(3), 458-473. https://doi.org/10.1108/CG-03-2021-0099

Domingos, M., Vale, V. T. and Faria, S. (2022). Slow fashion consumer behavior: a literature review. *Sustainability, 14*(5), 2860. https://doi.org/10.3390/su14052860

Ellison, B., McFadden, B., Rickard, B. J. and Wilson, N. L. W. (2021). Examining food purchase behavior and food values during the COVID-19 pandemic. *Applied Economic Perspectives and Policy 43*(1), 58-72. https://doi.org/10.1002/aepp.13118

Fuentes-Blasco, M., Moliner-Velázquez, B. and Gil-Saura, I. (2017). Analyzing heterogeneity on the value, satisfaction, word-of-mouth relationship in retailing. *Management Decision, 55*(7), 1558-1577. https://doi.org/10.1108/MD-03-2016-0138

García-Salirrosas, E. E., Acevedo-Duque, Á., Marin Chaves, V., Mejía Henao, P. A. and Olaya Molano, J. C. (2022). Purchase intention and satisfaction of online shop users in develo-

ping countries during the COVID-19 pandemic. *Sustainability, 14*(10), 6302. https://doi.org/10.3390/su14106302

Garg, P. (2020). Introduction to fast fashion: environmental concerns and sustainability measurements. In: Shukla, V., Kumar, N. (eds.), *Environmental Concerns and Sustainable Development*. Springer, Singapore. https://doi.org/10.1007/978-981-13-6358-0_18

Gwozdz, W., Gupta, S. and Gentry, J. (2015). "Fashion Sustainability" Inverstigated: Does fashion or style generate more life satisfaction? En *Marketing as provisioning technology: integrating perspectives on solutions for sustainability, prosperity, and social justice: Proceedings of the 40th Annual Macromarketing Conference* (pp. 128-144). The Macromarketing Society. https://bit.ly/3I0IXsW

Gutiérrez Rodríguez, P., Villarreal, R., Cuesta Valiño, P. and Blozis, S. (2020). A PLS-SEM approach to understanding E-SQ, E-Satisfaction and E-Loyalty for fashion E-Retailers in Spain. *Journal of Retailing and Consumer Services, 57*, 102201. https://doi.org/10.1016/j.jretconser.2020.102201

Hair Jr., J. F., Howard, M. C. Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research, 109*, 101-110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hair, J. F., Risher, J. J., Sarstedt, M. and Ringle, C. M. (2019a). When to use and how to report the results of PLS-SEM. *European business review, 31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Castillo Apraiz, J., Cepeda Carrión, G. and Roldán, J. L. (2019b). *Manual de partial least squares structural equation modeling (PLS-SEM)* (2da. ed.). OmniaScience.

Hartmann, P. Apaolaza-Ibáñez, V. (2012). Consumer attitude and purchase intention toward green energy brands: The roles of psychological benefits and environmental concern. *Journal of Business Research, 65*(9), 1254-1263. https://doi.org/10.1016/j.jbusres.2011.11.001

Henseler, J., Ringle, C. M. and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science, 43*, 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hossain, M. M. (2022). Green products purchase decision during COVID-19 pandemic: an emerging market perspective. *International Journal of Education and Social Science, 9*(1), 2415-1246.

Joung, H. M. (2014). Fast-fashion consumers' post-purchase behaviours. *International Journal of Retail & Distribution Management, 42*(8), 688-697. https://doi.org/10.1108/IJRDM-03-2013-0055

Jung, S. (2014). *Slow fashion: Understanding potential consumers and creating customer value for increasing purchase intention and willingness to pay a price premium*. [Doctoral Thesis of The University of North Carolina at Greensboro]. 3637547. https://bit.ly/3wuz0S0

Kautish, P., Guru, S. and Sinha, A. (2022). Values, satisfaction and intentions: online innovation perspective for fashion apparels. *International Journal of Innovation Science, 14*(3/4), 608-629. https://doi.org/10.1108/IJIS-10-2020-0178

Kock, N. (2015). Common Method Bias in PLS-SEM: A Full Collinearity Assessment Approach. *International Journal of e-Collaboration (IJeC), 11*(4), 1-10. https://doi.org/10.4018/ijec.2015100101

Kock, F., Berbekova, A. and Assaf, A. G. (2021). Understanding and managing the threat of common method bias: Detection, prevention and control. *Tourism Management, 86*, 104330. https://doi.org/10.1016/j.tourman.2021.104330

Kumar, S., Dhir, A., Talwar, S., Chakraborty, D. and Kaur, P. (2021). What drives brand love for natural products? The moderating role of household size. *Journal of Retailing and Consumer Services, 58*, 102329. https://doi.org/10.1016/j.jretconser.2020.102329

Li, M., Zhao, L. and Srinivas, S. (2023). It is about inclusion! Mining online reviews to understand the needs of adaptive clothing customers. *International Journal of Consumer Studies, 47*(3), 1157-1172. https://doi.org/10.1111/ijcs.12895

Lindner, K. T., Savolainen, H. and Schwab, S. (2021). Development of teachers' emotional adjustment performance regarding their perception of emotional experience and job satisfaction during regular school operations, the first and the second school lockdown in Austria. *Frontiers in psychology, 12*, 702606. https://doi.org/10.3389/fpsyg.2021.702606

Lu, X., Sheng, T., Zhou, X., Shen, C. and Fang, B. (2022). How does young consumers' greenwashing perception impact their green purchase intention in the fast fashion industry? An analysis from the perspective of perceived risk theory. *Sustainability, 14*(20), 13473. https://doi.org/10.3390/su142013473

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Mamakou, X. J., Zaharias, P. and Milesi, M. (2023). Measuring customer satisfaction in electronic commerce: The impact of e-service quality and user experience. *International Journal of Quality & Reliability Management*. Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IJQRM-07-2021-0215

Miao, M., Jalees, T., Zaman, S. I., Khan, S., Hanif, N. U. A. and Javed, M. K. (2022). The influence of e-customer satisfaction, e-trust and perceived value on consumer's repurchase intention in B2C e-commerce segment. *Asia Pacific Journal of Marketing and Logistics, 34*(10), 2184-2206. https://doi.org/10.1108/APJML-03-2021-0221

Michon, R., Chebat, J. C., Yu, H. and Lemarié, L. (2015). Fashion orientation, shopping mall environment, and patronage intentions: A study of female fashion shoppers. *Journal of Fashion Marketing and Management, 19*(1), 3-21. https://doi.org/10.1108/JFMM-09-2012-0055

Mofokeng, T. E. (2021). The impact of online shopping attributes on customer satisfaction and loyalty: Moderating effects of e-commerce experience. *Cogent Business & Management, 8*(1), 1968206. https://doi.org/10.1080/23311975.2021.1968206

Mustikasari, A., Krisnawati, M. and Sutrisno, E. (2021). Customer experience and repurchase intention in multi-channel: Customer satisfaction as mediating variable. *The Journal of Industrial Distribution & Business, 12*(3), 7-19. http://dx.doi.org/10.13106/jidb.2021.vol12.no3.7

Pei, X. L., Guo, J. N., Wu, T. J., Zhou, W. X. and Yeh, S. P. (2020). Does the effect of customer experience on customer satisfaction create a sustainable competitive advantage? A comparative study of different shopping situations. *Sustainability, 12*(18), 7436. https://doi.org/10.3390/su12187436

Rathinamoorthy, R. (2019). Consumer's awareness on sustainable fashion. En S. S. Muthu (ed.), *Sustainable Fashion: Consumer Awareness and Education* (pp. 1-36). Springer Singapore. https://doi.org/10.1007/978-981-13-1262-5_1

Ratnasari, R. T., Gunawan, S., Mawardi, I. and Kirana, K. C. (2021). Emotional experience on behavioral intention for halal tourism. *Journal of Islamic Marketing, 12*(4), 864-881. https://doi.org/10.1108/JIMA-12-2019-0256

Rita, P., Oliveira, T. and Farisa, A. (2019). The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon, 5*(10), e02690. https://doi.org/10.1016/j.heliyon.2019.e02690

Santos Saraiva, M.I. (2023). *Slow fashion in Portugal: An exploratory approach*. [Dissertações de Mestrado em Gestão da Informação] (Information Management). Universidade Nova. https://bit.ly/3wgZfLH

Şener, T., Bişkin, F. and Dündar, N. (2022). The effects of perceived value, environmental concern and attitude on recycled fashion consumption. *Journal of Fashion Marketing and Management: An International Journal, 27*(4), 595-611. https://doi.org/10.1108/JFMM-01-2021-0003

Silva, J., Sá, E. S., Escadas, M. and Carvalho, J. (2021). The influence of ambient scent on the passengers' experience, emotions and behavioral intentions: An experimental study in a Public Bus service. *Transport Policy, 106*, 88-98. https://doi.org/10.1016/j.tranpol.2021.03.022

Tokar, T., Jensen, R. and Williams, B. D. (2021). A guide to the seen costs and unseen benefits of e-commerce. *Business Horizons, 64*(3), 323-332. https://doi.org/10.1016/j.bushor.2021.01.002

Trivedi, S. K. and Yadav, M. (2020). Repurchase intentions in Y generation: mediation of trust and e-satisfaction. *Marketing Intelligence & Planning, 38*(4), 401-415. https://doi.org/10.1108/MIP-02-2019-0072

Tsai, F. M. and Bui, T. D. (2021). Impact of word of mouth via social media on consumer intention to purchase cruise travel products. *Maritime Policy & Management, 48*(2), 167-183. https://doi.org/10.1080/03088839.2020.1735655

Vasić, N., Kilibarda, M. and Kaurin, T. (2019). The Influence of Online Shopping Determinants on Customer Satisfaction in the Serbian Market. *Journal of theoretical and applied electronic commerce research, 14*, 70-89. http://dx.doi.org/10.4067/S0718-18762019000200107

Wang, H., Liu, H., Kim, S. J. and Kim, K. H. (2019). Sustainable fashion index model and its implication. *Journal of Business Research, 99* (December 2017), 430-437. https://doi.org/10.1016/j.jbusres.2017.12.027

Xiaohong, M. (2019). A Study on the driving factors of rural tourists' environmental responsibility behavior. *7th International Education, Economics, Social Science, Arts, Sports and Management Engineering Conference (IEESASM 2019)*. https://bit.ly/3OIJqE0

Xu, J., Zhou, Y., Jiang, L. and Shen, L. (2022). Exploring sustainable fashion consumption behavior in the post-pandemic era: changes in the antecedents of second-hand clothing-sharing in China. *Sustainability, 14*(15), 9566. https://doi.org/10.3390/su14159566

Yeh, C. H., Lin, H. H., Gau, Y. L. and Wang, Y. S. (2022). What drives customers' purchase behavior in a click-and-mortar retailing context: a value transfer perspective. *Journal of Enterprise Information Management, 35*(6), 1658-1677. https://doi.org/10.1108/JEIM-10-2019-0344

Yin, W. and Xu, B. (2021). Effect of online shopping experience on customer loyalty in apparel business-to-consumer e commerce. *Textile Research Journal*, *91*(23-24), 2882-2895. https://doi.org/10.1177/00405175211016559

Yoon, N., Lee, H. K. and Choo, H. J. (2020). Fast fashion avoidance beliefs and anti-consumption behaviors: The cases of Korea and Spain. *Sustainability, 12*(17), 6907. https://doi.org/10.3390/su12176907

Zameer, H. and Yasmeen, H. (2022). Green innovation and environmental awareness driven green purchase intentions. *Marketing Intelligence & Planning*, *40*(5), 624-638. https://doi.org/10.1108/MIP-12-2021-0457

Zarantonello, L. and Schmitt, B. (2010) Using the brand experience scale to profile consumers and predict consumer behaviour. *J Brand Manag*, *17*, 532-540. https://doi.org/10.1057/bm.2010.4

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.51-66
https://doi.org/10.17163/ret.n27.2024.04

Factors influencing sustainable consumption behaviour in generation Z

Factores que influyen en el comportamiento de consumo sostenible en la generación Z

Gerson Jaquin Cristancho-Triana
Professor at Universidad ECCI, Colombia
gcristanchot@ecci.edu.co
https://orcid.org/0000-0002-2009-6893

Yezid Alfonso Cancino-Gómez
Professor at Universidad ECCI, Colombia
ycancino@ecci.edu.co
https://orcid.org/0000-0002-1961-9052

Fabian Arley Ninco-Hernández
Professor at Universidad Militar Nueva Granada, Colombia
fabian.ninco@unimilitar.edu.co
https://orcid.org/0000-0002-3898-6034

Received on: 15/06/23 **Revised on**: 08/07/23 **Approved** on: 04/08/23 **Published** on: 01/04/24

Abstract: this research analyzes the relationship between sustainable consumption behavior with perception, practices and perceived attributes in products and manufacturers around responsible consumption in generation Z. For this a descriptive study was made, quantitatively. A digital survey was carried out on 903 adults born in Bogotá since 1995. The statistical analysis was performed using a confirmatory factor analysis to identify if the variables are grouped in the proposed constructs, followed by a causal model based on an analysis of structural equations, with the bootstraping methodology in order to validate the proposed hypotheses. The results prove the existence of the proposed factors and it was identified that responsible consumption habits, attitude towards responsible consumption and product attributes affect sustainable consumption behavior, However, the perceived attributes of the manufacturer do not have a direct relationship with it, although when the attributes of the manufacturer are mediated by the attributes of the product there is incidence. These findings contribute to scientific knowledge since the current literature has not analyzed the relationship between the manufacturer with responsible production and the attributes of responsible consumer products perceived by the consumer. For this reason, manufacturers must improve their efforts to communicate and bring environmentally friendly products to market.

Keywords: consumer attitudes, consumption, consumer behaviour, generation Z, responsible consumption.

Resumen: esta investigación analiza la relación entre comportamiento de consumo sostenible con la percepción, las prácticas y los atributos percibidos en los productos y los fabricantes en torno al consumo responsable en la generación Z. Para esto se hizo un estudio descriptivo, con enfoque cuantitativo. Se aplicó una encuesta en formato digital a 903 adultos nacidos a partir de 1995 en la ciudad de Bogotá. El análisis estadístico se realizó mediante un análisis factorial confirmatorio para identificar si las variables se agrupan en los constructos propuestos, seguido se realizó un modelo causal a partir de un análisis de ecuaciones estructurales, con la metodología de *bootstraping* con el fin de validar las hipótesis propuestas. Los resultados comprueban la existencia de los factores propuestos y se identificó que los hábitos de consumo responsable, la actitud hacia el consumo responsable y los atributos del producto inciden en el comportamiento de consumo sostenible, sin embargo, los atributos percibidos del fabricante no tienen una relación directa con este, aunque cuando los atributos del fabricante son mediados por los atributos del producto existe incidencia. Estos hallazgos aportan al conocimiento científico ya que la literatura actual no ha analizado la relación entre el fabricante con producción responsable y los atributos de productos de consumo responsable percibidos por el consumidor. Por tal razón, los fabricantes deben mejorar sus esfuerzos en comunicar y llevar al mercado productos amigables con el medio ambiente.

Palabras clave: actitudes del consumidor, consumo, comportamiento del consumidor, generación Z, consumo responsable.

Suggested citation: Cristancho-Triana, G. J., Cancino-Gómez, Y. A. and Ninco-Hernández, F. A. (2024). Factors influencing sustainable consumption behaviour in generation Z. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 51-66. https://doi.org/10.17163/ret.n27.2024.04

Introduction

Responsible consumption is currently one of the most important aspects in environmental public policies in nations, which implies a commitment by companies and brands to provide products and services with both social and environmental responsibility, especially for younger generations, since this effect will be relevant in current and future consumption (Stănescu, 2018). Therefore, the relationships between the attributes perceived by consumers towards manufacturers and their products and services can be a trigger to activate consumption with environmental responsibility from a critical stance on excessive consumption by modifying their lifestyle from home, depending on the protection of the planet for themselves and future generations (Han and Stoel, 2017; Hosany *et al*., 2022).

The appropriation of the consumer to the social and environmental care of the planet generates important changes in the attitudes of new consumers of products and services (Hosany *et al*., 2022), among which the generation Z stands out, who according to Sharma (2019) have adopted new purchasing methods or present changes in consumption due to the awareness of the excessive consumption. This generation corresponds to those born between 1995 and 2010, who represent a critical generation with society (Arango *et al*., 2019), since their main manifestation mechanism has been the use of social networks (Jiménez *et al*., 2019), they are consumers committed to social and environmental causes recognizing problems such as climate change, little understanding in the final disposal of waste and little culture in the recycling process, so these consumers dynamize the economic sector with a broad perspective on responsible consumption (Su *et al*., 2019; Thompson and Kumar, 2018).

This generation relates responsible consumption from the degree of innovation, technology and sustainability (Arango *et al*., 2019) and their attitudes are associated with responsible consumption practices motivated by social, economic or environmental problems, being focused on the generation of a supportive behavior by each individual with society (Thompson and Kumar, 2018), so their perception highlights the eco-environmental sense in most of their daily actions, and at the same time critical against the actions of organizations, which facilitates their position both to support and affect the reputation of brands (Dragolea *et al*., 2023; Madrigal *et al*., 202 1).

Previous studies on environmentally responsible behavior have developed a basic theory on the factors that involve this behavior such as attitudes, knowledge, willingness and the ability to act (Mason *et al*., 2022), as well as studies from the ethical perception of the consumer and its relationship with the purchase intention, where the ethics of consumption is related, based on the relationships between the perception of the attributes of a product and the effect of the corporate or manufacturer brand and the product itself and the purchase (Jham and Malhotra, 2019), hence this type of research becomes a relevant input in the scientific knowledge about the behavior in responsible consumption from the perception of the attributes of both products and brands.

Therefore, this research aims to analyze the relationship between the behavior of sustainable consumption with the attitude, practices and attributes perceived in products and manufacturers around responsible consumption in generation Z living in Bogotá, since this type of studies are relevant for analyzing the consumer in terms of their tastes and preferences, and it allows to understand how this trend is immersed in the development of adequate consumption practices from home in generation Z (Stănescu, 2018; Robinson and Schänzel, 2019; Sharma, 2019). This work is divided into five sections: the first makes a review of the literature to analyze the variables in reference to the proposed model and as a basis for the hypotheses proposed; followed by the methodology used, the results obtained based on the statistical analysis, the discussion and the conclusions.

Attitude towards responsible consumption

Attitude is a construct that has been studied in different consumer contexts and is defined as a willingness or value judgment grounded by the belief system and social context (Ajzen,

print ISSN: 1390-6291; electronic ISSN: 1390-8618

1991). Beliefs are supported by perceptions, which are understood as the interpretation process of stimuli that generates a mental impression and turns out to be more influential in behavior than knowledge of objective reality (Shiffman *et al*., 2010). Responsible consumption has managed to establish levels of commitment to environmental care in society, and they are categorized according to the capacity for acceptance and responsible participation in the national and international market (Auer, 2018). As a result, concepts such as sustainable development have played an important role in the changes of perspective of each of the consumers worldwide, achieving that increasingly critical positions are established and adjusted to the current reality of the planet, especially in the social, economic and environmental contexts (Acuña and Severino, 2018).

Therefore, the attitude in the responsible consumer is related to the ability to be aware in their purchasing acts, as well as the degree of concern against negative actions during the process of manufacturing, distribution and marketing of products (Pawaskar *et al*., 2018) as a response to training in social consciousness, where the cultural and social context, which is based on the eco-friendly value system and beliefs, evokes habits and practices supported by value judgments with a high sense of ethics and morality (Contreras and Pulache, 2017; Dragolea *et al*., 2023; Severino *et al*., 2022; Wakeman *et al*., 2021). The perception of the consumer towards a responsible transition of consumption is posed according to the construction of meanings and mental models that act as adjusted representations of reality and become the behavioral basis for purchasing decisions (Krüger and Strüver, 2018). Based on the above, the following hypothesis is proposed:

> H1: Attitude towards responsible consumption has a positive mediating effect on activities in responsible consumption.

Since the 20th century, the growth of environmental awareness has been evident, where the attitude remains a pre-requisite of intention and responsible behavior (Wang *et al*., 2021), given that the attitude in the consumer is supported by beliefs, which translate into the benefits and experiences that validate the purchasing behaviors adopted in terms of satisfaction (Nacipucha and Andrade, 2018). Hence, the sense of protection towards the environment determines responsible behavior (Chwialkowska *et al*., 2020), however, a gap has been observed between attitude and intention (Bernardes *et al*., 2018; Park and Lin, 2020; Wang *et al*., 2021) in both purchasing and responsible consumption behavior, which shows that not necessarily greater environmental awareness translates into responsible behavior. This gap can be explained by the fact that the attitude towards responsible consumption is indirectly affected by personal reasons (Wang *et al*., 2021) such as the perception that a responsible behavior assumed by a subject actually generates an environmental or social benefit, motivating the action (Zheng *et al*., 2020). Based on the above, the following hypothesis is proposed:

> H2: Attitude towards responsible consumption has a positive mediating effect on responsible purchasing behavior.

Responsible consumption activities

The consumer associates their purchasing attitudes with their beliefs and values, so it is one of the aspects that most contributes to the capacity of generating environmental awareness with regard to economic well-being, emotional support, lifestyle and social processes (Song and Kim, 2018). In such a way that social groups allow comparing the values acquired in their family, which allow to modify their perspective regarding the socialization of the members, the norms of behavior imposed in each society and the formation of own concepts generated from experiences (Ali and Mandurah, 2016). It involves the activities that he/she understands and contributes to the environment for what he/she consumes and avoids consuming (Robinson and Schänzel, 2019). Based on the above, the hypothesis is:

> H3: Responsible consumption activities have a positive mediating effect on responsible purchasing behavior.

Attributes perceived towards the manufacturer in responsible consumption

Responsible consumers prioritize aspects such as: the responsibility of companies with the well-being of the community, respect for work practices, business ethics, the environmental impact generated by each organization and the additional contribution of each company to compensate the use of natural resources with their work (Ertz *et al*., 2018; García-Salirrosas, 2023). In this sense, the responsible consumer analyzes various social and environmental elements from the product or service that he/she wishes to acquire such as its manufacturing process (Groening *et al*., 2018), the working conditions of the production company, respect for human rights, the experimental use of animals and the contributions offered to society (Acuña and Severino, 2018).

Berger and Corbin (1992) propose that consumer perceived effectiveness (CPE) is the perception of the effect of a specific behavior respect to a personal concern related to the environment when thinking to have control or the ability to solve the environmental problem (Dermody *et al*., 2018; Park and Lin, 2020), which operates in a similar way to an individual assessment of the effect that would act in one way or another in front of an environmental contextual problem. CPE is considered a key factor in young consumers and it determines the sustainable purchasing decision (Joshi and Rahman, 2019) and predicts the pro-environmental behavior that positively affects, non-directly, the behavior purchase (Dermody *et al*., 2018). Thus, without an adequate CPE the involvement of the subject is not obtained (Schlaile *et al*., 2018), so the CPE relates to the perceptions held against the product and the manufacturer in the pro-environmental context. In this way, with the above, the following hypotheses are proposed:

> H4: Attitude towards responsible consumption has a positive mediating effect on manufacturer attributes perceived in the context of responsible consumption.
>
> H5: Manufacturer attributes perceived in the context of responsible consumption have a positive mediating effect on purchasing behavior

Studies such as those proposed by Hatch and Schultz (2010) and Jham and Malhotra (2019) emphasize that the perception of brand ethics is the result of the manufacturer's actions in production processes and their impact on the environment, thus generating a brand reputation effect, associated with perceived attributes that generate a socially responsible imaginary, so it generates credibility on the manufacturer. In this sense, Mason *et al*. (2022) infer that socially responsible behavior is directly linked to avoiding consuming products whose manufacturers do not offer a clear pro-environmental action, so that the belief system generated by the manufacturer becomes a relevant input to the model proposed in this study. Therefore, considering the above, the following hypothesis is proposed:

> H6: Perceived manufacturer attributes have a positive mediating effect on perceived product attributes in the context of responsible consumption.

Attributes received on the product in responsible consumption

Some studies have addressed the effect of pro-environmental perceptions on products (Jain *et al*., 2022), and although much of the current research regarding responsible purchasing behavior has already been supported by attitude through the Theory of Planned Behavior (Carfora *et al*., 2019; Choi and Johnson, 2019; Cristancho, 2023; Jain, 2019; Kumar *et al*., 2021; Prendergast and Tsang, 2019; Roos and Hahn, 2019; Setyawan *et al*., 2018; Si *et al*., 2020; Taufique & Vaithianathan, 2018; Yuriev *et al*., 2020), and in reasoned action theory (Chang & Watchravesringkan, 2018; Cheah *et al*., 2021; Minton *et al*., 2018; Nguyen *et al*., 2019; Paço *et al*., 2019; Rausch & Kopplin, 2021); in both operates the social influence and attitudes as predictors intention and subsequent behavior; these being the most relevant when the belief system is directly related to the characteristics of the product. Thus, in sustainable consumption behavior (Geiger *et al*., 2018, Jiang and Pu, 2022; Kreuzer *et*

print ISSN: 1390-6291; electronic ISSN: 1390-8618

al., 2019; Marzouk *et al*., 2020; Piligrimienė *et al*., 2020) it is based on purchasing, use and disposal behavior in specific categories in the ecological and socio-economic dimensions. In this way, with the above, the following hypothesis is proposed:

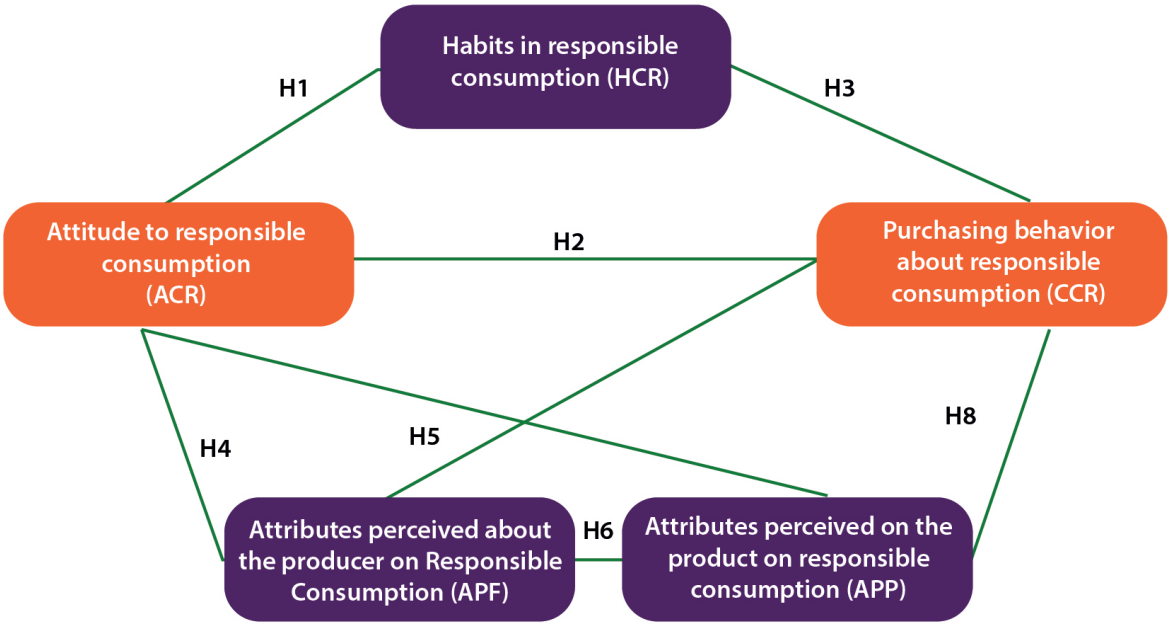
> H7: Attitude towards responsible consumption has a positive mediating effect on product attributes perceived in the context of responsible consumption.

Hatch and Schultz (2010) and Jham and Malhotra (2019) establish that the attributes perceived by products directly influence responsible consumption, these aspects being associated with ingredients or raw materials, manufacturing processes, marketing and disposal in the context of environmental impact. This is also addressed by Mason *et al*. (2022) who propose that responsible behavior involves doing recycling actions and avoiding the consumption of products from manufacturers that do not perform corporate social responsibility actions, as well as avoiding the purchase and consumption of products that have a high environmental impact (Jia *et al*., 2023). In view of the above, the following scenario is proposed:

> H8: Perceived product attributes have a positive mediating effect on responsible purchasing behavior

According to the literature review, Figure 1 shows the proposed model.

Figure 1
Proposed model



Materials and method

This descriptive, transversal, non-experimental research aims to analyze the relationship between sustainable consumption behavior with the perception, practices and attributes perceived in products and manufacturers around responsible consumption. Men and women of the city of Bogota were used as reference, adults born between 1995 and 2003, which correspond to adult population belonging to generation Z. According to the National Department of Statistics (DANE) in Bogota, this population corresponds to 1 274 714 men and women; for this the sample was estimated taking as a criterion a confidence level of 95%,

a margin of error of 5%, obtaining a total sample of 385, however, 903 surveys were obtained.

As a collection instrument, a questionnaire designed in the Google forms platform was used, composed of two parts, the first focused on characterizing the participating population, the second focused on assessing responsible consumption with 30 reagents which were valued with a Likert-type response of 5 points (1=Totally disagree, 5=Totally disagree), to determine the attitude towards responsible consumption (ACR), the activities or habits related to responsible consumption (HCR), the attributes perceived towards the manufacturer in responsible consumption (APF), the attributes perceived in the product in responsible consumption (APP), and finally the behavior of buying in responsible consumption (CCR). The table shows the variables under study and the authors on which the reagents were created.

Table 1

Dimensions associated with responsible consumption purchasing perceptions

Dimension	Variable	Authors
Attitude about responsible consumption (ACR)	I believe that environmental preservation relates to responsible consumption	Dragolea *et al*. (2023); Quoquab *et al*. (2019).
	I believe on saving natural and monetary resources	
	I believe that appropriate use should be made of materials and resources	
	I believe that products should have a longer shelf life	
	I have environmental awareness whenever I consume products	
	I try to consume environmentally friendly products	
	I try to buy only the products I need	
	I consider buying reusable bags	
	I have environmental awareness whenever I buy products	
	I try to be aware of the proper disposition of materials I discard	
	I try to buy products with minimal carbon footprint	
Attributes perceived on the product in Responsible Consumption (APP)	The product indicates how to recycle	Jham & Malhotra (2019); Nittala (2014); Song *et al*. (2019).
	The product indicates how its final disposition should be	
	The product indicates its environmental impact	
	The product indicates its social impact on sales and consumption	
	The product indicates the form of reuse	
	The product indicates whether animal testing was carried out during the manufacturing process	
Habits of Responsible Consumption (HCR)	Reused the glass containers	Mason *et al*. (2022); Ali and Mandurah (2016), Stănescu (2018), Robinson and Schänzel (2019).
	Reused plastic containers	
	I recycle in my home	
	Buy reusable products	
	I reduce the use of appliances and turn them off when I do not use them	
	I buy products packed in glass	

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Dimension	Variable	Authors
Attributes received on the manufacturer in Responsible Consumption (APF)	Manufacturer indicates whether it uses environmentally friendly manufacturing materials	Pokholkov & Zaitseva (2017); Ertz *et al.* (2018).
	Manufacturer indicates whether it uses environmentally friendly packaging material	
	Manufacturer indicates whether it uses a clean production process	
	The manufacturer indicates the origin or place of origin of the product	
Purchasing behavior on Responsible Consumption (CCR)	I only buy the products I need and will actually use	Dragolea *et al.* (2023); Quoquab *et al.* (2019) and Severino-González *et al.* (2022).
	I take my own reusable bag to the supermarket	
	I buy biodegradable and/or organic products	

For data analysis, SPSS v26 and AMOS v24 software were used. An exploratory factor analysis (EFA) was done in the first instance in order to verify the grouping of the reagents against each proposed factor in a preliminary way, as well as to identify variables with factor loads below 0.7 and define whether these will be part of the study. Then, a confirmatory factor analysis (CFA) was conducted to validate the proposed questionnaire, considering the variables with satisfactory results of the EFA. Finally, an analysis of structural equations in the AMOS program was conducted, which takes as reference the analysis of covariances, which implies maximum likelihood seeking to minimize the difference between the observed and estimated covariance matrices, additionally it allows to explain the mediation of the variables in both direct and indirect effects (Hair *et al.*, 2014). It is worth clarifying that there are other methodologies of analysis of structural equations that use the least squares method which offer versatility in the results of exploratory studies (Soriano and Mejía-Trejo, 2022).

The causal model was tested with the bootstraping methodology, which is a resampling technique that allows to extract subsamples randomly from the original sample, which in turn estimates models in each subsample (Efron and Tibshirani, 1993) without depending on the type of distribution. As the proposed model has hypotheses associated with indirect effects, this technique allows to validate the hypotheses proposed from a theoretical model (Ledesma, 2008); 5000 subsamples were taken as reference in order to have more reliable results since measurements higher than this would not yield significant advantages, and in terms of the percentile level of the confidence intervals it was estimated over 90%, and was corrected to 95% in order to mitigate the inflation effect of the data generated by the technique.

Results and discussion

The study sample is characterized mainly by being mostly female (n=512, 56.7 %) than male (n=391; 43.3 %), with a low socioeconomic level (n=368; 40.8 %) and medium (n=518; 57.4 %); with a level of professional education (n=661; 73.2 %) and high school education (n=242; 26.8 %).

For validating the dimensions of analysis, an EFA was developed with the maximum likelihood extraction method and with Varimax rotation, however, it was observed that there were variables with factorial load less than 0.7 so 15 variables were eliminated from the study. The results obtained were satisfactory both in the KMO test (0.904) as well as significance in the Barlett sphericity test ($p<0.001$); the model converged on five factors, explaining 51.95% of the variance. With these results, the AFC was developed, where the maximum likelihood method was used for estimating the goodness of fit parameters, obtaining a value for the acceptable square Chi ($x^2=325.69$; $p<0.001$; gl=125). Table 2 shows that all reagents obtained factor loads higher than 0.7 and Cronbach's Alpha obtained results higher than 0.7 in each factor.

Table 2
Reliability and internal consistency

Factor	Variable	Factor Load	Alpha de Cronbach
Attitude towards responsible consumption (ACR)	ACR1	0.841	0.903
	ACR2	0.766	
	ACR3	0.790	
	ACR4	0.737	
	ACR5	0.722	
	ACR6	0.723	
	ACR7	0.713	
Attributes perceived on the product in responsible consumption (APP)	APP1	0.902	0.843
	APP2	0.809	
	APP3	0.710	
Habits towards responsible consumption (HCR)	HCR1	0.795	0.759
	HCR2	0.800	
	HCR3	0.719	
Attributes perceived on the manufacturer in responsible consumption (APF)	APF2	0.709	0.732
	APF 3	0.782	
	APF 4	0.712	
Responsible Purchasing Behavior (CCR)	CCR4	0.738	0.775
	CCR5	0.856	

Table 3 shows the results of the convergent validity, where it is shown that the composite reliability index (CR) obtained results greater than 0.7 (Hu and Bentler, 1999) and the extracted average variance (AVE) values greater than 0.5 (Fornell and Larcker, 1981) less for APF, additionally it meets the criterion of the Heterotrait-Monotrait Ratio of Correlations (HTMT) obtaining values less than 0.9 in such a way that the discriminant validity is met (Henseler *et al*., 2015). In the case of discriminant validity, it is observed that the correlations between constructs are lower than the value of the square root of the AVE, thus fulfilling the criterion of Fornell and Larcker (1981).

Table 3
Convergent and discriminatory validity

	CR	AVE	MSV	HCR	PCR	APF	CPC	APP
HCR	0.77	0.532	0.077	0.729				
ACR	0.904	0.573	0.085	0.092*	0.757			
APF	0.739	0.488	0.327	-0.021	0.192***	0.699		
CPC	0.779	0.639	0.126	0.277***	0.291***	0.251***	0.799	
APP	0.851	0.658	0.327	0.151***	0.264***	0.571***	0.354***	0.811

Note. ***=p<0.001

print ISSN: 1390-6291; electronic ISSN: 1390-8618

From the bootstraping technique with a sampling of 5000 subsamples the causal relationships raised in the hypotheses are evaluated. The model obtained an R^2 for responsible purchasing behavior of 0.214, for attributes perceived towards the product in responsible consumption 0.351, attributes perceived from the manufacturer 0.037 and for responsible consumption activities 0.009. The goodness of fit indices of the model (X^2=343.51; gl=127; p<0.001), achieved satisfactory results in all CMIN/DF=2.855, CFI=.965, NFI=.948, TLI=.959, RMR.=.051, PNFI=.799, PCFI=.814, RMSEA=.045, Pclose=.918, according to the criteria of Hu and Bentler (1999).

Table 4 presents the results for each hypothesis where it can be observed that there is significant influence between ACR and HCR (β=0.093; P<0.05), the same happens between HCR and CCR (β=0.174; P<0.001), so that there is an indirect effect between perceptions and purchasing behavior, since the direct effect between these variables is significant (β=0.14; P<0.001). On the other hand, it is observed that there is significant influence between the ACR and APP (β=0.136; P<0.001), as well as between the APPCR and CPCR (β=0.29; P<0.001), and it is evident that there is a direct relationship. Similarly, it is observed that there is a positive influence between the ACR and APF (β=0.24; P<0.05) and the APF and APP, so that aspects related to products and manufacturers significantly influence the purchase of products with a responsible consumption approach. However, it was found that there is no significant influence between APF and CCR (β=0.20; P<0.001).

Table 4

Hypothesis test result

	Hypothesis		Path coefficient	H.E.	C.R.	P value	Comment
H1	ACR →	HCR	0.094	0.06	2.409	*	Accepted
H2	ACR →	CCR	0.195	0.044	4.85	***	Accepted
H3	HCR →	CCR	0.229	0.03	5.503	***	Accepted
H4	ACR →	APF	0.192	0.043	4.649	***	Accepted
H5	APF →	CCR	0.09	0.056	1.712	0.08	Rejected
H6	APF →	APP	0.541	0.059	10.877	***	Accepted
H7	ACR →	APP	0.16	0.042	4.637	***	Accepted
H8	APP →	CCR	0.224	0.406	4.31	***	Accepted

Note. *=p<0.05; **=p<0.01; ***=p<0.001

Table 5 shows the results of indirect effects, and they suggest that the level of significance in double track for standardized indirect effects in all cases was p<0.001, so the effect mediation is complete, which means that the behavior towards responsible consumption from the ACR is mediated by both HCR, APP and APF, because the direct effect between the ACR and CCR was previously identified. However, establishing the mediating effects of HCR on the CCR implies that routines and habits when appropriated by a group of consumers evoke an effect consisting of purchasing actions. Similarly, both APP and APF when perceived by the consumer are relevant in the CCR. However, it must be taken into account that the behavior towards responsible consumption from the APF is partially mediated by the APP.

Table 5
Outcome of indirect effects

Hypothesis	Direct effect	Indirect effect	Comment
ACR→ HCR → CCR	0.195***	0.098***	Complete Mediation
ACR → APF → CCR	0.195***	0.098***	Complete Mediation
ACR → APP → CCR	0.195***	0.098***	Complete Mediation
ACR → APF → APP	0.127**	0.104***	Complete Mediation
APF → APP → CCR	0.129**	0,090	Partial mediation

Note. *=p<0.05; **=p<0.01; ***=p<0.001

This research shows the positive influence that the attitude has on responsible behavior, which is mediated both by the activities or habits in responsible consumption, aspect proposed in the first hypothesis (H1), where generation Z is characterized by being more environmentally perceptive by individuals and therefore adopts responsible consumption habits, where the attitude drives the action of younger consumers towards sustainability given the relationship between their moral identity and pro-environmental behavior, aspects recognized in the present study, and that have already been identified in several previous investigations (Hosta and Zabkar, 2021; Mejía-Gil, 2018; Pérez-Martínez and Topa, 2018; White *et al*., 2019; Wu and Yang, 2018).

As for H2, it is observed that there is a positive mediating effect between the ACR and the CCR, an aspect that has been mentioned in previous research, where it is verified that purchasing behavior and positive attitudes towards responsible products are related to each other (Jaiswal and Sigh, 2018; Nguyen *et al*., 2019), being consistent with the previous premise that the attitude triggers intention (Ajzen, 1991; Wang *et al*., 2021). In that sense, the third hypothesis (H3), shows that there is a positive mediating effect between the HCR and the CCR, an aspect that has also been identified in the studies developed by Prendergast and Tsang (2019) and López and Peñalosa (2021) where it is established that young consumers are increasing their social awareness, through their actions and therefore when they make their purchasing decisions. Thus, a strong relationship between positive attitudes and the purchase of socially responsible products is identified, so the relationship of the indirect effect between the ACR mediated by the HCR to the CCR proposed in this research is coherent.

On the other hand, the relationship between the ACR and the APF (H4), emphasizes the presence of responsible activities, the origin or environmental impact of the manufacturer, so the ACR is a significant predictor of the intention to buy products derived from companies based on their performance in Corporate Social Responsibility (CSR), aspects that have also been identified in the investigations proposed by Prendergast and Tsang (2019), so that there is a relationship between ethical attributes of the consumer and ethical purchasing (Jham and Malhotra, 2018). However, in this study it was observed that APFs do not affect the CCR (H5). However, the results of indirect effects suggest that socially responsible behavior actions do influence to some degree the purchase of products from companies with good social or environmental behavior, since they are more willing to pay an overprice on products whose manufacturer promotes social causes, an aspect that can contrast with purchase decisions oriented on price conditions and the confidence or reputation of a manufacturer brand on its product portfolio. These aspects were identified in this study and have also been reviewed with similar results in different investigations (Amezcua *et al*., 2018; Araya and Rojas, 2020; Del Giudice *et al*., 018; Liu and Xu, 2023; Palacios-González and Chamorro-Mera, 2020).

Although sustainable consumption and production play an essential role in promoting sustainable development (Wang *et al*., 2019) and therefore constitute a topic of growing interest (Wang *et al*., 2019), as methods of assortment and production planning take into account the envi-

print ISSN: 1390-6291; electronic ISSN: 1390-8618

ronmental concerns of the consumer as a planning factor (Umpfenbach *et al*., 2018), the link that the consumer makes between a manufacturer with responsible production and the attributes of responsible consumer products (H6) is not evident in the current literature, constituting this perception a novelty in relation to the factors associated with responsible purchasing behavior.

This research highlights the positive mediating effect between ACR and APF (H7), as also evidenced in the study developed by Lawley *et al*. (2019) where consumers concerned about effects on the health and sustainability of the products they consume give more importance to the characteristics of the products. A positive effect of ecological literacy and self-efficacy in the attitude towards organic products has also been observed (Al Mamun *et al*., 2018), so that the relationship proposed by Jham and Malhotra (2019) and Mason *et al*. (2022) against the incidence of ACR against the APP is evident in the present study.

In addition, studies such as those proposed by Grazzini *et al*. (2021) and Trudel (2019) have addressed the direct relationship between the APP and the CCR (H8), as identified by this research. However, these preferences for sustainable products and their attributes depend on how these considerations of choice are formed by the consumer; and although the research proposed by Coşkun *et al*. (2022) establish that consumers have a positive attitude to responsible products, this research reports results where such a relationship is present and that the effect mediated from the ACR through the APP does have an effect on the CCR.

The model proposed in this research centrally locates the perception of generation Z regarding responsible consumption and responsible purchasing behavior, while showing that factors such as responsible consumption activities, attributes of responsible consumption products and attributes of responsible manufacturer moderate responsible purchasing behavior. Recognizing that socially responsible behavior has a multidimensional character (Palacios-González and Chamorro-Mera, 2020), the study of perceptions and responsible consumption activities against such behavior should be considered.

Conclusions

This article analyzed the influence on responsible consumption behavior in factors such as responsible practices at the home, related with beliefs, perception towards the product and responsible consumption, finding that the proposed model describes the activities in terms of recycling, reusing materials and buying reusable products; and its impact on the environment as if it is biodegradable or ecological, as well as the separation for its final disposal and use of reusable bags substitutes for plastic bags. Perceptions that affect responsible purchasing are divided between the product and the manufacturer. From a product perspective, buyers consider attributes such as recycling once used, how to dispose it, and the possibility of reuse. From the manufacturer's perspective, the considerations of generation Z are oriented to concerns related to the manufacturing material, the origin of the product and the clean production related with the environmental impact.

Generation Z has developed an environmental awareness that seeks to limit consumerism. For them, responsible consumption is related to environmental impact, which is linked to friendly products, the use and proper use of resources, environmental preservation, the shelf life of products, and zero carbon footprints. This determines that the most representative behaviors and perceptions of the responsible behavior of generation Z focus on three fundamental elements: reuse, recycling and final disposal. This is how this generation recognizes current problems and has formed an environmental awareness that demands products and production processes consistent with their way of thinking.

Therefore, the corporate social responsibility actions of the manufacturer brand are transferred to their products, and have an impact on the perception of consumers with pro-environmental practices, an aspect that affects their purchasing behavior. Therefore, it is important to mention that the manufacturer must provide consistency in its activities to the benefit of the environment and at the same time generate credibility on the effectiveness of such actions.

Whenever society makes efforts to reduce pollution, reduce waste, produce with less impact, rationalization in the use of natural resources, as well as the development of a legal framework that promotes a change of our current consumption practices, they can only be served to the extent that marketing activities focus on an emerging responsible consumer that in the near future will constitute a relevant segment of the market, as is the generation Z. For future research, it is pertinent to replicate the model proposed in millennial and X generations, in order to verify whether the results are significantly similar and whether the variables proposed in the resulting model also exert influence on responsible behavior and whether this effect is also observe in other cultural contexts, as well as to develop studies that demonstrate the intention to purchase environmentally friendly products and derivatives of recycling.

Research support and financial support

Entity: Universidad ECCI

Country: Colombia

City: Bogota

Subsidized project: "The perceptions, motivations and attitudes of the Colombian consumer towards the consumption of products and services in different contexts as an effect of the Covid-19 pandemic".

Project Code: PIDI 09 2022

References

Acuña, O. and Severino, P. (2018). Sustentabilidad y comportamiento del consumidor socialmente responsable. *Opción, 34* (87), 299-324. https://bit.ly/3I5FrxB

Al Mamun, A., Mohamad, M. R., Yaacob, M. R. B. and Mohiuddin, M. (2018). Intention and behavior towards green consumption among low-income households. *Journal of environmental management, 227*, 73-86. https://doi.org/10.1016/j.jenvman.2018.08.061

Ali, I. and Mandurah, S. (2016). The role of personal values and perceived social support in developing socially responsible consumer behavior. *Asian Social Science, 12*(10), 180-189. http://dx.doi.org/10.5539/ass.v12n10p180

Amezcua, B., Briseño, A., Ríos, T. and Ayala, E. (2018). La disposición a pagar más por productos vinculados a la RSE: evidencia de un análisis conjunto en México. *Contaduría y administración, 63*(2), 1-21. https://doi.org/10.22201/fca.24488410e.2018.1013

Arango, C., Camelo, C., Huertas, M., Sánchez, C., Sánchez, V. and Sojo, J. (2019). *1218 Centennials: Generación Sin Etiquetas* (1° ed.). Fundación Universidad de Bogotá Jorge Tadeo Lozano.

Araya Pizarro, S. C. and Rojas Escobar, L. E. (2020). Consumo responsable e intención de compra en sectores populares: una aproximación multivariante. *Ciencias administrativas*, (16), 12-24. http://dx.doi.org/https://doi.org/10.24215/23143738e062

Auer, B. (2018). Green, greener, greenest: Identifying ecological trends and leading entities by means of environmental ratings. *International Review of Applied Economics, 32*(2), 139-162. https://doi.org/10.1080/02692171.2017.1332015

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Berger I. E. and Corbin R.M. (1992) Perceived consumer effectiveness and faith in others as moderators of environmentally responsible behaviors. *J Public Policy Mark, 11*, 79-89. https://doi.org/10.1177/074391569201100208

Carfora, V., Cavallo, C., Caso, D., Del Giudice, T., De Devitiis, B., Viscecchia, R., Nardone, G. and Cicia, G. (2019). Explaining consumer purchase behavior for organic milk: Including trust and green self-identity within the theory of planned behavior. *Food Quality and Preference, 76*, 1-9. https://doi.org/10.1016/j.foodqual.2019.03.006

Chang, H. J. and Watchravesringkan, K. T. (2018). Who are sustainably minded apparel shoppers? An investigation to the influencing factors of sustainable apparel consumption. *International Journal of Retail and Distribution Management, 46*(2), 148-162. https://doi.org/10.1108/IJRDM-10-2016-0176

Cheah, I., Shimul, A. S., Liang, J. and Phau, I. (2020). Drivers and barriers toward reducing meat consumption. *Appetite, 149*, 104636. https://doi.org/10.1016/j.appet.2020.104636

Choi, D. and Johnson, K. K. (2019). Influences of environmental and hedonic motivations on intention to purchase green products: An extension

print ISSN: 1390-6291; electronic ISSN: 1390-8618

of the theory of planned behavior. *Sustainable Production and Consumption, 18,* 145-155. https://doi.org/10.1016/j.spc.2019.02.001

Chwialkowska, A., Bhatti, W. A. and Glowik, M. (2020). The influence of cultural values on pro-environmental behavior. *Journal of Cleaner Production, 268*, 122305. https://doi.org/10.1016/j.jclepro.2020.122305

Coşkun, A., Polonsky, M. and Vocino, A. (2022). Pro-environmental purchase intentions in a low-involvement context: the role of myopia and a*pathy. Journal of Global Responsibility, 14*(3), 310-336. https://doi.org/10.1108/JGR-04-2022-0034

Cristancho, G. J. (2023). Actitud e intención hacia el consumo responsable en los hogares de Bogotá. *Tendencias, 24*(1), 130-154. https://doi.org/10.22267/rtend.222302.218

Dragolea, L. L., Butnaru, G. I., Kot, S., Zamfir, C. G., Nuță, A. C., Nuță, F. M., Cristea, D. and Ștefănică, M. (2023). Determining factors in shaping the sustainable behavior of the generation Z consumer. *Frontiers in Environmental Science, 11,* 1096183. https://doi.org/10.3389/fenvs.2023.1096183

Del Giudice, T., Stranieri, S., Caracciolo, F., Ricci, E. C., Cembalo, L., Banterle, A. and Cicia, G. (2018). Corporate Social Responsibility certifications influence consumer preferences and seafood market price. *Journal of Cleaner Production, 178,* 526-533. https://doi.org/10.1016/j.jclepro.2017.12.276

Dermody, J., Koenig-Lewis, N., Zhao, A. L. and Hanmer-Lloyd, S. (2018). Appraising the influence of pro-environmental self-identity on sustainable consumption buying and curtailment in emerging markets: Evidence from China and Poland. *Journal of Business Research, 86,* 333-343. https://doi.org/10.1016/j.jbusres.2017.09.041

Efron, B. and Tibshirani, R. J. (1993). An introduction to the bootstrap. London, Chapman and Hall.

Ertz, M., Durif, F., Lecompte, A. and Boivin, C. (2018). Does "sharing" mean "socially responsible consuming"? Exploration of the relationship between collaborative consumption and socially responsible consumption. *Journal of Consumer Marketing, 35*(4), 392-402. https://doi.org/10.1108/JCM-09-2016-1941.

Fornell, C. and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research, 18*(1), 39-50. https://doi.org/10.1177/002224378101800104

García-Salirrosas, E. E. (2023). Impacto del clima organizacional proambiental en el compromiso y comportamiento sostenible de los trabajadores en Perú. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 205-222. https://doi.org/10.17163/ret.n26.2023.02

Grazzini, L., Acuti, D. and Aiello, G. (2021). Solving the puzzle of sustainable fashion consumption: The role of consumers' implicit attitudes and perceived warmth. *Journal of Cleaner Production, 287*, 125579. https://doi.org/10.1016/j.jclepro.2020.125579

Geiger, S. M., Fischer, D. and Schrader, U. (2018). Measuring what matters in sustainable consumption: an integrative framework for the selection of relevant behaviors. *Sustainable development, 26*(1), 18-33. https://doi.org/10.1002/sd.1688

Groening, C., Sarkis, J. and Zhu, Q. (2018). Green marketing consumer-level theory review: A compendium of applied theories and further research directions. *Journal of cleaner production, 172,* 1848-1866. https://doi.org/10.1016/j.jclepro.2017.12.002

Hamari, J., Sjöklint, M. and Ukkonen, A. (2016). The sharing economy: Why people participate in collaborative consumption. *Journal of the association for information science and technology, 67*(9), 2047-2059. https://doi.org/10.1002/asi.23552

Hair, J. F., Gabriel, M. and Patel, V. (2014). AMOS covariance-based structural equation modeling (CB-SEM): Guidelines on its application as a marketing research tool. *Brazilian Journal of Marketing, 13*(2). https://doi.org/10.5585/remark.v13i2.2718

Hatch, M. J. and Schultz, M. (2010). Toward a theory of brand cocreation with implications for brand governance. *Journal of Brand Management, 17*(8), 590-604. https://doi.org/10.1057/bm.2010.14

Henseler, J., Ringle, C. M. and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *Journal of the Academy of Marketing Science, 43*(1), 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hosany, A. S., Hosany, S. and He, H. (2022). Children sustainable behaviour: A review and research agenda. *Journal of Business Research, 147*, 236-257. https://doi.org/10.1016/j.jbusres.2022.04.008

Hosta, M. and Zabkar, V. (2021). Antecedents of environmentally and socially responsible sustainable consumer behavior. *Journal of Business Ethics, 171*(2), 273-293. https://doi.org/10.1007/s10551-019-04416-0

Hu, L. and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis:

Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Inglada, E. and Sastre, J. M. (2016). Reflexións sobre responsabilidade social empresarial, responsabilidade pública e a sustentabilidade medioambiental. *Revista Galega De Economía, 25*(3), 5-16. https://doi.org/10.15304/rge.25.3.3795

Jain, S. (2019). Factors affecting sustainable luxury purchase behavior: A conceptual framework. *Journal of International Consumer Marketing, 31*(2), 130-146. https://doi.org/10.1080/08961530.2018.1498758

Jain, V. K., Dahiya, A., Tyagi, V. and Sharma, P. (2022). Development and validation of scale to measure responsible consumption. *Asia-Pacific Journal of Business Administration, 15*(5). https://doi.org/10.1108/APJBA-12-2020-0460

Jaiswal, D. and Singh, B. (2018). Toward sustainable consumption: Investigating the determinants of green buying behaviour of Indian consumers. *Business Strategy & Development, 1*(1), 64-73. https://doi.org/10.1002/bsd2.12

Jham, V. and Malhotra, G. (2019). Relationship between ethics and buying: a study of the beauty and healthcare sector in the Middle East. *International Journal of Services Technology and Management, 25*(1), 36-52. https://doi.org/10.1504/ijstm.2019.096611

Jia, T., Iqbal, S., Ayub, A., Fatima, T. and Rasool, Z. (2023). Promoting responsible sustainable consumer behavior through sustainability marketing: the boundary effects of corporate social responsibility and brand image. *Sustainability, 15*(7), 6092. https://doi.org/10.3390/su15076092

Jiang, S. and Pu, R. (2022). An empirical investigation on sustainable consumption behaviors in the online Education industry: perspectives from Chinese college student. *International Journal of Entrepreneurship, 26,* 1-17. https://bit.ly/49nJZeM

Jiménez, S. Á., Ortega, M. F., Vayas, R. E., Martínez, B. C. and Lavín, J. M. (2019). *Generation Z versus adults in the Ecuadorian digital integration from 2015 to 2019* [Conference]. Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality, León, Espana. https://doi.org/10.1145/3362789.3362856

Joshi, Y. and Rahman, Z. (2019). Consumers' sustainable purchase behaviour: Modeling the impact of psychological factors. *Ecological economics, 159,* 235-243. https://doi.org/10.1016/j.ecolecon.2019.01.025

Kang, Y. and Park, S. (2016). The perfection of the narcissistic self: A qualitative study on luxury consumption and customer equity. *Journal of Business Research, 69*(9), 3813-3819. https://doi.org/10.1016/j.jbusres.2015.12.073

Kreuzer, C., Weber, S., Off, M., Hackenberg, T. and Birk, C. (2019). Shedding light on realized sustainable consumption behavior and perceived barriers of young adults for creating stimulating teaching-learning situations. *Sustainability, 11*(9), 2587. https://doi.org/10.3390/su11092587

Krüger, T. and Strüver, A. (2018). Narratives of "good food": Consumer identities and the appropriation of sustainability discourses. *Zeitschrift fur Wirtschaftsgeographie, 62*(3-4), 217-232. https://doi.org/10.1515/zfw-2017-0006

Kumar, A., Prakash, G. and Kumar, G. (2021). Does environmentally responsible purchase intention matter for consumers? A predictive sustainable model developed through an empirical study. *Journal of Retailing and Consumer Services, 58*, 102270. https://doi.org/10.1016/j.jretconser.2020.102270

Lawley, M., Craig, J. F., Dean, D. and Birch, D. (2019). The role of seafood sustainability knowledge in seafood purchase decisions. *British Food Journal, 121*(10), 2337-2350. https://doi.org/10.1108/BFJ-08-2018-0513

Ledesma, R. (2008). Introducción al Bootstrap. Desarrollo de un ejemplo acompañado de software de aplicación. *Tutorials in quantitative methods for psychology, 4*(2), 51-60. https://doi.org/10.20982/tqmp.04.2.p051

Liu, Y. and Xu, C. (2023). Consumer intention to purchase and corporate social responsibility: Evidence from an experiment in an entrepreneurial context. *Journal of Consumer Behaviour, 22*(4), 905-911. https://doi.org/10.1002/cb.1987

López, D. M. and Peñalosa, M. E. (2021). Relación entre la actitud ambiental y la compra de productos socialmente responsables en los consumidores de Medellín, Colombia. *Tendencias, 22*(1), 1-17. https://doi.org/10.22267/rtend.202102.152

Madrigal, F., Madrigal, S. and Bejár, V. (2021). Estrategias de marketing orientadas al consumo de la generación Centennial. (4), 268-286. https://doi.org/10.19044/esj.2021.v17n4p268

Marzouk, O. A. and Mahrous, A. A. (2020). Sustainable consumption behavior of energy and water-efficient products in a resource-constrained environment. *Journal of Global Marketing, 33*(5), 335-353. https://doi.org/10.1080/08911762.2019.1709005

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Mason, M. C., Pauluzzo, R. and Umar, R. M. (2022). Recycling habits and environmental responses to fast-fashion consumption: Enhancing the theory of planned behavior to predict Generation Y consumers' purchase decisions. *Waste Management*, *139*, 146-157. https://doi.org/10.1016/j.wasman.2021.12.01

Mejía-Gil, M. C. (2018). El consumo de productos ecológicos, el consumo responsable y la conciencia ambiental: encuentros y desencuentros. En M. A. Gómez y F. A. Narváez *Humanidades en contexto. Entornos para el cuidado de la vida* (pp. 15-40). Universidad Católica de Oriente.

Minton, E. A., Spielmann, N., Kahle, L. R. and Kim, C. H. (2018). The subjective norms of sustainable consumption: A cross-cultural exploration. *Journal of Business Research, 82*, 400-408. https://doi.org/10.1016/j.jbusres.2016.12.031

Nacipucha, N. A. S. and Andrade, N. C. R. (2018). Referenciales en la intención y decisión de compra de Smartphone en los estudiantes universitarios de Guayaquil. *INNOVA Research Journal, 3*(2.1), 103-110. https://doi.org/10.33890/innova.v3.n2.1.2018.581

Nittala, R. (2014). Green Consumer Behavior of the Educated Segment in India. *Journal of International Consumer Marketing, 26*(2), 138-152. https://doi.org/10.1080/08961530.2014.878205

Nguyen, H. V., Nguyen, C. H. and Hoang, T. T. B. (2019). Green consumption: Closing the intention-behavior gap. *Sustainable Development, 27*(1), 118-129. https://doi.org/10.1002/sd.1875

Paço, A., Shiel, C. and Alves, H. (2019). A new model for testing green consumer behaviour. *Journal of Cleaner Production, 207*, 998-1006. https://doi.org/10.1016/j.jclepro.2018.10.105

Palacios-González, M. M. and Chamorro-Mera, A. (2020). El consumo socialmente responsable: Un estudio del consumidor español. *Dos Algarves: A Multidisciplinary e-Journal*, (38), 105-121. https://doi.org/10.18089/DAMeJ.2020.38.5

Park, H. J. and Lin, L. M. (2020). Exploring attitude–behavior gap in sustainable consumption: Comparison of recycled and upcycled fashion products. *Journal of Business Research, 117*, 623-628. https://doi.org/10.1016/j.jbusres.2018.08.025

Pawaskar, U., Raut, R. and Gardas, B. (2018). Assessment of Consumer Behavior Towards Environmental Responsibility: A Structural Equations Modeling Approach. *Business Strategy and the Environment, 27*(4), 560-571. https://doi.org/10.1002/bse.2020

Pérez-Martínez, S. A. and Topa, G. (2018). Percepciones sobre la responsabilidad social corporativa de las empresas: relación con las actitudes y conductas de sus clientes. *Acción psicológica, 15*(1), 103-120.

Pickles, J., Barrientos, S. and Knorringa, P. (2016). New end markets, supermarket expansion and shifting social standards. *Environment and Planning A, 48*(7), 1284-1301. https://doi.org/10.1177/0308518X16631540

Piligrimienė, Ž., Žukauskaitė, A., Korzilius, H., Banytė, J. and Dovalienė, A. (2020). Internal and external determinants of consumer engagement in sustainable consumption. *Sustainability, 12*(4), 1349. https://doi.org/10.3390/su12041349

Prendergast, G. P. and Tsang, A. S. (2019). Explaining socially responsible consumption. *Journal of Consumer Marketing, 36*(1), 146-154. https://doi.org/10.1108/JCM-02-2018-2568

Pokholkov, Y. and Zaitseva, K. (2017). Specific learning environments for fostering students' sustainability mindset. En *45th SEFI Annual Conference 2017-Education Excellence for Sustainability, SEFI* 2017, Azores, Portugal.

Rausch, T. M. and Kopplin, C. S. (2021). Bridge the gap: Consumers' purchase intention and behavior regarding sustainable clothing. *Journal of Cleaner Production, 278*, 123882. https://doi.org/10.1016/j.jclepro.2020.123882

Robinson, V. M. and Schänzel, H. A. (2019). A tourism inflex: Generation Z travel experiences. *Journal of Tourism Futures, 5*(2), 127–141. https://doi.org/10.1108/JTF-01-2019-0014

Roos, D. and Hahn, R. (2019). Understanding collaborative consumption: An extension of the theory of planned behavior with value-based personal norms. *Journal of Business Ethics, 158*(3), 679-697. https://doi.org/10.1007/s10551-017-3675-3

Schlaile, M. P., Klein, K. and Böck, W. (2018). From bounded morality to consumer social responsibility: a transdisciplinary approach to socially responsible consumption and its obstacles. *Journal of Business Ethics, 149*(3), 561-588. https://doi.org/10.1007/s10551-016-3096-8

Severino-González, P., Sarmiento-Peralta, G., Villar-Olaeta, J. and Ramírez-Molina, R. (2022). Socially responsible sustainable consumption: the case of university students from a city in Peru. *Formación universitaria, 15*(1), 219-230. https://dx.doi.org/10.4067/S0718-50062022000100219

Schiffman, L. G., Kanuk, L. L. and Wisenblit, J. (2010). *Consumer behavior: global edition*. Pearson education.

Sharma, A. (2019). Consumer behaviors and centennials. En Shukla, S., Gupta, K., Bhardwaj, P. (ed.), *Marketing to Centennials in digital world* (pp. 37-42). Book Bazooka Publication

Si, H., Shi, J. G., Tang, D., Wu, G. and Lan, J. (2020). Understanding intention and behavior toward sustainable usage of bike sharing by extending the theory of planned behavior. *Resources, Conservation and Recycling, 152*, 104513. https://doi.org/10.1016/j.resconrec.2019.104513

Stănescu, C. (2018). The responsible consumer in the digital age: on the conceptual shift from 'Average' to 'Responsible' consumer and the inadequacy of the 'Information Paradigm' in consumer financial protection. *Tilburg Law Review, 24*(1), 49-67. https://doi.10.5334/tilr.143

Setyawan, A., Noermijati, N., Sunaryo, S. and Aisjah, S. (2018). Green product buying intentions among young consumers: Extending the application of theory of planned behavior. *Problems and Perspectives in Management, 16*(2), 145-154. http://dx.doi.org/10.21511/ppm.16(2).2018.13

Song, S. and Kim, Y. (2018). Theory of virtue ethics: do consumers' good traits predict their socially responsible consumption? *Journal of Business Ethics, 152*(4), 1159-1175. https://doi.10.1007/s10551-016-3331-3

Song, Y., Qin, Z. and Yuan, Q. (2019). The impact of eco-label on the young Chinese generation: The mediation role of environmental awareness and product attributes in green purchase. *Sustainability, 11*(4), 973. https://doi.org/10.3390/su11040973

Soriano, J. L. and Mejía-Trejo, J. (2022). Modelado de ecuaciones estructurales en el campo de las Ciencias de la Administración. *Revista de Métodos Cuantitativos para la Economía y la Empresa, 33*, 242-263.

Su, C.-H., Tsai, C.-H., Chen, M.-H. and Lv, W. Q. (2019). U.S. Sustainable Food Market Generation Z Consumer Segments. *Sustainability, 11*(13), 3607. http://dx.doi.org/10.3390/su11133607

Taufique, K. M. R. and Vaithianathan, S. (2018). A fresh look at understanding green consumer behavior among young urban Indian consumers through the lens of Theory of Planned Behavior. *Journal of cleaner production, 183*, 46-55. https://doi.org/10.1016/j.jclepro.2018.02.097

Thompson, C. J. and Kumar, A. (2018). Beyond consumer responsibilization: Slow Food's actually existing neoliberalism. *Journal of Consumer Culture, 21*(2), 317-336. https://doi.org/10.1177/1469540518818632

Trudel, R. (2019). Sustainable consumer behavior. *Consumer psychology review, 2*(1), 85-96. https://doi.org/10.1002/arcp.1045

Umpfenbach, E. L., Dalkiran, E., Chinnam, R. B. and Murat, A. E. (2018). Promoting sustainability of automotive products through strategic assortment planning. *European Journal of Operational Research, 269*(1), 272-285. https://doi.org/10.1016/j.ejor.2017.08.031

Wakeman, S. W., Tsalis, G., Jensen, B. B. and Aschemann-Witzel, J. (2022). Seeing the issue differently (or not at all): how bounded ethicality complicates coordination towards sustainability goals. *Journal of Business Ethics, 178*(2), 325-338. https://doi.org/10.1007/s10551-021-04823-2

Wang, C., Ghadimi, P., Lim, M. K. and Tseng, M. L. (2019). A literature review of sustainable consumption and production: A comparative analysis in developed and developing economies. *Journal of cleaner production, 206*, 741-754. https://doi.org/10.1016/j.jclepro.2018.09.172

Wang, J., Shen, M. and Chu, M. (2021). Why is green consumption easier said than done? Exploring the green consumption attitude-intention gap in China with behavioral reasoning theory. *Cleaner and Responsible Consumption, 2*, 100015. https://doi.org/10.1016/j.clrc.2021.100015

White, K., Habib, R. and Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing, 83*(3), 22-49. https://doi.org/10.1177/0022242919825649

Wu, B. and Yang, Z. (2018). The impact of moral identity on consumers' green consumption tendency: The role of perceived responsibility for environmental damage. *Journal of Environmental Psychology, 59*, 74-84. https://doi.org/10.1016/j.jenvp.2018.08.011

Yuriev, A., Dahmen, M., Paillé, P., Boiral, O. and Guillaumie, L. (2020). Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling, 155*, 104660. https://doi.org/10.1016/j.resconrec.2019.104660

Zheng, G. W., Siddik, A. B., Masukujjaman, M., Alam, S. S. and Akter, A. (2020). Perceived environmental responsibilities and green buying behavior: The mediating effect of attitude. *Sustainability, 13*(1), 35. https://doi.org/10.3390/su13010035

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.67-80
https://doi.org/10.17163/ret.n27.2024.05

Are you what you pay? Analysis of price knowledge and consumer profiles

¿Eres lo que pagas? Análisis de conocimiento de precios y perfiles de consumidores

Isabel Cristina Flores-Rueda
Professor at Universidad Autónoma de San Luis Potosí-UASLP, Mexico
isabel.flores@uaslp.mx
https://orcid.org/0000-0003-1257-2893

Armando Sánchez-Macías
Professor at Universidad Autónoma de San Luis Potosí-UASLP, Mexico
armando.sanchez@uaslp.mx
https://orcid.org/0000-0001-9575-3248

Mónica Eugenia Peñalosa-Otero
Professor at Universidad de Bogotá Jorge Tadeo Lozano, Colombia
monica.penalosa@utadeo.edu.co
https://orcid.org/0000-0002-2208-9224

Sofía Cheverría-Rivera
Professor at Universidad Autónoma de San Luis Potosí-UASLP, Mexico
sofia@uaslp.mx
https://orcid.org/0000-0003-1099-8719

Received on: 11/12/23 **Revised o**n: 16/01/24 **Approved** on: 22/02/24 **Published** on: 01/04/24

Abstract: the present research addresses the diversity of traits in the Mexican retail market, aiming to find fundamental common attributes among consumers in retail stores. Aim: To examine differences in preferences among various consumer segments regarding pricing strategies implemented by a supermarket and their role in fostering a transformative experience. Five prosperous consumer segments are highlighted: i) myopic switcher light, ii) strategic switchers light, iii) myopic switchers heavy, iv) strategic loyal heavy, and v) myopic loyal light. The application of the segmentation approach allows decision-makers to discern more accepted strategies in each segment, easing an understanding of how to effectively address the distinctive characteristics of consumers. This informed approach supplies a valuable framework for specialists and marketing decision-makers, enabling them to adapt specific strategies grounded regarding the diverse preferences exhibited by consumers in the Mexican retail sector. The research highlights the feasibility of adopting market segmentation-based pricing strategies in various regions, providing practical milestones to streamline the implementation of pricing tactics in the Mexican retail context.

Keywords: pricing strategy, retail management, multivariate analysis.

Suggested citation: Flores-Rueda, I. C., Sánchez-Macías, A., Peñalosa-Otero, M. E. and Cheverría-Rivera S. (2024). Are you what you pay? Analysis of price knowledge and consumer profiles. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 67-80. https://doi.org/10.17163/ret.n27.2024.05

Resumen: esta investigación aborda la diversidad de rasgos en el mercado minorista mexicano, buscando identificar atributos comunes fundamentales entre los consumidores de tiendas de retail. El objetivo es analizar las variaciones en las preferencias de distintos tipos de consumidores con respecto a las estrategias de precios implementadas por un supermercado y cómo estas contribuyen a una experiencia transformadora. Se destacan cinco segmentos de consumidores prósperos: i) myopic switcher light, ii) strategic switchers light, iii) myopic switchers heavy, iv) strategic loyal heavy, y v) myopic loyal light. La aplicación del enfoque de segmentación permite a los tomadores de decisiones discernir estrategias más aceptadas en cada segmento, facilitando la comprensión de cómo abordar efectivamente las características distintivas de los consumidores. Este enfoque informado proporciona un marco valioso para especialistas y tomadores de decisiones de marketing, permitiéndoles adaptar estrategias específicas según las preferencias diferenciadas de los consumidores en el mercado minorista mexicano. La investigación destaca la viabilidad de adoptar estrategias de precios basadas en la segmentación de mercado en distintas regiones, ofreciendo hitos prácticos para eficientizar la implementación de tácticas de precios en el contexto retail en México.

Palabras clave: estrategias de precios, gestión minorista, análisis multivariable.

Introduction

Consumer behavior, influenced by pricing strategies, often presents challenges for retailers, motivating the exploration of pricing tactics (Li and Peng, 2020), because price is an element that encompasses objective and subjective aspects, and challenges rational paradigms in consumer behavior studies (Hinterhuber, 2015). Cheah *et al.* (2020) highlight the crucial role of the price image, closely linked to the perception of value, confidence and consumer attitude (Boada *et al.*, 2022), making common pricing strategies, such as promotions and discounts, to attract interested customers (Park *et al.*, 2020), thus recognized events such as *Black Friday* and seasonal promotions (Cheah *et al.*, 2020) adapt well, conferring an advantageous positioning for *retail* smaller businesses *(Mandviwalla and Flanagan, 2021).*

Factors such as demand, growth potential, perceived service, price elasticity and perceived quality help to create more effective pricing strategies (Chen *et al.*, 2020) as dynamic pricing, however, in the absence of direct physical interaction, price becomes a decisive indicator of product qualities (Wang *et al.*, 2020; Kalyanaram *et al.*, 2022). Especially in *Personalized Dynamic Pricing* (PDP) which involves adjustments based on supply, demand and competition and is supported by evidence, suggesting that customers consider price as a reliable indicator of product quality (Priester *et al.*, 2020). The perception of equity plays an essential role in price acceptance, influencing attitudes ranging from reasonable to fair (Priester *et al.*, 2020; Theysohn *et al.*, 2013). Few studies focus on consumer segments and their attitudes towards *retail* store pricing strategies; even authors such as Cheah *et al.* (2020) identify that few academic studies have investigated the consequences of retail price imaging, while others classify such research as sporadic due to a lack of consensus in analyzing individual differences in consumer susceptibility to pricing practices.

Literature review

The study of consumer behavior in the face of price changes and price discrimination is based on a little-explored concept in the literature described as Pricing Tactic Persuasion Knowledge (PTPK). Chen *et al.* (2021) used consumers' persuasive knowledge of marketing specialists' pricing tactics as an approach to determine whether the impact of these promotions could be improved or diminished, concluding that increasing the frequency of exposure to these products—virtuous and vice foods—could have a positive effect on decisions to buy any product. This concept (PTPK) involves interdisciplinary findings of behavior, operations research, economics, marketing and management, among others that seek to identify how consumers react to different price perceptions, even those labeled by the consumer as unfair — compared to prices perceived as fair — it is a fact that consumers react differently to increases or falls in reference prices of products (Kalyanaram *et al.*, 2022).

Therefore, it is worth highlighting the importance of perception as a mechanism for receiving, interpreting and understanding external signals that will acquire a meaning after a cognitive process in purchasing decisions, in the communica-

print ISSN: 1390-6291; electronic ISSN: 1390-8618

tion of the quality and value of the product, social and emotional benefit, among others (Büyükdağ *et al.*, 2020). This is evidenced in psychological pricing strategies, where, according to the analysis of consumer perception, consumers tend to show a preference for prices that end in round figures (e.g. ninety, thousand, or other prices with zero endings), being particularly popular those that end in nine (e.g. ninety-nine), followed by those that end in five (forty-five).

This trend contributes to increasing product sales, in addition, Zhang *et al.* (2023) point out that both the coincidence between consumer preferences and the price sensitivity coefficient positively influence the price of the product and the company's profits, although they have diverse impacts on the demand for the product. Differences in the perceived value of the three types of consumers are identified, with matching consumers being the optimal group. When *retail* stores develop and implement pricing strategies, they do so undoubtedly with the purpose of being profitable and sustainable over time. However, Hinterhuber (2015) argues that beyond working with traditional pricing models, what is important is to analyze the profile of the consumer and how he/she interprets psychological prices, as well as to consider social comparison, rather than past *experiences, which influence fair price judgments. The pricing matching guarantee strategy (PMG)* is based on this dynamic, where retailers adjust prices and refund the difference if consumers find lower prices after purchase, causing demand and price competition to increase, leading retailers to offer more meaningful promotions (Li and Peng, 2020).

Market segmentation

Market segmentation guides decisions in marketing, allowing to adapt strategies and standardization degrees according to the market (Hajibaba *et al.*, 2020); even in contexts such as *e-commerce,* there is a desire to micro-segment (Kalyanaram *et al.*, 2022). Authors such as Gisches *et al.* (2021) point out that in markets with multiple sales periods, the presence of myopic consumers is assumed, but there are other types in the market.

Segmentation is a powerful tool that allows to know more deeply specific markets and, based on previous research, there are consumption differences in attitudes, motivations and use of products (Hassan *et al.*, 2022). This allows us to identify new consumption behaviors and, therefore, generates new opportunities in the market (Mejía and Valencia, 2024).

Aviv *et al.* (2019) and Wang *et al.* (2017) have identified consumer behaviors in response to prices, highlighting those called *strategic*. These consumers consider the benefits of postponing the purchase in anticipation of end-of-season discounts. Wang *et al.* (2017) detail that *strategic* consumers make additional decisions, such as the time of purchase, recognizing future availability in the recovery market. Meanwhile, Gisches *et al.* (2021) define them as forward-looking consumers, considering the entire path of the price strategy and deciding when to buy.

Contrary to so-called strategic, Wang *et al.* (2017) define another behavior called *myopics* because they do not take future prices into account in their purchasing decisions, they buy only during the sale period and are not willing to return to the retailer during the recovery period because the value of the item is lower in that period or simply because these consumers are short-sighted and are willing to pay their value for the product. Gisches *et al.* (2021) mention that this type of behavior — *myopics* — is due to a selection of reserve values either from public or private knowledge, i.e., they are not actively involved in the decision-making process, and purchasing behavior focuses on purchasing the product immediately when its price is lower than its evaluation, opting to abstain from participating in the market.

Operations management scholars have extensively addressed research on strategic consumer behavior; since the 1970s, it has been shown that monopolists must sell products at marginal cost if strategic consumers expect price reductions. Currently, studies such as that of Wang *et al.* (2017) delve into the optimal price design of a seasonal product with *strategic* consumers, identifying the presence of a single price reduction and variable strategies to stimulate their purchase, highlighting inventory and price manipulation to induce

strategic consumers to buy during the sale period. In this sense, Wei *et al.* (2022) discuss the *strategic* consumers' anticipation to future price decrease due to the company's cost reduction, consequently, more consumers postpone their purchases, promoting dynamic pricing and engagement strategies. Yuan *et al.* (2023) underscore the importance of extending the limited duration of the exchange if all customers are myopic; in relation to this anticipation, Tang *et al.* (2021) identify strategic consumer segments with variation in wait times and different levels of patience in pricing and retail ordering decisions.

Priester *et al*. (2020) point out the recognition of behaviors due to their purchase history of light users and heavy users, in addition to noting that consumers evaluate pricing strategies based on the loyalty status that prices can change from differences between different sellers, differences in behavior that extend to the evaluation of pricing strategies based on the purchase history and consumer loyalty (Priester *et al.*, 2020; Aviv *et al.*, 2019) as well as levels of patience (Tang *et al.*, 2021).

Pricing Strategies

Seeking to leverage the strategic nature of certain consumer segments and adapt to their preferences to maximize business outcomes, Wang *et al.* (2017) point specific strategies aimed at strategic consumers: i) targeted price reduction during sales periods for monopolists; ii) limited inventory maintenance to create rationing risk; iii) use of early signage to evidence product quality; iv) dynamic approaches such as delayed price matching; v) creation of shortage perceptions with limited releases. According to Shirai and Satomura, (2021), there is no universally appropriate pricing strategy approach for mass consumer products, as valuation must consider factors such as quality, customer service, ability to pay, and even the quantity of the product. The new pricing instruments represent an important strategic potential for retailers (Priester *et al.*, 2020), who are beginning to implement this practice comprehensively (Zuiderveen-Borgesius and Poort, 2017). Table 1 summarizes the main variables and approaches obtained by outstanding empirical studies that address the prospect of customer segmentation due to their behavior before price strategies.

This research (see Table 1) addresses the impacts of markets on the various pricing strategies studied. According to Boada *et al.* (2022), it is crucial to analyze not only the technical aspects when establishing prices, but also the subjective elements of the consumer, because knowledge of the price is not the only element of decision to purchase a product. Strategies such as discounts and low prices near the expiration date seek to influence purchasing behavior, optimizing revenue and reducing waste (Zorbas *et al.*, 2020). There is no universal pricing strategy that is perfect for all retail stores; a balanced approach is needed that consider business and production costs, consumer trends, revenue targets and competitors' prices.

Table 1
Key variables analyzed in pricing strategies

Variables	Approach to pricing strategy	Main authors
High-Low Prices (Hi-Low)	The Hi-Low strategy consists of setting high initial prices and then reducing them through discounts to attract consumers willing to pay more and reach those most sensitive to the price. Although it focuses on price-sensitive buyers, this strategy faces challenges linked to brand perception and customer loyalty.	Zhang *et al.* (2023) Hinterhuber (2015)
Discounts on added prices	The commercial value of the product in addition to the discounts is a determining factor when making a purchase, especially for low-income households, sensitive to price reduction strategies, such as promotions.	Zorbas *et al.* (2020)

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Variables	Approach to pricing strategy	Main authors
Benefit prices, seasonal and special prices for healthy products	These strategies are intended to give customers a lower total cost to incentivize the purchase; it is crucial not to increase the initial price too much, as this can make the strategy not work. People, being risk averse, usually choose the easiest and fastest option, such as getting something for free, without the need to make calculations; however, consumers evaluate whether they get additional benefits or complementary products before deciding.	Zorbas *et al*. (2020); Ku *et al*. (2020), Hinterhuber (2015)
Price-matching with other retailers	Price matching involves matching prices with other retailers, generating competitiveness and customer retention, but presents challenges such as pressure on profit margins. This strategy benefits competitiveness, it also poses challenges such as pressure on profit margins.	(Li & Peng, 2020; Gonzaga-Añazco *et al*. 2018)
Discounts for errors in price signage or for approaching the expiry date	They can benefit the consumer when there are labeling errors, highlighting the importance of transparency in transactions, while proximity discounts seek to reduce food waste and provide more accessible options to consumers.	Nakandala *et al*. (2020)

Note. Based on Zhang *et al.* (2023); Nakandala *et al.* (2020); Zorbas *et al.* (2020), Ku *et al.*

In the context of the discriminated prices, Wang *et al*. (2017) highlight the presence of strategic and myopic consumers during the sale period, differentiating their behavior before inventory and price decisions. The taxonomy of price discrimination addresses different degrees of scope in segment knowledge (Shirai and Satomura, 2021) and the implementation of pricing strategies should be carefully considered by luxury retailers and even wholesalers. Cheah *et al*. (2020) suggest that, instead of simply lowering prices significantly, luxury retailers can formulate or evaluate positioning strategies in relation to their target markets, which involves creating a more attractive price image, offering "value for money" in a creative and practical way. It is essential to know that a pricing strategy that involves significantly reducing prices could be detrimental to the luxury appeal of the product.

The study by Yuan *et al.* (2023) sheds light on managerial decisions regarding products of successive generations under conditions of limited duration of exchange and the presence of strategic clients. The results suggest that to maximize profits, it is beneficial to extend the limited duration of the exchange, advocating the implementation of a dynamic pricing strategy.

The investigation of the effects of price strategies on consumer purchasing decisions as well as their loyalty to brands is fundamental in the retail market (Arora *et al.*, 2022), therefore, new price instruments represent a constantly evolving strategic potential (Zuiderveen-Borgesius and Poort, 2017). However, apart from considering technical aspects, it is necessary to take into account the subjective aspects of the consumer, recognizing that price is only one aspect among several determining factors in the purchase process (Boada *et al.*, 2022).

As a result of the analysis of the theoretical background, fundamental questions are raised about consumers' price inclinations, investigating the differences between loyal and rebranding consumers, as well as reactions to temporary and long-term offers. The research issue that guides this study is:

> PI1. *Are there different types of consumers around their preferences and knowledge of pricing strategies, and how can these strategies contribute to an experience that fosters consumer loyalty?*

This study seeks to shed light on the complications associated with pricing strategies and their influence on consumer purchasing behavior, identifying and analyzing significant variations in preferences for pricing strategies; it focuses on understanding how these practices impact consumer loyalty, providing valuable ideas for the design of commercial strategies that promote positive results for both consumers and companies. In addition, it is necessary to clarify that the pricing

strategies analyzed in this study were found in a *retail* environment and were not created or set for the specific purpose of this research, but instead they focus on the real price dynamics observed in the retail market by the consumer, providing an authentic analysis of the interaction between the pricing knowledge that consumers have and the profiles around it.

Materials and method

To propose a segmentation of consumers according to their preferences by different pricing strategies in retail stores, and to collect the data a simple random sampling technique was needed, which ensured that each individual in the population had the same probability of selecting it. The calculation of the descriptive research considers a population of more than 100 000 inhabitants (N). From the formula of finite populations and taking into account an error of 7%, a confidence level of 95% (Z score = 1.96), a response of 208 complete questionnaires of different consumers is obtained. The sausages department of the supermarket presents a variation in price strategies due to the nature of fresh products which may present different market structures, as well as price policies based on the deterioration of freshness and competition (Nakandala *et al.*, 2020), based on the characteristics of the products and consumers surveyed, it is necessary to segment consumers from a cluster analysis, considering the revised dimensions in the literature on price knowledge that are the proposed observable variables; i) low prices, HI-LO prices, discount prices ii) season prices, healthy products and price-benefit ratio, iii) price equalization, discount prices, iii) poor signaling and, iv) expiration prices.

On the latent variables, it is necessary to explain that they were carefully selected from the literature review to capture a comprehensive image of how price strategies impact on purchasing decisions and consumer loyalty; consequently, blocks of observable variables (indicators) were designed referring to the strategies used for low prices, HI-LO prices, discount prices following the work of Bozkurt and Gligor (2019), Díaz and Paredes (2019) and Chung and Li (2013), while for the strategies used for seasonal prices, healthy products and price-benefit ratio the works of Díaz and Paredes (2019) and Ali (2021) were used; on price equalization and discount prices follows the work of Yan and Ke (2015), while for the strategies of poor signaling some indicators of Bozkurt and Gligor (2019), Díaz and Paredes (2019), on expiration prices are taken as a reference Chung and Li (2013) and characteristics of the profile of the consumer surveyed as marital status, age, occupation, sex with which it is identified. Specifically, a structured instrument of 39 indicators is designed that address the four observable variables proposed with the preferences of consumers on the price strategies performed by the sausages department of the *retail* store. The answers oriented to respond to the preferences of consumers on the price strategies were closed questions on a 5-position Likert scale (5 = Total agreement - 1 = Total disagreement).

Analysis and statistical validity of the instrument consumer behavior in relation to pricing

Using the IBM SPSS 19 and IBM AMOS statistics, where an exploratory factor analysis was first performed to examine the distribution of the studied constructs and among the results it is highlighted that the data did not reflect problems, from the varimax rotation and the main axis extraction method, five constructs were revealed that explain 45.16% of the total explained variance. The overall Kaiser-Mayer-Olkin (KMO) measure is 0.881 and the results of the Bartlett sphericity test are statistically significant ($p < 0.000$), indicating that the data are ideal for factorization. Therefore, confirmatory factor analysis is carried out to evaluate the convergent and discriminant validity of the instrument measures, and the measurement model shows an adequate level of fit: Chi square (x2) = 422.00 (p=0.000); CFI = 0.930; IFI = 0.931; RFI = 0.846; NFI = .871; RMSEA= 0.069. The findings of both exploratory and confirmatory factor analysis indicate that the proposed model correctly fits the criteria defined by Salgado and Espejel (2016).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Table 2

Model results of structural equations

Latent Variables	Observable variable codes	Exploratory factor		Confirmatory factor			Composite reliability, Cronbach alpha and convergent		
		Observable variable weights	Total explained variance cumulative%	λ	Measurement Error	Critical Ratio	VME	rc	α
Discounts, high and low prices (Hi-Low)	HI_LO2	0.655	15.14	1.000			0.683	0.992	0.937
	PRICING_LOW03	0.715		0.808	0.070	11.585			
	ESTRA_DES1	0.708		0.806	0.061	13.311			
	PRICING_LOW02	0.702		0.750	0.071	10.548			
	ESTRA_DES3	0.692		0.813	0.061	13.412			
Discounts, high and low prices (Hi-Low)	HI_LO5		15.14				0.683	0.992	0.937
	PRICING_LOW01	0.671		0.672	0.068	9.815			
	HI_LO4	0.599		0.748	0.064	11.692			
	HI_LO1	0.637		0.812	0.057	14.285			
	HI_LO3	0.600		0.861	0.069	12.521			
	ESTRA_DES2	0.725		0.833	0.059	14.137			
Prices-profit, season and healthy products	PREC_TEMP3	0.609	25.32	1.000			0.643	0.979	0.804
	PREC_TEMP1	0.587		0.987	0.084	11.791			
	PROD_SAL2	0.550		0.531	0.076	6.949			
	ESTR_REFE2	0.506		0.697	0.090	7.778			
	PRECI_BENE2	0.596		0.687	0.071	9.682			
Price matching with other retailers	PREC_EQUAL2	0.745	34.69	1.000			0.719	0.976	0.780
	OFER_PREC3	0.723		0.642	0.081	7.971			
	PREC_EQUAL1	0.657		0.863	0.076	11.289			
Low prices for closeness to expiry date	CADU_FIXED2	0.725	40.87	1.000			0.826	0.971	0.833
	CADU_FIXED1	0.738		0.808	0.097	8.350			
Discounts for errors in price signals	BAD_SIGN1	0.596	45.16	1.000			0.800	0.937	0.685
	BAD_SIGN2	0.561		0.774	0.210	3.679			

Note. Elaboration based on the results.

In addition, the Cronbach's Alpha coefficient (α) —which must be greater than 0.7— indicates that the latent variables present a good internal consistency. However, it was necessary to evaluate the convergent validity that refers to the evaluation of several indicators —observable

variables— aimed at measuring the proposed latent variables, which represent the same thing. In this sense, the adjustment of these indicators is significant and show a high correlation. To carry it out the method proposed by Hair *et al.* (2010) and applied in economic studies by Forero-Bautista and Ortegón-Cortázar (2023) where from the calculation of the Extracted Mean Variance (VME) the shared variance between its latent variable is measured, providing a measure of convergence between factor and indicators, the data are considered to have adequate convergence due to all indicators, having a value above 0.5 and a composite reliability (CR) of at least 0.7, thus confirming the convergent validity (see values in Table 2).

In the evaluation of the discriminant validity, the method proposed by De la Rubia (2019) and Salgado and Espejel (2016) is followed, which involves the test of the extracted variance against correlations. This test consists in examining the factor correlation matrix (Table 3) and observing that the correlations between factors do not exceed 0.7, a higher value indicates a significant amount of shared variance. In addition, this correlation should not exceed that which already exists in relation to the measures suggested for another construct, i.e., to the result of the Mean Extracted Variance (MEV), in particular, the correlations between latent variables proposed are not higher than the amount of shared variance that they have with other variables proposed in the model. This analysis ensures that each construct measures a unique concept and is not strongly linked to others in the factor correlation matrix, thus validating discrimination between constructs.

Table 3
Matrix of correlations between latent variables

Construct	Discounts, high and low prices (Hi-Low)	Discounts for errors in price signal	Prices-profit, season and healthy products	Price matching with other retailers	Low prices for closeness to expiry date
Discounts, high and low prices (Hi-Low)	1.000	0.002	0.514	0.206	0.116
Discounts for errors in price signal	0.002	1.000	0.001	0.036	0.108
Prices-profit, season and healthy products	0.514	0.001	1.000	0.197	0.217
Price matching with other retailers	0.206	0.036	0.197	1.000	0.131
Low prices for closeness to expiry date	0.116	0.108	0.217	0.131	1.000

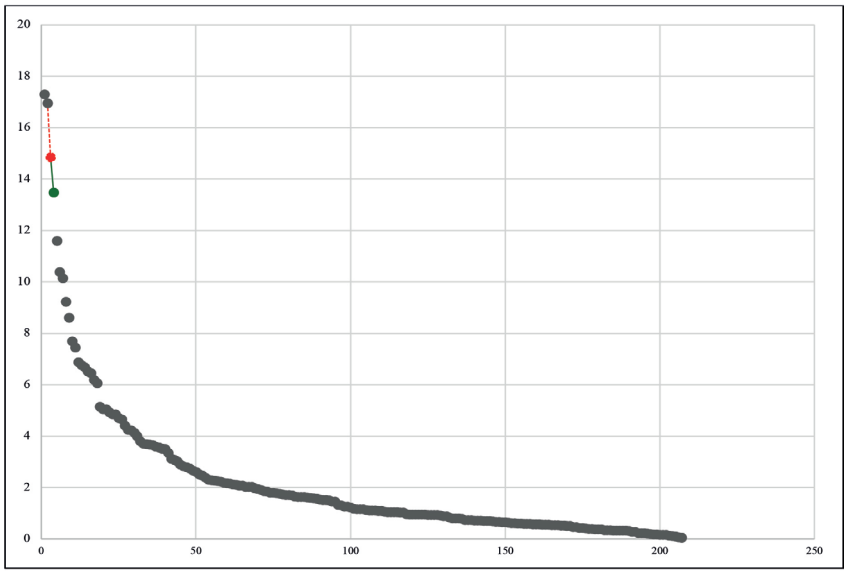
Note. Elaboration based on the results.

Multivariate analysis: clusters

Recent advances in cluster methods suggest using cluster techniques include hierarchical analysis, followed by k-mean analysis. Considering the above, both methods were performed for estimating the number of clusters and later check their suitability; on the hierarchical analysis data were used from the history of cluster which had a convergence of 207 stages, with coefficients between 0 and 17,304 distance values (see Figure 1).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Figure 1
Cluster history



Note. Elaboration based on the results.

Considering the number of groups as definitive, the k-mean analysis was carried out using the dimensions constructed from the literature review. The results confirm that consumers can be classified into five different types according to their price preferences at Walmart; the first group represents 17.78% of the total sample, the second group is the largest with 25.96%, the third group has 18.26%, almost similar to the fourth group with 18.75%, and finally, the last group constitutes 19.23% of the total sample. Table 3 summarizes the results of the k-mean analysis. It is relevant to note that the analysis of variance (ANOVA) confirms the significance of the five dimensions, showing that the strategies of discounts, high and low prices (Hi-Low), strategies of prices-profit, season and healthy products, strategy of price equalization with other retailers, discounts for errors in the price signal, and strategy of low prices by proximity to the expiry date are all significant at 95% ($p = 0.000$). In addition, it is highlighted that the dimension of price equalization and discount prices is the one that shows the greatest difference between the consumer segments of the retailer, as indicated by the values in column F.

Table 4
Results of k-means

Strategies/Segments	1	2	3	4	5	F	Sig.
	17.79 %	*25.96 %*	*18.27 %*	*18.75 %*	*19.23 %*		
Discounts, high and low prices (Hi-Low)	-0.76737	0.67249	-0.31572	0.515	-0.40034	28.178	0.000
Prices-profit, season and healthy products	-0.15474	0.13991	-0.07942	0.937	-0.88414	33.966	0.000
Price matching with other retailers	0.43219	0.46378	0.71186	-0.823	-0.90008	59.461	0.000
Discounts for errors in price signal	-0.81429	-0.12555	0.97469	0.102	-0.10307	31.475	0.000
Low prices for closeness to expiry date	-0.56756	0.74554	-0.12689	-0.411	0.04025	22.676	0.000

Note. Elaboration based on the results.

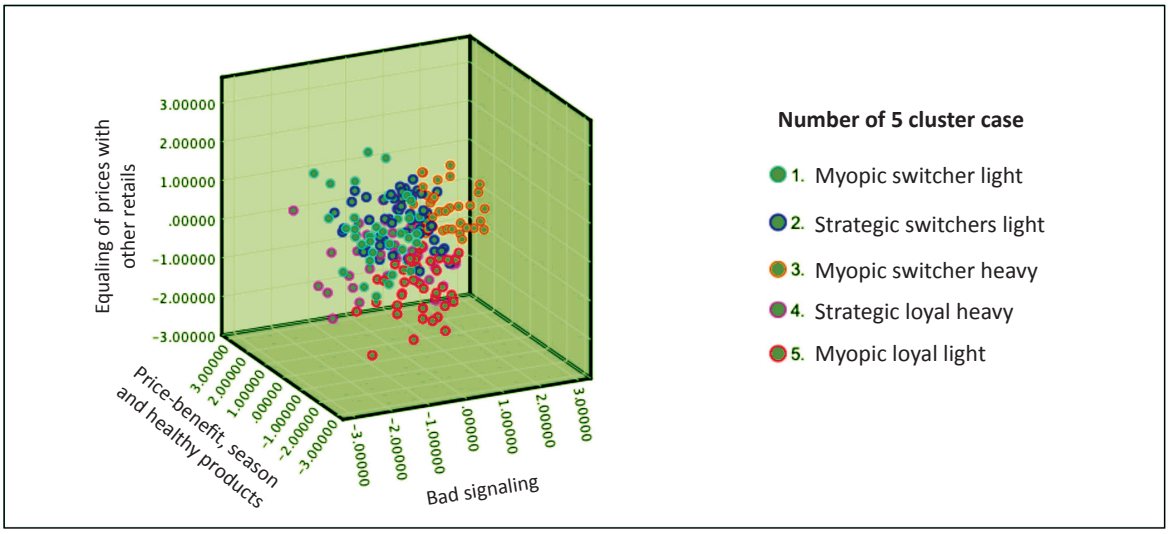
Results and discussion

The choice to use the terms *strategyc* and *myopic* as first references to describe consumer segments is based on the existing academic literature described in previous sections, which have established these terms as key categories for analyzing consumer and decision behavior in the context of pricing strategies, based on conceptual clarity and broad acceptance of these terms in academic research related to trade management and pricing strategy.

The first group of consumers in the retail store shows negative signals in relation to discounts, standing out in the standard deviation of price signage (CCF = -0.81429) and in high-low price strategies (CCF = -0.76737) compared to other similar conglomerates, in addition, it presents positive ratings in the price equalization strategy (CCF = 0.43219). The scores obtained suggest that these consumers do not have preferences that imply perceptions of financial savings, and the possibility that these consumers perceive that the discount strategies implemented do not meet their expectations is high, generating dissatisfaction with the promotional tactics of the retail store. This profile of consumers has been named consumers: *myopic switcher light* and constitutes the smallest fraction of the total sample, representing 17.79%. This small proportion within the consumer group shows its uniqueness and highlights the need for specific strategies to address and retain this market within the large customer landscape of the retail store.

The *second group* of consumers shows a positive inclination towards reduced prices, especially when products are close to their expiry date (CCF = 0.74554), however, this group exhibits the lowest negative rates in the acceptance of discounts associated with errors in price signaling (CCF = -0.12555), indicating a reluctance to take advantage of these mistakes to buy products at lower prices. These consumers have been identified as *strategyc switchers light* consumers because they tend to take advantage of the gradual decrease in prices on products close to the expiry date, but do not consider it favorable to take advantage of signaling errors to purchase more units of a product than initially planned. They make up the largest proportion in the total sample, representing 25.96% of the total, highlighting their strategic importance and the need to adjust business tactics to meet their distinctive preferences. Figure 2 illustrates cluster centers in the factors with the highest F score or that represent the largest difference between segments.

Figure 2
Grouped 3D scattering



Note. Elaboration based on the results.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Conclusions

The research addresses the challenge of identifying consumer profiles in the retail context according to their preferences towards various pricing strategies; five distinctive profiles emerged with significant variations in affinity towards specific strategies, these findings offer valuable insights to design personalized marketing strategies and tailor pricing tactics to the specific preferences of each segment, highlighting the importance of personalization for a transformative experience and improving consumer loyalty.

This study identifies, from the analysis of the literature explained in previous sections and empirical research, the distinction of two groups of dichotomous consumers: *strategic* and *myopics*; for *strategic loyal* heavy consumers, strategies such as price-earnings, seasonal prices and healthy products are preferred, strengthening loyalty. In contrast, *myopic switcher light* consumers, less receptive, show variable purchasing behaviors where the price matching strategy is crucial to differentiate between loyalists and *switchers*, therefore, retail stores must adapt pricing strategies according to the preferences of each segment to increase loyalty.

The managerial implications underscore the importance of understanding consumer profiles and customizing pricing strategies to transform the experience and foster loyalty, it also highlights that strategic behavior is not universal, and retailers must address challenges to identify variations in purchasing behaviors as well as creative strategies and improvements in the shopping experience, especially in prestigious areas, which can intensify interaction and connection between consumers and brands.

For future research, it is suggested to delve into the adaptation of tactics aimed at specific segments, such as the *myopic switcher light* group, characterized by its low receptivity towards certain pricing strategies, thus suggesting the need for a more personalized approach to understand their motivations and preferences. In addition, exploring how adaptive tactics can transform their behavior would provide practical *insights* for retailers seeking to improve their ability to adapt to the diversity of consumer purchasing behaviors. The professional contributions of this research guarantee its multidisciplinary application where personalized marketing strategies could be included, optimization in pricing strategies, improvement in customer experience, adaptation to the diversity of customer behavior, in disciplines such as marketing, *retail* sales, strategic planning, logistics, consumer experience, among others, offering valuable guidance for specialists and marketing decision makers in the effective personalization of retail strategies.The *third group* of consumers stands out for showing the highest and most positive values (CCF = 0.07469) in their willingness to take advantage of differenced in price signaling, while exhibiting negative and low values in relation to discount strategies and in high and low-price schemes (CCF = -0.31572). This profile corresponds to consumers who take advantage of the errors in the signal of the store or department to acquire products at lower prices. These consumers can be identified as *myopic switchers heavy*, since, despite being willing to take advantage of the signal errors, they do not show a clear inclination towards the active search for savings if it involves investing time and effort. This group, which capitalizes on errors in signaling, represents 18.27% of the total sample, highlighting its importance in the consumer landscape and pointing out the need for specific strategies to address their preferences.

The *fourth group* of consumers shows the highest values in price-earnings, seasonal and healthy products strategies (CCF = 0.97469), and the negatives in price-matching strategies with other retailers compared to other segments (CCF = -0.82263), in addition, it demonstrates significant loyalty to the retailer, based on its reluctance to buy products during special dates, such as Christmas. These consumers can be identified as *strategic loyal heavy* consumers, since, despite the efforts of other establishments in implementing pricing strategies, they maintain a high loyalty towards the retailer; their preference is based on the combination of strategies that highlight economic benefits, seasonal considerations and the selection of healthy products. The *strategic loyal heavy* occupies 18.75% of the total sample, indicating its importance in the group of consumers and highlighting the need

to preserve and strengthen the relationship with these customers through strategies that highlight their distinctive preferences.

The *fifth group* of consumers shows the lowest value in the price equalization strategy with other retailers (CCF = -0.90008), and in the strategies of price-earnings, prices per season and healthy products (CCF = -0.88414), despite its reluctance towards various price strategies, it presents positive values, although moderate, in the strategies of prices close to the expiry date (CCF = 0.04025). This consumer profile is tailored to the type of individuals who do not take advantage of the offers submitted by the retailer and do not see discount strategies as attractive. In addition, it is very likely that this consumer will not seek low prices if he/she seeks to invest time and effort. This type of consumer is called *myopic loyal light* in relation to all pricing strategies; their lack of receptivity to conventional discount strategies and indifference to price matching with other retailers suggest moderate but selective loyalty. By representing a specific and discernible component of the sample total, this segment highlights the importance of designing pricing strategies that align with their purchasing preferences and behaviors.

Referencias bibliográficas

Ali, B. (2021). Consumer attitudes towards healthy and organic food in the Kurdistan region of Iraq. *Management Science Letters, 11*(7), 2127-2134. https://doi.org/10.5267/j.msl.2021.2.015

Arora, A., Rani, N., Devi, C. y Gupta, S. (2022) Factors affecting consumer purchase intentions of organic food through fuzzy AHP, *International Journal of Quality & Reliability Management, 39*(5), 1085-1103. https://doi.org/10.1108/IJQRM-01-2021-0019

Aviv, Y., Wei, M. M. and Zhang, F. (2019). Responsive Pricing of fashion products: the effects of demand learning and strategic. Consumer behavior. *Management Science*, *65*(7), 2982-3000. https://doi.org/10.1287/mnsc.2018.3114

Boada, A, Herrera, B, Zapata, D. and Vahos, F. (2022). Fijación de precios: Estrategias que todo emprendimiento debe tener en cuenta. *Baltic Journal of Law & Politics*, *15*(3), 2198-2217. https://bit.ly/3wwJwIQ

Bozkurt, S. and Gligor, D. (2019). Customers' behavioral responses to unfavorable pricing errors: the role of perceived deception, dissatisfaction and price consciousness. *The Journal of Consumer Marketing*, *36*(6), 760-771. https://doi.org/10.1108/jcm-06-2018-2726

Büyükdağ, N., Soysal, A. N. and Kitapci, O. (2020). The effect of specific discount pattern in terms of price promotions on perceived price attractiveness and purchase intention: An experimental research. *Journal of Retailing and Consumer Services,* 55, 102112. https://doi.org/10.1016/j.jretconser.2020.102112

Cheah, Jun-Hwa, Waller, D., Thaichon, P., Ting, H. and Lim, Xin-Jean (2020). Price image and the sugrophobia effect on luxury retail purchase intention. *Journal of Retailing and Consumer Services*, *57*(102188). https://doi.org/10.1016/j.jretconser.2020.102188

Chen, Q., Huang, R. and Hou, B. (2020). Perceived authenticity of traditional branded restaurants (China): impacts on perceived quality, perceived value, and behavioural intentions, *Current Issues in Tourism, 23*(23), 2950-2971, https://doi.org/10.1080/13683500.2020.1776687

Chen, Y.-T., Lan, L.-C. and Fang, W.-C. (2021) What do customers want? The impact of pricing tactic persuasion knowledge and frequency of exposure, *British Food Journal,123*(7) 2321-2334. https://doi.org/10.1108/BFJ-04-2020-0343

Chung, J. and Li, D. (2013). The prospective impact of a multi-period pricing strategy on consumer perceptions for perishable foods. *British Food Journal (Croydon, England)*, *115*(3), 377-393. https://doi.org/10.1108/00070701311314200

De la Rubia, M. (2019). Revisión de los criterios para validez convergente estimada a través de la Varianza Media Extraída. *Psychologia. Avances de la disciplina*, *13*(2), 25-44. https://bit.ly/4bQbq2i

Díaz, M. G. and Paredes, C. M. (2019). *Relación entre las estrategias de fijación de precio y la decisión de compra en un supermercado en la ciudad de Cajamarca en el año 2018*. [Tesis de Grado]. Repositorio de la Universidad Privada del Norte. https://bit.ly/3IcCkUy

Forero-Bautista, A. and Ortegón-Cortázar, L. (2023). ¿Por qué visitar lifestyle centers? Variables alternativas de atracción a través de un modelo de ecuaciones estructurales. *Retos Revista de Ciencias de la Administración y Economía, 13*(25), 79-95. https://doi.org/10.17163/ret.n25.2023.06

Gisches, E. J., Qi, H., Becker, W. J. and Rapoport, A. (2021) Strategic retailers and myopic consumers: Competitive pricing of perishable

print ISSN: 1390-6291; electronic ISSN: 1390-8618

goods. *Journal of Behavioral and Experimental Economics*, *92*(101700). https://doi.org/10.1016/j.socec.2021.101700

Gonzaga-Añazco, S. J., Alaña-Castillo, T. P. and Yánez-Sarmiento, M. M. (2018). Estrategias para la fijación de precios de productos de consumo masivo en la provincia de El Oro. *Revista Universidad y Sociedad*, *10*(2), 221-227. https://bit.ly/3TjViPL

Hair, J. F., Black, W. C., Babin, B. J. and Anderson, R.E. (2010) *Multivariate Data Analysis.* 7th Edition. Pearson.

Hajibaba, H., Grün, B. and Dolnicar, S. (2020) Improving the stability of market segmentation analysis, *International Journal of Contemporary Hospitality Management*, *32*(4), 1393-1411, https://doi.org/10.1108/IJCHM-02-2019-0137

Hassan, N., Hashim, N., Padil, K. and Bakhary, N. (2022). Uncertainties: An investigation of aleatory and epistemic errors in market segmentation analysis. *Journal of Convention & Event Tourism*, *24*(1), 1-31. https://doi.org/10.1080/15470148.2022.2089796

Hinterhuber, A. (2015). Violations of rational choice principles in pricing decisions. *Industrial Marketing Management*, *47*, 65-74. https://doi.org/10.1016/j.indmarman.2015.02.006

Kalyanaram, G., Saini, G. K., Mony, S. and Jayasankaran, N. (2022) Behavioral response to online pricing: empirical and managerial insights, *Journal of Indian Business Research*, *14*(2), 167-185. https://doi.org/10.1108/JIBR-07-2021-0281

Ku, H.-H., Wang, S.-H. and Chiang, H.-W. (2020) Framing a promotional offer as free-with-purchase or as a bundle? The perspective of information salience, *Marketing Intelligence & Planning*, *38*(4), 495-507. https://doi.org/10.1108/MIP-04-2019-0198

Li, H. and Peng, T. (2020) How does heterogeneous consumer behavior affect pricing strategies of retailers? *IEEE Access*, *8* 165018-165033. https://doi.org/10.1109/ACCESS.2020.3022491

Mandviwalla, M. and Flanagan, R. (2021). Small business digital transformation in the context of the pandemic. *European Journal of Information Systems*, *30*(4), 359-375. https://doi.org/10.1080/0960085X.2021.1891004

Mejía, J. F. and Valencia, A. (2024). Un enfoque antropológico a la segmentación de mercados: aportes de las variables cualitativas en clasificación de consumidores/usuarios. *Tendencias*, *25*(1), 220-243. https://doi.org/10.22267/rtend.242501.247

Nakandala, D., Lau, H. and Zhang, J. (2021). Pricing of fresh food enterprises in different market structures. *Enterprise Information Systems*, *15*(3), 373-394. https://doi.org/10.1080/17517575.2020.1722250

Park, I., Jung, I. and Choi, J. (2020) Market competition and pricing strategies in retail supply chains, *Manage Decis Econ*., *41*(8), 1-11. https://doi.org/10.1002/mde.3200

Priester, A., Robbert, T. and Roth, S. (2020) A special price just for you: effects of personalized dynamic pricing on consumer fairness perceptions. *J Revenue Pricing Manag 19*, 99-112. https://doi.org/10.1057/s41272-019-00224-3

Salgado, L. and Espejel, J. E. (2016). Análisis del estudio de las relaciones causales en el marketing. *Innovar*, *26*(62), 79-94. https://doi.org/10.15446/innovar.v26n62.59390

Shirai, M. and Satomura, T. (2021) Unit pricing for multiple product sizes: identifying moderators and mediators of consumer evaluations, *European Journal of Marketing*, *55*(5), 1539-1566. https://doi.org/10.1108/EJM-08-2018-0560

Tang, Y., Song, Y., Xu, C. and Fan, T. (2021) Optimal pricing and ordering policies with different patience levels of consumers. *Industrial Management & Data Systems*,*121*(2), 436-455. https://doi.org/10.1108/IMDS-08-2020-0491

Theysohn, S., Klein, K., Völckner, F. and Spann, M. (2013). Dual effect-based market segmentation and price optimization. *Journal of Business Research*, *66*(4), 480-488. https://doi.org/10.1016/j.jbusres.2011.11.007

Wang, J., Pham, T. L. and Dang, V. T. (2020). Environmental consciousness and organic food purchase intention: a moderated mediation model of perceived food quality and price sensitivity. *Int. J. Environ. Res. Public Health*, *17*(3), 850. https://doi.org/10.3390/ijerph17030850

Wang, X., Ma, P. and Zhang, Y. (2017). Pricing and inventory strategies under quick response with strategic and myopic consumers. *International Transactions in Operational Research: A Journal of The International Federation of Operational Research Societies*, *27*, 1729-1750. https://doi.org/10.1111/itor.12453

Wei, Q., Zhang, J. and Zhu, G. (2022). Pricing and inventory carryover strategy considering cost learning effect and strategic consumers. *International Transactions in Operational Research: A Journal of The International Federation of Operational Research Societies*, *31*(1), 541-567. https://doi.org/10.1111/itor.13105

Yan, B. and Ke, C. (2018). Two strategies for dynamic perishable product pricing to consider in strategic consumer behaviour. *International Journal of Production Research*, *56*(5), 1757-1772. https://doi.org/10.1080/00207543.2015.1035814

Yuan, X., Ma, Z. and Zhang, X. (2023) Dynamic pricing for the successive-generation products in the presence of strategic customers and limited trade-in duration. *Kybernetes*, *52*(11), 5329-5352. https://doi.org/10.1108/K-02-2022-0237

Zhang, X., Gu, X. and Qu, Y. (2023) Research on pricing strategy of online education products considering consumers' matching degree and price comparison behavior. *Kybernetes*, 52(8), 2672-2692. https://doi.org/10.1108/K-11-2021-1141

Zorbas, C., Eyles, H., Orellana, L., Peeters, A., Mhurchu, C. N., Riesenberg, D. and Backholer, K. (2020). Do purchases of price promoted and generic branded foods and beverages vary according to food category and income level? Evidence from a consumer research panel. *Appetite*, *144*(104481). https://doi.org/10.1016/j.appet.2019.104481

Zuiderveen-Borgesius, F. and Poort, J. (2017). Online price discrimination and EU data privacy law. *Journal of Consumer Policy*, *40*(3), 347-366. https://doi.org/10.1007/s10603-017-9354-z

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.81-95
https://doi.org/10.17163/ret.n27.2024.06

Navigating the Digital Landscape: factors shaping entrepreneurial dynamics in Saudi Arabia

Una mirada por el panorama digital: factores que dan forma a la dinámica empresarial en Arabia Saudita

Basheer M. Al-Ghazali
Professor at King Fahd University of Petroleum & Minerals, Saudi Arabia. Department of Business Administration-DCC. Center for Finance and Digital Economy
basheer.alghazali@kfupm.edu.sa
https://orcid.org/0000-0003-3801-1744

Received on: 13/12/23 **Revised o**n: 14/01/24 **Approved** on: 26/02/24 **Published** on: 01/04/24

Abstract: this paper provides a comprehensive analysis of the factors impacting entrepreneurial intentions, behaviors, innovations, and the sense of self-efficacy in the digital entrepreneurial ecosystem in the Kingdom of Saudi Arabia. By illuminating the roles of the ecosystem, entrepreneurial intention, innovation, and education, the study aspires to provide insights into distinctive dynamics of digital entrepreneurship in this geographical setting. The study employs both qualitative in-depth interviews with subject matter experts and quantitative statistical analysis of survey responses. The Saudi digital entrepreneurial ecosystem is explored qualitatively through 15 in-depth interviews with industry experts and quantitatively with 248 survey responses that allow for hypothesis testing using structural equation modeling. The quantitative data in this study were analyzed using PLS-SEM. The results emphasize the mediating roles of entrepreneurial ambition and innovation, highlighting the key significance of the digital entrepreneurial ecosystem in driving entrepreneurial behavior. Entrepreneurial education is emerging as a powerful element, acting as a moderator in shaping entrepreneurial success. The research provides useful information about the unique characteristics of digital entrepreneurship in Saudi Arabia.

Keywords: entrepreneurship, ecosystem, intention, innovation, digital ecosystem, entrepreneurial education, entrepreneurs, Saudi Arabia.

Resumen: este artículo proporciona un análisis exhaustivo de los factores que impactan las intenciones, los comportamientos, las innovaciones y el sentido de autoeficacia empresarial en el ecosistema empresarial digital en el Reino de Arabia Saudita. Al ilustrar los roles del ecosistema, la intención empresarial, la innovación y la educación, el estudio aspira proporcionar información sobre las dinámicas distintivas del emprendimiento digital en este entorno geográfico. El estudio utiliza tanto entrevistas cualitativas con expertos en la materia como análisis estadístico cuantitativo de las respuestas de la encuesta. El ecosistema empresarial digital saudita se explora cualitativamente a través de 15 entrevistas con expertos de la industria y cuantitativamente con 248 respuestas a encuestas que permiten probar hipótesis utilizando modelos de ecuaciones estructurales. Los datos cuantitativos de este estudio se analizaron mediante PLS-SEM. Los resultados enfatizan los roles mediadores de la ambición empresarial y la innovación, destacando la importancia clave del ecosistema empresarial digital para impulsar el comportamiento empresarial. La educación empresarial surge como un elemento poderoso que actúa como moderador en la configuración del éxito empresarial. La investigación proporciona información útil sobre las características únicas del emprendimiento digital en Arabia Saudita.

Palabras clave: emprendimiento, ecosistema, intención, innovación, ecosistema digital, educación empresarial, emprendedores, Arabia Saudita.

Suggested citation: Al-Ghazali, B. M. (2024). Navigating the Digital Landscape: factors shaping entrepreneurial dynamics in Saudi Arabia. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 81-95. https://doi.org/10.17163/ret.n27.2024.06

Introduction

The rise of digital entrepreneurship has become a transformative force in the global economy, reshaping traditional business structures and opening new avenues for innovation and economic growth (Boscán Carroz *et al*., 2023). In an era marked by rapid technological advancements and digitization, entrepreneurial dynamics are evolving significantly (Witschel *et al*., 2019). Entrepreneurs now operate without physical constraints, leveraging the digital ecosystem for economic value creation and innovation (Jawad *et al*., 2021). Saudi Arabia has enthusiastically embraced the digital entrepreneurial revolution, witnessing a surge in digital enterprises and entrepreneurial endeavors (Hervé *et al*., 2021). This study aims to delve into the heart of the digital entrepreneurial ecosystem, offering a comprehensive analysis of the factors influencing entrepreneurial intentions, behaviors, innovation, and self-efficacy within the Saudi Arabian context.

Understanding the landscape of digital entrepreneurship in Saudi Arabia is crucial, given the nation's ongoing efforts to reduce reliance on traditional oil-dependent industries and foster economic diversification (Witschel *et al*., 2019). Recognizing the role of digital entrepreneurship in driving economic growth through innovation and technology, the government actively promotes exploring the intricate dynamics within the Saudi digital entrepreneurial ecosystem (Jafari-Sadeghi *et al*., 2021; Elia *et al*., 2020). Digital entrepreneurship thrives within a broader ecosystem that encompasses government laws, educational institutions, venture capital, business support networks, and cultural influences (Jawad *et al*., 2021; Zahra *et al*., 2023). Investigating these elements collectively is crucial to understanding the drivers of digital entrepreneurial activity in Saudi Arabia.

Beyond the opportunities presented by the digital landscape, the attitudes of individuals and organizations within the ecosystem play a pivotal role in unlocking its revolutionary potential (Aloulou, 2021). Entrepreneurial intentions, signaling the desire and readiness to engage in entrepreneurial activities, are essential precursors for entrepreneurial actions (Hervé *et al*., 2021). Therefore, this research focuses on understanding the factors influencing entrepreneurial intentions within the Saudi digital entrepreneurial ecosystem. Additionally, entrepreneurial innovation— the development and implementation of novel solutions in digital ventures— is a central theme, exploring its mediating role between the digital entrepreneurial ecosystem and entrepreneurial behavior (Amit and Zott, 2020; Schmidt *et al*., 2019). Innovation not only fuels economic growth but also enhances competitiveness and sustainability.

Self-efficacy, an individual's belief in one's capability to perform tasks and achieve goals, significantly shapes entrepreneurial activities (Shaikh *et al*., 2023). In the dynamic realm of digital entrepreneurship, self-efficacy influences individuals' propensity for launching and persisting in ventures (Gielnik *et al*., 2020; Yousaf *et al*., 2021). Thus, the research investigates the mediating role of entrepreneurial self-efficacy in the relationship between digital entrepreneurial ecosystem and entrepreneurial behavior. The role of entrepreneurial education in shaping intentions, innovation, and self-efficacy is another key focus, aligning with the Saudi government's emphasis on promoting entrepreneurship education (Martínez-Gregorio *et al*., 2021; Towers *et al*., 2020).

In summary, this study aims to provide a comprehensive analysis of the Saudi Arabian digital entrepreneurial ecosystem, focusing on its impact on entrepreneurial goals, behaviors, innovation, and self-efficacy. By examining the interaction of these elements, the research contributes to the development and sustainability of the digital entrepreneurial landscape in Saudi Arabia, aligning with the country's vision for economic diversification and technological advancement.

Literature review and hypotheses development

In today's global economy, there is a growing body of study and concern around the digital entrepreneurial environment. Because of the internet's absorption into our everyday lives and the quick progress of technology, the business environment has altered dramatically (Sedej, 2019). Within this framework, entrepreneurship has

print ISSN: 1390-6291; electronic ISSN: 1390-8618

assumed a digital aspect that surpasses the boundaries of conventional physical businesses (Volberda *et al*., 2021). Entrepreneurs today leverage digital technology to launch and expand their companies. The dynamics and interactions among these ecosystems have spawned an interesting area of study (Rippa and Secundo, 2019). An essential component of the ecosystem of digital entrepreneurship is the concept of "intentions." Understanding the factors that drive individuals to pursue digital entrepreneurship is essential in unpacking the nuances of this ecosystem (Palmié *et al*., 2022). Several studies have explored motivations, goals, and psychological factors shaping entrepreneurial intentions in the digital domain. These investigations delve into the ambitions of digital entrepreneurs, seeking to uncover what prompts them to embark on their entrepreneurial journey (Liang *et al*., 2023; Wang *et al*., 2021). The identification and analysis of these intentions provide a foundational understanding of how digital entrepreneurial ecosystems are structured and function (Martínez-Gregorio *et al*., 2021).

In parallel, innovation is a driving force in the digital entrepreneurial ecosystem (Palmié *et al*., 2022). Continuous technical breakthroughs in the rapidly expanding digital ecosystem generate both opportunities and challenges for businesses. This ecosystem's innovation is not confined to technology advancements; it also includes creative business structures, marketing methods, and problem-solving approaches (Schmidt *et al*., 2019). The incorporation of innovation into digital entrepreneurship is a complicated phenomenon, and the processes by which innovation is nurtured, distributed, and utilized within these ecosystems are interesting to both scholars and practitioners (Zahra *et al*., 2023). Furthermore, knowing how to harness innovation for the growth and sustainability of digital companies is an important study subject in this discipline. Education is another pivotal component of the digital entrepreneurial ecosystem (Hervé *et al*., 2021). As the digital landscape continues to evolve, the acquisition of relevant knowledge and skills has become indispensable for entrepreneurs. Developing skills and abilities in the digital sphere is greatly aided by entrepreneurial education (Wang *et al*., 2021). Together with informal learning from networks, mentors, and internet resources, official education programs are included in this dimension. This field's research investigates how training and education initiatives might improve people's entrepreneurial potential, which in turn helps digital businesses expand and succeed (Martínez-Gregorio *et al*., 2021). To improve our understanding of how these ecosystems work and change, we must look at the interactions between education and the other components of the digital entrepreneurial ecosystem.

The holistic analysis of digital entrepreneurial ecosystems involves an intricate interplay between intentions, innovation, and education (Gielnik *et al*., 2020). Understanding how these components are interconnected and influence each other is essential for comprehending the dynamics of this rapidly evolving field. Researchers in this field use various methodologies to study the subtle interactions among intentions, innovation, and education in the digital entrepreneurial context, ranging from qualitative case studies to quantitative surveys and analyses (Amit and Zott, 2020; Jawad *et al*., 2021; Sedej, 2019). Their findings shed information on how these ecosystems develop and evolve, as well as what characteristics are critical for long-term survival and growth (Kumar *et al*., 2020; Martínez-Gregorio *et al*., 2021). Finally, in the modern economy, the study of digital entrepreneurial ecosystems has arisen as an important research area. To understand the formation and operation of these ecosystems, it is critical to understand how entrepreneurial aspirations, innovation, and education interact. As digital technology continues to transform the corporate environment, research in this field provides important views for entrepreneurs, educators, lawmakers, and other stakeholders (Aloulou, 2021; Elia *et al*., 2020). This, in turn, enhances knowledge and aids in the development of strategies for developing a healthy digital entrepreneurial sector.

The qualitative phase of this research is instrumental in providing profound insights into the investigated hypotheses, focusing on the impact of the digital entrepreneurial environment (H1) and the mediating role of entrepreneurial intention (H2). Through expert interviews and relevant

literature, we delve into these assumptions, extracting valuable perspectives from key figures in the Saudi Arabian digital entrepreneurial landscape.

Interviewee 1, a Chief Executive Officer/ Founder of a Technology Startup, emphatically states, "I firmly believe that the environment in which we function has a substantial influence on the behavior and expansion of our company". This sentiment is echoed by Interviewee 7, an E-commerce Founder, who highlights the distinct and unparalleled nature of the Saudi Arabian ecosystem, shaping elements such as e-commerce platforms, payment gateways, and customer involvement. These expert responses strongly align with H1, supporting the notion that the digital entrepreneurial environment significantly influences digital entrepreneurial behavior. This resonates with existing literature on entrepreneurial ecosystems, emphasizing the external environment's impact on entrepreneurial activities (Cao and Shi, 2021; Shwetzer *et al*., 2019).

The venture into H2, examining the mediating role of entrepreneurial intention, unfolds through insights from Interviewee 3, a Venture Capitalist, who likens entrepreneurial intention to the fuel for the ecosystem. Similarly, Interviewee 6, a Startup Incubator Manager, sheds light on their role in shaping entrepreneurial intentions and guiding behavior within the ecosystem. The expert responses coalesce to support H2, emphasizing that entrepreneurial intention acts as a catalyst, translating ecosystem opportunities into tangible actions. This aligns with existing research underscoring the pivotal role of intention in driving entrepreneurial behaviors (Fragoso *et al*., 2020; Al-Jubari *et al*., 2019; Feola *et al*., 2019).

In summary, the qualitative analysis of expert interviews robustly supports both H1 and H2, laying the foundation for subsequent quantitative analysis within the context of the Saudi digital entrepreneurial ecosystem.

The exploration then extends to H3 examining the mediating role of entrepreneurial innovation. Academic Researcher (Interviewee 2) emphasizes, "At the heart of entrepreneurship is innovation," corroborated by Interviewee 10, the Chief Technology Officer (CTO) of a Tech Startup, highlighting access to cutting-edge technologies and expertise. These responses reinforce H3, asserting that entrepreneurial innovation significantly mediates the relationship between the digital entrepreneurial ecosystem and digital entrepreneurial behavior. The qualitative data accentuates the central role of innovation in shaping entrepreneurial activities within the Saudi digital ecosystem, aligning with the broader literature on innovation as a competitive advantage (Distanont and Khongmalai, 2020; Ferreira *et al*., 2020; Hwang *et al*., 2020).

Moving to H4, the exploration of entrepreneurial self-efficacy as a mediating factor involves insights from Interviewee 12, an Angel Investor, and Interviewee 14, a Digital Marketing Manager. Both stress the importance of individuals possessing a high degree of self-efficacy to initiate entrepreneurial activities within the dynamic ecosystem. This aligns with established literature on self-efficacy's role in influencing entrepreneurial intentions and behaviors (Shaikh *et al*., 2023; Udayanan, 2019), supporting H4's assertion that entrepreneurial self-efficacy significantly mediates the relationship between digital entrepreneurial ecosystem and digital entrepreneurial behavior.

In conclusion, the qualitative analysis supports both H3 and H4, enhancing our understanding of the dynamics within the Saudi Arabian digital entrepreneurial ecosystem and setting the stage for forthcoming quantitative research.

The investigation then expands its focus to H5, H6, and H7, collectively exploring the moderating role of entrepreneurial education. Interviewee 9, a University Professor, emphasizes the pivotal role of education in shaping entrepreneurial intentions, a sentiment echoed by Interviewee 13, a Tech Incubator Manager, highlighting how education enhances individuals' understanding of the ecosystem. These responses corroborate H5, asserting that entrepreneurial education significantly moderates the relationship between digital entrepreneurial ecosystem and entrepreneurial intention. The qualitative findings align with previous research emphasizing education's influence on entrepreneurial inclinations (Tomy and Pardede, 2020; Ratten and Usmanij, 2021).

H6 explores the moderating role of entrepreneurial education in relation to entrepreneurial innovation. In-sights from Interviewee 6, a

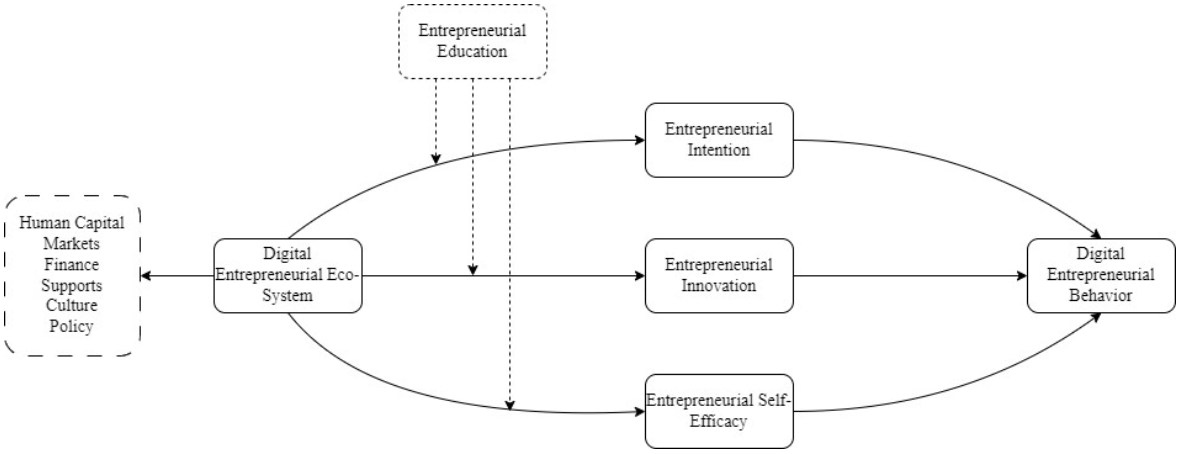
print ISSN: 1390-6291; electronic ISSN: 1390-8618

Startup Incubator Manager, and Interviewee 4, a Digital Marketer, highlight education's role in fostering innovative thinking and encouraging innovative strategies. This supports H6, emphasizing that entrepreneurial education significantly moderates the relationship between the digital entrepreneurial ecosystem and entrepreneurial innovation. The qualitative data underlines the importance of education in equipping individuals with the knowledge and skills to drive innovation within the entrepreneurial context, aligning with established research (Shu *et al*., 2020; Bauman and Lucy, 2021).

Finally, H7 explores the moderating role of entrepreneurial education in relation to entrepreneurial self-efficacy. Insights from Interviewee 8, a Tech Consultant, and Interviewee 12, an Angel Investor, underscore how education boosts self-efficacy and instills confidence. This aligns with H7, asserting that entrepreneurial education significantly moderates the relationship between the digital entrepreneurial ecosystem and entrepreneurial self-efficacy. The qualitative findings support the notion that education plays a crucial role in enhancing individuals' confidence and competence within the entrepreneurial landscape (Bux and Van Vuuren, 2019; Yousaf *et al*., 2021).

The hypotheses collectively form a comprehensive framework, encapsulating critical factors influencing behaviors, intentions, and innovative capacities within the Saudi Arabian digital entrepreneurial ecosystem. H1-H7, supported by qualitative insights, pave the way for rigorous quantitative analysis, contributing to a deeper understanding of this dynamic landscape. The intricate interplay of the digital entrepreneurial environment, individual intentions, creativity, self-efficacy, and the transformative impact of entrepreneurial education in the Saudi Arabian context represents a rich avenue for further exploration and research (see figure 1). The qualitative study serves as a crucial step, providing qualitative insights and perspectives that set the stage for robust quantitative validation and a more nuanced comprehension of Saudi Arabia's digital entrepreneurial ecosystem.

Figure 1
Conceptual model



Methodology

The research design of this study employed a mixed-methods strategy, incorporating both qualitative and quantitative data analysis. The study aimed to conduct a thorough analysis of the digital entrepreneurial environment in the Kingdom of Saudi Arabia in depth. This section provides a description of the data collection, sampling, and analysis procedures employed. The qualitative phase involved conducting semi-structured interviews with 15 industry experts to establish a

fundamental understanding of the digital entrepreneurial ecosystem and formulate prospective study hypotheses (refer to Table 1). These experts were selected for their knowledge and experience in digital entrepreneurship in Saudi Arabia. Each face-to-face interview had a duration of 45-60 minutes. Open-ended questions were formulated to extract detailed information on the ecosystem. These questions aimed at understanding and optimizing factors that contribute to the creation of a conducive entrepreneurial ecosystem fostering innovation, growth, and sustainability for startups and entrepreneurs. The topics covered included entrepreneurial goals, innovative behaviors, and the value of education. The specialists were purposefully selected based on their experience and involvement in Saudi Arabia's digital entrepreneurship ecosystem. This allows for a wide range of opinions and insights from various stakeholders. The interviewees were requested to share their experience navigating the local entrepreneurial ecosystem and elaborate on the role of educational support and entrepreneurial education in business development. The qualitative data from the interviews were transcribed and subjected to thematic examination. A systematic coding procedure was employed to identify recurring themes, patterns, and crucial insights. The data from this qualitative phase were used to develop research hypotheses, which were subsequently tested in the quantitative phase.

Table 1
Respondents Profile for Qualitative Part

Respondent ID	Gender	Age	Educational Background	Occupation/ Expertise	Years of Experience	Role in Digital Entrepreneurship
R1	Male	40	Ph.D. in Business	Entrepreneur	15 years	Founder/CEO of a Tech Startup
R2	Male	35	M.Sc. in IT	Academic Researcher	10 years	Researcher and Educator
R3	Male	45	MBA in Entrepreneurship	Venture Capitalist	20 years	Investor and Mentor
R4	Female	38	B.Sc. in Computer Science	Digital Marketer	8 years	Marketing Strategist
R5	Male	55	Ph.D. in Technology Management	Government Official	25 years	Policymaker in Digital Economy
R6	Female	30	BBA in Entrepreneurship	Startup Incubator Manager	5 years	Incubator and Ecosystem Builder
R7	Female	42	MBA in Finance	E-commerce Entrepreneur	18 years	Online Retail Business Owner
R8	Female	33	M.Sc. in Data Science	Tech Consultant	7 years	Technology Advisor
R9	Male	48	Ph.D. in Innovation	University Professor	12 years	Academic and Researcher
R10	Male	28	B.Sc. in Computer Engineering	Tech Startup CTO	6 years	Chief Technology Officer
R11	Female	37	MBA in Marketing	E-commerce Executive	16 years	Senior Management in Online Retail
R12	Male	50	B.Sc. in Finance	Angel Investor	22 years	Early-Stage Investment
R13	Male	34	M.Sc. in Entrepreneurship	Tech Incubator Manager	9 years	Incubation and Support
R14	Female	29	MBA in Strategy	Digital Marketing Manager	6 years	Marketing and Branding

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Respondent ID	Gender	Age	Educational Background	Occupation/ Expertise	Years of Experience	Role in Digital Entrepreneurship
R15	Male	43	Ph.D. in Technology Management	Tech Policy Advisor	17 years	Government Tech Policy Expert

During the quantitative phase, data was collected from 248 participants in Saudi Arabia actively engaged in digital entrepreneurship or possessing substantial knowledge about entrepreneurial activities. A structured questionnaire, aligned with qualitative hypotheses, was electronically distributed with instructions for timely completion. Non-probabilistic convenience sampling was employed to ensure participant accessibility. Respondents received the questionnaire through various online platforms and digital entrepreneurial organizations. PLS-SEM software was used to analyze the gathered data, utilizing descriptive statistics for sample characterization. Hypothesis testing, which employed inferential statistical methods like regression analysis, assessed relationships between variables derived from the qualitative phase. The integration of qualitative and quantitative data in the final analysis resulted in a comprehensive understanding of the Saudi digital entrepreneurial ecosystem.

Results and discussion

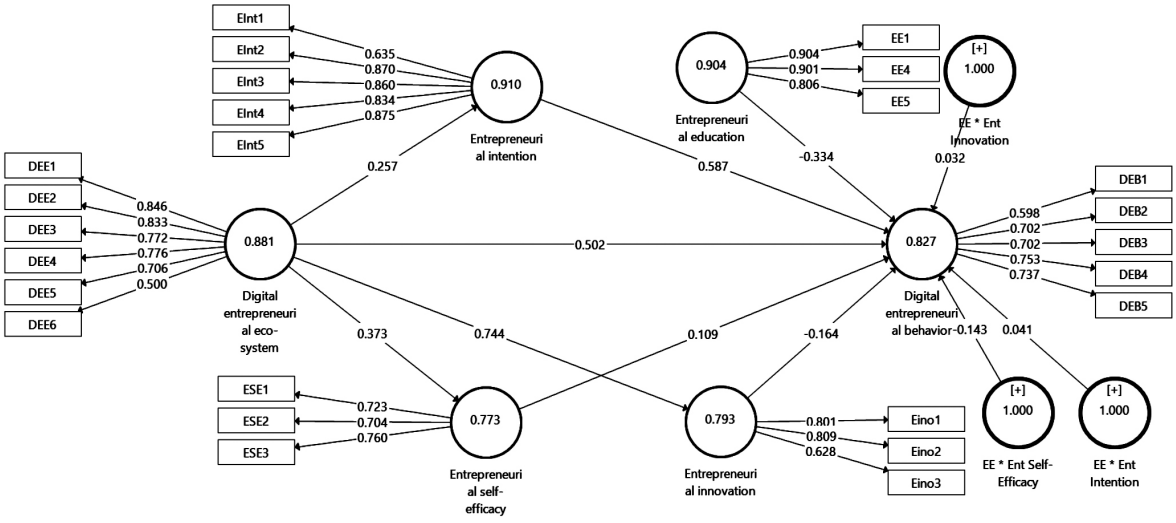
As a gauge of internal consistency, Cronbach's Alpha shows how strongly the elements within each construct correlate with one another. The findings demonstrate the validity and consistency of the measurement scales employed in this investigation. The Cronbach's Alpha value for digital entrepreneurial conduct is 0.760. This implies a moderate degree of internal consistency among the items measuring digital entrepreneurial behavior, suggesting that the items taken together offer a trustworthy measure of this construct. Likewise, the Cronbach's Alpha rating of 0.836 for the digital entrepreneurial environment indicates great internal consistency, meaning that the items used to evaluate the ecosystem's characteristics are very consistent.

With a Cronbach's Alpha score of 0.843, entrepreneurial education has a high degree of internal consistency. This shows that there is substantial agreement among the questions assessing the educational components, indicating that this construct is a reliable measure within the context of the study. Additionally, the Cronbach's Alpha value of 0.875 for entrepreneurial intention demonstrates the great internal consistency of the items and their reliability in gauging people's attempts to pursue entrepreneurship in the digital environment. With a modest amount of internal consistency, entrepreneurial innovation has a Cronbach's Alpha grade of 0.704. Although the items measuring the construct are trustworthy, there may be potential for improvement in terms of consistency among items measuring creative activities. While the construct's items are trustworthy, there may be potential for improvement in terms of consistency among items measuring creative activities. Finally, with a Cronbach's Alpha score of 0.798, entrepreneurial self-efficacy demonstrates good internal consistency, showing a solid agreement among the questions testing individuals' conviction in their talents within the entrepreneurial setting. These results show that the assessment scales utilized in this study are typically trustworthy and appropriate for capturing the many elements of the digital entrepreneurial environment, individual entrepreneurial education, innovative practices, entrepreneurial ambitions, and self-efficacy. This solid foundation of measurement reliability paves the way for the subsequent quantitative analysis, enabling a thorough examination of the relationships and hypotheses proposed in this research within the Saudi Arabian digital entrepreneurial ecosystem.

The composite reliability assesses the proportion of variation caught by the items within a construct (see figure 2), whereas the AVE assesses the proportion of variance captured by the items within a construct. Factor loadings for the construct of digital entrepreneurial behavior range between 0.598 and 0.753, signifying a high level of correlation between the items and the construct. The composite reliability for digital entrepreneurial activity is 0.827, indicating good internal consistency, and the AVE is 0.507, indica-

ting that its elements explain more than 50% of the variance in this construct. The factor loadings in the digital entrepreneurial ecosystem range from 0.500 to 0.846, indicating a reasonably strong connection between the items and the construct. The composite reliability is high at 0.881, highlighting the reliability of the construct's measurement, and the AVE stands at 0.560, indicating that a substantial portion of the variance in this construct is accounted for by its items.

Figure 2
Estimated model



The entrepreneurial education construct demonstrates substantial factor loadings, with values ranging from 0.806 to 0.904, signifying a strong relationship between the items and the construct. The composite reliability for entrepreneurial education is outstanding at 0.904, showing high internal consistency, and the AVE is 0.760, indicating that this construct's components capture a considerable part of the variation. The construct of entrepreneurial intention has factor loadings ranging from 0.635 to 0.875, indicating a strong relationship between the items and the construct. The composite reliability is 0.910, suggesting good internal consistency, and the AVE is 0.672, indicating that the items explain a significant percentage of the variance in this construct. Factor loadings for entrepreneurial self-efficacy range from 0.704 to 0.760, indicating a moderate relationship between the items and the construct. The composite reliability is 0.773, signifying good internal consistency, and the AVE is 0.532, suggesting that a significant portion of the variance in this construct is accounted for by its items. Lastly, the entrepreneurial innovation construct demonstrates substantial factor loadings, with values ranging from 0.628 to 0.809, signifying a strong relationship between the items and the construct. The composite reliability for entrepreneurial innovation is 0.793, reflecting good internal consistency, and the AVE is 0.563, indicating that a substantial proportion of the variance is captured by this construct's items. These findings collectively affirm the reliability and validity of the measurement scales used in the study, underscoring their suitability for examining the relationships and hypotheses within the Saudi Arabian digital entrepreneurial ecosystem.

Table 2 reports model fitness statistics, including Q^2predict, RMSE (Root Mean Square Error), and MAE (Mean Absolute Error). These statistics are crucial for assessing the predictive performance of a model. The Q^2predict value of 0.088 suggests that the model has some predictive ability, indicating that it can explain a proportion of the variance in the data. The RMSE of 0.063 represents the average prediction error, indicating how well the model's predictions align with the actual data, with lower values being more favo-

print ISSN: 1390-6291; electronic ISSN: 1390-8618

rable. Additionally, the MAE of 0.076 represents the absolute average prediction error, providing another measure of prediction accuracy. While these statistics indicate some predictive capability in the model, it is essential to interpret the values within the context of the specific research and its objectives. Further analyses and comparisons with other models or benchmarks are typically needed to evaluate the overall predictive performance comprehensively.

Table 2
Model fitness

Q^2prediction	RMSE	MAE
0,088	0,063	0,076

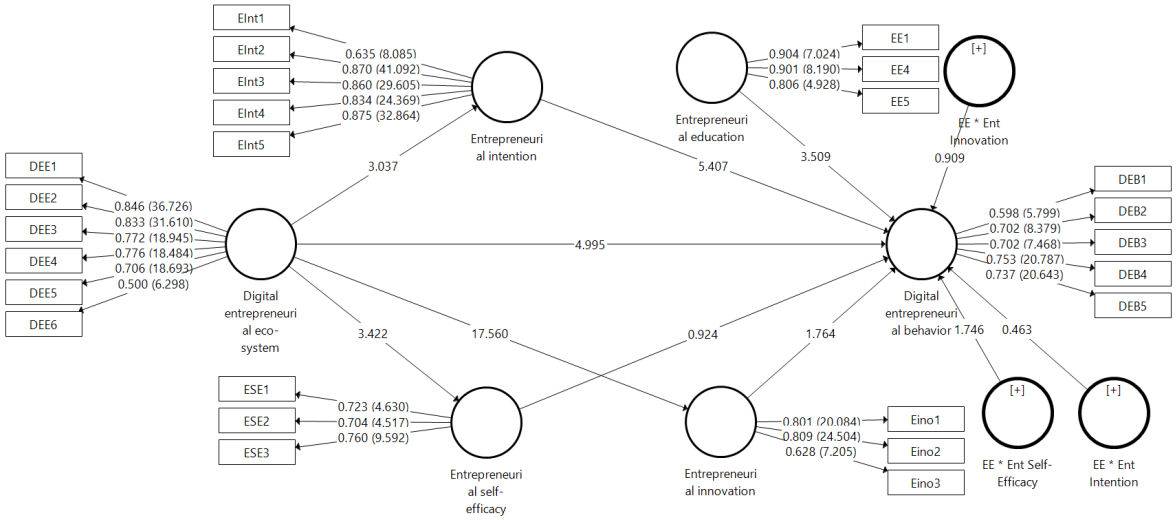
Table 3 shows the R-Square values for the model's major variables, revealing the proportion of variance in each construct that can be explained by the model. The R-Square values represent the model's goodness-of-fit for each variable. Digital entrepreneurial behavior has a significantly high R-Square of 0.617 in this table, indicating that the model explains a significant amount of the variance in this construct. This implies that the model captures and accounts for a considerable percentage of the diversity in digital entrepreneurial activity in the Saudi Arabian setting. Nevertheless, we find significantly lower R-Square values when we examine entrepreneurial creativity, entrepreneurial intention, and entrepreneurial self-efficacy. These variables indicate that there is some limitation in the model's ability to explain the variance in these constructs, with R-Square values of 0.554, 0.066, and 0.139, respectively. This could suggest that additional external or unmeasured factors, not part of the model, could also have a major impact on these variables. In order to increase the model's ability to explain these constructs, more research and possibly the addition of new variables are required, as these R-Square values demonstrate.

Table 3
R-Square

Variable	R square
Digital entrepreneurial behavior	0,617
Entrepreneurial innovation	0,554
Entrepreneurial intention	0,066
Entrepreneurial self-efficacy	0,139

A thorough summary of the route analysis results is given in Table 4, which also offers insights into the links and hypotheses that were investigated in the research. Each hypothesis is evaluated based on its original sample statistics, standard deviation, T statistics, and associated P-values. These statistics are vital in determining the significance and direction of the relationships in the model. H1, which posits that the digital entrepreneurial ecosystem significantly influences digital entrepreneurial behavior, shows a strong positive relationship with a T statistic of 5.034 and a highly significant P-value of 0.000. This supports the hypothesis that the digital entrepreneurial ecosystem plays a substantial role in shaping entrepreneurial behavior in the context of the study. H2, focusing on the mediating role of entrepreneurial intention in the relationship between the digital entrepreneurial ecosystem and digital entrepreneurial behavior, exhibits a positive relationship with a T statistic of 3.032 and a significant P-value of 0.001. This result affirms that entrepreneurial intention serves as a mediating factor in connecting the ecosystem with entrepreneurial behavior (see figure 3).

Figure 3
Structural model



H3, which relates to the mediating role of entrepreneurial innovation, has a negative connection with a T statistic of 1.856 and a P-value of 0.032. This indicates that entrepreneurial innovation does play a mediating role in this relationship, but the negative sign of the association warrants additional examination. The hypothesis H4, which claims that entrepreneurial self-efficacy mediates the association between the digital entrepreneurial environment and digital entrepreneurial activity, demonstrates a positive relationship with a T statistic of 1.112 and a P-value of 0.133. Although not statistically significant, it indicates a favorable influence, suggesting that entrepreneurial self-efficacy may have a role, albeit not as much as expected. H5, H6, and H7 focus on the moderating role of entrepreneurial education. With T statistics of 1.850 and 0.459, respectively, and corresponding P-values of 0.323 and 0.032, H5 and H7 show negative correlations. This implies that the correlations are moderated by entrepreneurial education, with H7 showing a more pronounced influence. With a T statistic of 0.919 and a P-value of 0.179, H6, on the other hand, demonstrates a favorable link but is not statistically significant, despite having a beneficial impact. The statistical results for each hypothesis are summarized in Table 8, providing insight into the importance and strength of the linkages between the digital entrepreneurial environment, self-efficacy, education, intention, innovation, and digital entrepreneurial behavior. These findings contribute to a nuanced understanding of the complex dynamics within the Saudi Arabian digital entrepreneurial ecosystem, enabling researchers and practitioners to make informed decisions and interventions in this context (refer to Table 4).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Table 4
Path analysis

	Original Sample	Standard Deviation	T Statistics	P Values
H1. Digital entrepreneurial ecosystem significantly influences the relationship of digital entrepreneurial behavior.	0,502	0,100	5,034	0,000
H2. Entrepreneurial intention significantly mediates the relationship of digital entrepreneurial ecosystem and digital entrepreneurial behavior.	0,151	0,050	3,032	0,001
H3. Entrepreneurial innovation significantly mediates the relationship of digital entrepreneurial ecosystem and digital entrepreneurial behavior.	-0,122	0,066	1,856	0,032
H4. Entrepreneurial self-efficacy significantly mediates the relationship of digital entrepreneurial ecosystem and digital entrepreneurial behavior.	0,041	0,037	1,112	0,133
H5. Entrepreneurial education significantly moderates the relationship of digital entrepreneurial ecosystem and entrepreneurial intention.	0,041	0,089	0,459	0,323
H6. Entrepreneurial education significantly moderates the relationship of digital entrepreneurial ecosystem and entrepreneurial innovation.	0,032	0,035	0,919	0,179
H7. Entrepreneurial education significantly moderates the relationship of digital entrepreneurial ecosystem and entrepreneurial self-efficacy.	-0,143	0,077	1,850	0,032

Integrating insights from expert interviews and statistical survey analysis, the study comprehensively examines factors impacting digital entrepreneurial behavior, intentions, creativity, self-confidence, and the role of entrepreneurial education. The qualitative phase, through expert interviews, provided valuable insights into the functioning of Saudi Arabia's digital entrepreneurship ecosystem, emphasizing its critical role in shaping tactics, practices, and behaviors (Ratten and Usmanij, 2021). The unique nature of the Saudi ecosystem, influencing technological aspects, business models, and customer engagement strategies, aligns with the notion that local contexts significantly impact entrepreneurial adaptation (Yousaf *et al*., 2021).

Expert interviews highlighted the importance of entrepreneurial intention, bridging the gap between ecosystem opportunities and actual behavior, echoing prior research on its pivotal role (Distanont and Khongmalai, 2020). The mediating role of entrepreneurial innovation, critical for entrepreneurial success (Wang *et al*., 2021), and the significant impact of entrepreneurial education on equipping individuals with necessary knowledge and skills align with existing literature (Martínez-Gregorio *et al*., 2021).

Quantitative analysis supported hypotheses, confirming the substantial impact of the digital entrepreneurial ecosystem on behavior (H1) and its mediation by entrepreneurial ambition (H2). While the unexpected negative correlation in the mediating influence of entrepreneurial innovation (H3) requires further exploration, a positive but statistically non-significant association supported the mediating role of entrepreneurial self-efficacy (H4). The moderating influence of entrepreneurial education (H5, H6, H7) showed mixed findings, indicating varying strengths of the moderating effect.

Conclusions

This study presented a thorough evaluation of the digital entrepreneurial ecosystem in the Kingdom of Saudi Arabia, incorporating insights from both qualitative expert interviews and quantitative studies. The study has helped us better understand the complex factors that shape digital

entrepreneurial behavior, intentions, innovation, self-efficacy, and the transformative significance of entrepreneurial education in this setting. The findings demonstrate the importance of the digital entrepreneurial ecosystem in directing entrepreneurial actions and behaviors, highlighting the importance of local ecosystems in developing digital entrepreneurship. Furthermore, the findings highlight the significance of entrepreneurial ambition and innovation as mediating elements in linking the digital entrepreneurial ecosystem to entrepreneurial behavior.

Digital entrepreneurial ecosystem significantly influences digital entrepreneurial behavior. The behavior of digital entrepreneurs is significantly influenced by the digital entrepreneurial ecosystem, which, through its effects on resource accessibility, technological infrastructure, regulatory frameworks, collaboration opportunities, market dynamics, cultural attitudes, talent availability, and global connectivity, plays a crucial role in shaping their strategies and actions. In an enabling ecosystem, entrepreneurs are more inclined to display innovative, adaptive, and growth-oriented behavior, capitalizing on the favorable conditions to pursue ambitious ventures and navigate challenges effectively. Entrepreneurial intention significantly mediates the relationship of digital entrepreneurial ecosystem and digital entrepreneurial behavior. Entrepreneurial intention plays a pivotal role as a mediator in connecting the digital entrepreneurial ecosystem with digital entrepreneurial behavior. It achieves this by aligning objectives with actions, serving as a source of motivation, impacting the inclination towards risk-taking, directing decision-making processes, molding the utilization of resources, enabling adaptive responses to changes in the ecosystem, fostering a commitment to long-term goals, and functioning as a precursor to entrepreneurial actions.

Entrepreneurial innovation significantly mediates the relationship of digital entrepreneurial ecosystem and digital entrepreneurial behavior. Entrepreneurial innovation plays a crucial role as a mediator in connecting the digital entrepreneurial ecosystem with digital entrepreneurial behavior. It serves as a catalyst for change, directs the effective utilization of technological resources, propels market differentiation, elevates problem-solving capabilities, promotes disruptive strategies, advocates for agility and adaptability, facilitates value creation, harnesses collaboration opportunities, and cultivates a culture that embraces risk-taking and experimentation. Entrepreneurial self-efficacy significantly mediates the relationship of digital entrepreneurial ecosystem and digital entrepreneurial behavior. Entrepreneurial self-efficacy influences digital entrepreneurial behavior by instilling confidence in individuals. When entrepreneurs believe in their ability to navigate the challenges of the digital ecosystem, they are more likely to take proactive steps, make decisions, and engage in entrepreneurial activities. Entrepreneurial education significantly moderates the relationship between digital entrepreneurial ecosystem and entrepreneurial intention. Entrepreneurial education equips individuals with a better understanding of the digital entrepreneurial ecosystem. This heightened awareness enables them to recognize and interpret opportunities within the ecosystem, influencing the strength of their entrepreneurial intentions.

Entrepreneurial education not only imparts knowledge but also develops practical skills necessary for entrepreneurial endeavors in the digital realm. Individuals with enhanced skills may feel more confident and capable of translating opportunities within the digital entrepreneurial ecosystem into concrete entrepreneurial intentions. Entrepreneurial education often addresses risk perception and management. Individuals who have undergone entrepreneurial education may approach the uncertainties within the digital entrepreneurial ecosystem with a more informed and strategic mindset, influencing their willingness to take entrepreneurial initiatives. Entrepreneurial education significantly moderates the relationship between digital entrepreneurial ecosystem and entrepreneurial innovation. Entrepreneurial education significantly moderates the relationship between digital entrepreneurial ecosystem and entrepreneurial self-efficacy. Entrepreneurial education may foster networking skills and collaboration abilities. Entrepreneurs with a strong network and collaborative mindset may be more adept at leveraging opportunities within the digital entrepreneurial ecosystem, thereby influencing their intentions to engage in entrepreneurial activities.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

The study makes theoretical contributions by enhancing understanding of the Saudi Arabian digital entrepreneurial ecosystem, emphasizing entrepreneurial intention and innovation as mediating elements. Another contribution that this study makes is the boundary condition of entrepreneurial education. It is important to understand the role of moderators while exploring ecosystems and this study suggests that one such moderator is entrepreneurial education. Practical implications suggest the need for tailored educational programs to support digital entrepreneurs and inform strategic decisions for governments and entrepreneurs. Insights into the significance of digital entrepreneurial elements provide a basis for advancing the global digital economy. Policy should focus on fostering entrepreneurial education and providing support for innovation so that new businesses can survive in the ecosystem.

Limitations of this study include the narrow focus on Saudi Arabia, limiting generalizability. Future research should conduct comparative studies across diverse entrepreneurial settings globally. Measurement challenges suggest the need for improvements in scales for variables such as entrepreneurial innovation and self-efficacy. Expanding geographical reach for comprehensive knowledge and further investigating the impact of entrepreneurial education are recommended. Investigating factors influencing entrepreneurial innovation and self-efficacy offers promising avenues. Given ongoing changes in the digital ecology, it is essential to track and evaluate the digital entrepreneurial landscape over time.

Acknowledgments

The author would like to acknowledge the support received from King Fahd University of Petroleum and Minerals under University Funded Grant # INFE2203.

References

Al-Jubari, I., Hassan, A. and Liñán, F. (2019). Entrepreneurial intention among University students in Malaysia: integrating self-determination theory and the theory of planned behavior. *International Entrepreneurship and Management Journal, 15*, 1323-1342. https://doi.org/10.1007/s11365-018-0529-0

Aloulou, W. J. (2021). 20. Mapping incubation mechanisms in Saudi Arabia: the state of the art and challenges for the future. *Handbook of Research on Business and Technology Incubation and Acceleration: A Global Perspective, 351*. https://bit.ly/3v0cQGW

Amit, R. and Zott, C. (2020). *Business model innovation strategy: Transformational concepts and tools for entrepreneurial leaders*: John Wiley & Sons. https://bit.ly/3uGpFX3

Bauman, A. and Lucy, C. (2021). Enhancing entrepreneurial education: Developing competencies for success. *The International Journal of Management Education, 19*(1), 100293. https://doi.org/10.1016/j.ijme.2019.03.005

Boscán Carroz, M. C., Meleán Romero, R. A., Chávez Vera, K. J. and Calanchez Urribarri, Á. (2023). Peruvian entrepreneurship in the framework of sustainable development. *Retos Revista de Ciencias de la Administración y Economía, 14(27), 219-231*. https://doi.org/10.17163/ret.n26.2023.03

Bux, S. and Van Vuuren, J. (2019). The effect of entrepreneurship education programmes on the development of self-efficacy, entrepreneurial intention and predictions for entrepreneurial. *Acta Commercii, 19(2), 1-13*. https://doi.org/10.4102/ac.v19i2.615

Cao, Z. and Shi, X. (2021). A systematic literature review of entrepreneurial ecosystems in advanced and emerging economies. *Small Business Economics, 57*, 75-110. https://doi.org/10.1007/s11187-020-00326-y

Distanont, A. and Khongmalai, O. (2020). The role of innovation in creating a competitive advantage. *Kasetsart Journal of Social Sciences, 41*(1), 15-21. https://doi.org/10.1016/j.kjss.2018.07.009

Elia, G., Margherita, A. and Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change, 150*, 119791. https://doi.org/10.1016/j.techfore.2019.119791

Feola, R., Vesci, M., Botti, A. and Parente, R. (2019). The determinants of entrepreneurial intention of young researchers: Combining the theory of planned behavior with the triple Helix model. *Journal of Small Business Management, 57*(4), 1424-1443. https://doi.org/10.1111/jsbm.12361

Ferreira, J., Coelho, A. and Moutinho, L. (2020). Dynamic capabilities, creativity and innova-

tion capability and their impact on competitive advantage and firm performance: The moderating role of entrepreneurial orientation. *Technovation, 92*, 102061. https://doi.org/10.1016/j.technovation.2018.11.004

Fragoso, R., Rocha-Junior, W. and Xavier, A. (2020). Determinant factors of entrepreneurial intention among university students in Brazil and Portugal. *Journal of Small Business & Entrepreneurship, 32*(1), 33-57. https://doi.org/10.1080/08276331.2018.1551459

Gielnik, M. M., Bledow, R. and Stark, M. S. (2020). A dynamic account of self-efficacy in entrepreneurship. *Journal of Applied Psychology, 105*(5), 487-505. https://doi.org/10.1037/apl0000451

Hervé, A., Schmitt, C. and Baldegger, R. (2021). Digitalization, entrepreneurial orientation & internationalization of micro-, small-, and medium-sized enterprises. *Technology Innovation Management Review, 10*(4), 5-17. http://doi.org/10.22215/timreview/1343

Hwang, W.-S., Choi, H.. and Shin, J. (2020). A mediating role of innovation capability between entrepreneurial competencies and competitive advantage. *Technology Analysis & Strategic Management, 32*(1), 1-14. https://doi.org/10.1080/09537325.2019.1632430

Jafari-Sadeghi, V., Garcia-Perez, A., Candelo, E. and Couturier, J. (2021). Exploring the impact of digital transformation on technology entrepreneurship and technological market expansion: The role of technology readiness, exploration and exploitation. *Journal of Business Research, 124*, 100-111. https://doi.org/10.1016/j.jbusres.2020.11.020

Jawad, M., Naz, M. and Maroof, Z. (2021). Era of digital revolution: Digital entrepreneurship and digital transformation in emerging economies. *Business Strategy & Development, 4*(3), 220-228. https://doi.org/10.1002/bsd2.145

Kumar, J. A., Bervell, B., Annamalai, N. and Osman, S. (2020). Behavioral intention to use mobile learning: Evaluating the role of self-efficacy, subjective norm, and WhatsApp use habit. *IEEE Access, 8*, 208058-208074. https://doi.org/10.1109/ACCESS.2020.3037925

Liang, R., Ye, Z., Zhang, J., Shi, L., Shen, Z. and Du, W. (2023). Continued participation in crowdsourcing innovation: the role of web-specific computer self-efficacy. *IEEE Access, 11*, 100309-100322. https://doi.org/10.1109/ACCESS.2023.3314331

Martínez-Gregorio, S., Badenes-Ribera, L. and Oliver, A. (2021). Effect of entrepreneurship education on entrepreneurship intention and related outcomes in educational contexts: A meta-analysis. *The International Journal of Management Education, 19*(3), 100545. https://doi.org/10.1016/j.ijme.2021.100545

Palmié, M., Miehé, L., Oghazi, P., Parida, V. and Wincent, J. (2022). The evolution of the digital service ecosystem and digital business model innovation in retail: The emergence of meta-ecosystems and the value of physical interactions. *Technological Forecasting and Social Change, 177*, 121496. https://doi.org/10.1016/j.techfore.2022.121496

Ratten, V. and Usmanij, P. (2021). Entrepreneurship education: Time for a change in research direction? *The International Journal of Management Education, 19*(1), 100367. https://doi.org/10.1016/j.ijme.2020.100367

Rippa, P. and Secundo, G. (2019). Digital academic entrepreneurship: The potential of digital technologies on academic entrepreneurship. *Technological Forecasting and Social Change, 146*, 900-911. https://doi.org/10.1016/j.techfore.2018.07.013

Schmidt, T., Braun, T. and Sydow, J. (2019). Copying routines for new venture creation: how replication can support entrepreneurial innovation *Routine dynamics in action: Replication and transformation* (pp. 55-78): Emerald Publishing Limited. https://doi.org/10.1108/S0733-558X20190000061004

Sedej, T. (2019). The role of video marketing in the modern business environment: a view of top management of SMEs. *Journal for International Business and Entrepreneurship Development, 12*(1), 37-48. https://doi.org/10.1504/JIBED.2019.103388

Shaikh, F., Afshan, G., Anwar, R. S., Abbas, Z. and Chana, K. A. (2023). Analyzing the impact of artificial intelligence on employee productivity: the mediating effect of knowledge sharing and well-being. *Asia Pacific Journal of Human Resources, 61*(4), 794-820. https://doi.org/10.1111/1744-7941.12385

Shu, Y., Ho, S.-J. and Huang, T.-C. (2020). The development of a sustainability-oriented creativity, innovation, and entrepreneurship education framework: a perspective study. *Frontiers in Psychology, 11*, 1878. https://doi.org/10.3389/fpsyg.2020.01878

Shwetzer, C., Maritz, A. and Nguyen, Q. (2019). Entrepreneurial ecosystems: a holistic and dynamic approach. *Journal of Industry-University Collaboration, 1*(2), 79-95. https://doi.org/10.1108/JIUC-03-2019-0007

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Tomy, S. and Pardede, E. (2020). An entrepreneurial intention model focussing on higher education. *International Journal of Entrepreneurial Behavior & Research, 26*(7), 1423-1447. https://doi.org/10.1108/IJEBR-06-2019-0370

Towers, N., Santoso, A. S., Sulkowski, N. and Jameson, J. (2020). Entrepreneurial capacity-building in HEIs for embedding entrepreneurship and enterprise creation–a tripartite approach. *International Journal of Retail & Distribution Management, 48*(8), 881-899. https://doi.org/10.1108/IJRDM-06-2019-0185

Udayanan, P. (2019). The role of self-efficacy and entrepreneurial self-efficacy on the entrepreneurial intentions of graduate students: A study among omani graduates. *Entrepreneurial Business and Economics Review, 7*(4), 7-20. https://bit.ly/49LKnEh

Volberda, H. W., Khanagha, S., Baden-Fuller, C., Mihalache, O. R. and Birkinshaw, J. (2021). Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms. *Long Range Planning, 54*(5), 102110. https://doi.org/10.1016/j.lrp.2021.102110

Wang, X., Sun, X., Liu, S. and Mu, C. (2021). A preliminary exploration of factors affecting a university entrepreneurship ecosystem. *Frontiers in Psychology, 12*, 732388. https://doi.org/10.3389/fpsyg.2021.732388

Witschel, D., Döhla, A., Kaiser, M., Voigt, K.-I. and Pfletschinger, T. (2019). Riding on the wave of digitization: Insights how and under what settings dynamic capabilities facilitate digital-driven business model change. *Journal of Business Economics, 89*, 1023-1095. https://doi.org/10.1007/s11573-019-00950-5

Yousaf, U., Ali, S. A., Ahmed, M., Usman, B. and Sameer, I. (2021). From entrepreneurial education to entrepreneurial intention: a sequential mediation of self-efficacy and entrepreneurial attitude. *International Journal of Innovation Science, 13*(3), 364-380. https://doi.org/10.1108/IJIS-09-2020-0133

Zahra, S. A., Liu, W. and Si, S. (2023). How digital technology promotes entrepreneurship in ecosystems. Technovation*, 119, 102457*. https://doi.org/10.1016/j.technovation.2022.102457

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.97-109
https://doi.org/10.17163/ret.n27.2024.07

PLS-SEM for online shopping intention in the fashion sector in Ecuador

Modelo PLS-SEM para la intención de compra online en el sector moda en Ecuador

Vasilica Maria Margalina
Professor at CESINE Centro Universitario de Santander, Spain
vasilicamaria.margalina@campuscesine.com
https://orcid.org/0000-0002-8479-8966

Álvaro Jiménez-Sánchez
Professor at Universidad de Valladolid, Spain
alvarojs@uva.es
https://orcid.org/0000-0002-4249-8949

Alberto Magno Cutipa-Limache
Professor at Universidad Nacional de Altiplano de Puno, Peru
acutipa@unap.edu.pe
https://orcid.org/0000-0001-8584-6424

Received on: 15/01/24 **Revised o**n: 05/02/24 **Approved** on: 20/02/24 **Published** on: 01/04/24

Abstract: E-commerce in the fashion sector has increased in recent years in Latin America, especially in the wake of the pandemic, however, there are still issues in the acceptance of this shopping channel. The present research focuses on some factors that could influence purchase intention and aims to test how it is influenced by trust, perceived risks, costs and convenience. For this purpose, a questionnaire was given to 223 students from four universities in Ecuador. A PLS-SEM model was developed for the analysis of the data, in which trust in the seller has a mediating role in the relationship between the other three factors and purchase intention. Results show that this model has acceptable predictive and explanatory power. Likewise, it validates that risks, convenience and trust significantly affect intention, but not costs. In addition, trust would mediate the relationship between the other variables and online shopping intention. It is concluded that the proposed model can serve as a basis for similar studies, and, at the same time, it is considered that the results obtained can be used by business in the fashion sector that pursue to sell through e-commerce platforms for marketing strategies development.

Keywords: E-commerce, fashion, trust, convenience, shopping intention, perceived risks, PLS-SEM, costs.

Resumen: el comercio electrónico del sector de la moda ha aumentado en los últimos años en Latinoamérica, especialmente a raíz de la pandemia, sin embargo, todavía existen problemas en la aceptación de este canal de compra. La presente investigación se centra en algunos factores que podrían influir en la intención de compra y tiene como objetivos comprobar cómo en ella influyen la confianza, los riesgos percibidos, los costos y la conveniencia. Para esto, se suministró un cuestionario a 223 estudiantes de cuatro universidades del Ecuador. Para el análisis de los datos obtenidos se desarrolló un modelo PLS-SEM, en el cual la confianza en el vendedor actúa como variable mediadora en la relación entre los otros tres factores y la intención de compra. Los resultados muestran que dicho modelo tiene un aceptable poder predictivo y explicativo. Asimismo, se comprueba que los riesgos, la conveniencia y la confianza afectan significativamente a la intención de compra, pero no los costos. Además, la confianza mediaría la relación entre las tres variables y la intención de compra en línea. Se concluye que el modelo propuesto puede servir de base para estudios similares y, a su vez, se considera que los resultados obtenidos pueden ser utilizados por las empresas en el sector de la moda que quieren vender a través de plataformas de e-Commerce para el desarrollo de estrategias de marketing.

Palabras clave: comercio electrónico, confianza, conveniencia, intención de compra, moda, riesgos percibidos, PLS-SEM, costos.

Suggested citation: Margalina, V. M., Jiménez-Sánchez, Á. and Cutipa-Limache, A. M. (2024). PLS-SEM for online shopping intention in the fashion sector in Ecuador. *Retos Revista de Ciencias de la Administración y Economía*, *14*(27), 97-109. https://doi.org/10.17163/ret.n27.2024.07

Introduction

The first virtual stores in Latin America appeared in the 1990s, specifically in Argentina, Mexico and Brazil. Since the 2000s, the rise of the Internet and the development of secure payment systems has led e-Commerce to expand in these territories (Sanabria-Díaz *et al.*, 2016). In turn, smartphones and the increase in sales through digital social networks promoted this Latin American e-commerce (Seville-Avilés, 2021), becoming even more popular thanks to the convenience and ease of finding products with better prices than in traditional stores (Soler-Patiño, 2016). However, there are still challenges for electronic sales, such as low credit card penetration, complex customs processes and high prices (Skypostal, 2019; Cámara peruana de comercio electrónico, 2021).

The boom of e-Commerce worldwide occurred during the pandemic because buying products in many physical stores was very complicated. Latin America was no exception and despite the low penetration of E-Commerce in the region, during COVID-19, it reached expected figures for 2030 (Boyle, 2021). Thus, although irregularly, in many countries of the region there was a total increase in e-Commerce of 37% in 2020, although it reduced again in 2022 due to the return of regular activity in physical stores and the increase in inflation (Chevalier, 2021, 2023). Argentina, Colombia and Peru are the countries that recorded the highest growth (Chevalier, 2023), but *Ecuador also stands out with increases of more than 30%* in e-Commerce revenues (CITEC, 2023).

The fashion sector has also developed strongly, with Brazil, Mexico, Colombia and Argentina being the predominant markets, with extensive online offers and brands both local and highly recognized worldwide (Dos Reis and Machado, 2020; Brooksworth *et al.*, 2022; Meneses, 2023). Some of the aspects that have facilitated this have been the increase in the use of smartphones and virtual social networks; platforms almost forced by fashion brands that want to reach consumers *optimally* and more widely. In this sense, e-Commerce has meant that many companies reach a large audience, sometimes to areas or countries where they do not have a *physical* store, *which has led* to increased opportunities for higher income and, for consumers, greater access and product diversification. In addition, technological development and the growth of the internet have allowed the consumer to see and buy products without having to travel to physical stores, which has caused companies to rethink their marketing strategies (Rosário and Raimundo, 2021). Technological advances have allowed the improvement of interactivity and the consumer experience, which has resulted in marketing and business strategies that benefit both consumers and companies (Joshi, 2013).

There are many factors that affect the intentions and behavior of consumers in e-Commerce. These factors include technological, economic, demographic, cultural, and individual psychological factors (Venkatesh *et al.*, 2022). E-commerce companies should consider these factors when designing their marketing strategies, although not all have the same relevance. Likewise, taking into account the uncertainties and risks involved in online business, consumers pay attention to the security and usability of the website, services, convenience, prices, trust and the variety of products (Chiang *et al.*, 2018).

In this sense, this research includes three variables to be taken into account, such as perceived risks, convenience and costs, which are shown as components to be considered in the online purchase decisions of the consumer, especially in this fashion sector (Margalina and Cutipa-Limache, 2023). In addition to the general disadvantages inherent in e-Commerce, there are also aspects such as the visual and emotional nature of the products, the personal subjectivity in decision-making, the variability of sizes and adjustments, the cycles and trends in this area, the perceived values (exclusivity, quality, identity or reputation of the brand, etc.), the return processes of some garments or marketing strategies used especially in this field such as *influencers* or virtual and augmented reality tests so that consumers can visualize how they would look with these products (Escobar-Rodríguez and Bonsón-Fernández, 2017; Guercini *et al.*, 20 18; Miglani-Neha, 2022). Hence, the need to contrast these three variables of great relevance in online

print ISSN: 1390-6291; electronic ISSN: 1390-8618

shopping. In addition, trust, which represents a key determinant of consumer behavior and purchase intention in e-Commerce (Venkatesh *et al.*, 2022; Hamid and Sujood, 2023), as well as the main barrier to this type of trade in Latin America (Pena-Alcaraz, 2023).

Risks, convenience, perceived costs and purchase intent in E-Commerce

The intention to purchase is defined as the degree of probability that the customer will buy a service or product soon and represents the most important barrier to e-Commerce development (Imtiaz *et al.*, 2019), especially in Latin America (Margalina and Cutipa-Limache, 2023). According to the theory of reasoned and planned action of Azjen (1991), its importance lies in its relevance as a determinant of consumer behavior. Among the most studied factors influencing intent are time, convenience, costs, and perceived risks (Cunningham and De Meyer-Heydrinch, 2018; Thomas *et al.*, 2018; Yu *et al.*, 2018; Mousa, 2021; Qalati *et al.*, 2021).

An e-Commerce store must take into account attributes, such as costs and perceived convenience (Cunningham and De Meyer-Heydrinch, 2018). The costs do not refer only to the price paid for the product, but also to the travel expenses incurred when buying the product in a physical store, as well as the delivery costs (Margalina and Cutipa-Limache, 2023). Consumers want online shopping channels that make it easier for them to search for products and product-related information, which represent the main dimensions of convenience. Therefore, convenience is a relevant factor in the selection of the purchase channel, especially in e-Commerce (Cunningham and De Meyer-Heydrinch, 2018; Venkatesh *et al.*, 2022). Empirical studies show that convenience positively affects purchase intent (Cunningham and De Meyer-Heydrinch, 2018; Singh *et al.*, 2019; Margalina and Cutipa-Limache, 2023). However, in the case of the cost effect, the results differ. Sohn and Kim (2020) found that these positively affect purchase intent, as a result of companies' efforts to reduce costs linked to the online purchasing process. In contrast, the results of the Cunningham and Meyer-Hendrich (2018) and Margalina and Cutipa-Limache (2023) studies contradict this finding by finding no significant cost effects.

One of the most frequently applied theories to understand consumer behavior in e-Commerce is the Perceived Risk Theory (Mohseni *et al.*, 2018). This theory states that perceived risks affect consumers' purchasing decisions (Taylor, 1974). Several empirical studies have found a significant effect of perceived risks on purchase intent in e-Commerce stores (Mohseni *et al.*, 2018; Qalati *et al.*, 2019; Venkatesh *et al.*, 2022). The perceived risks become more relevant for the fashion sector, due to the greater risk that the size of the product purchased does not correspond to the required one (Iqbal *et al.*, 2019; Singh *et al.*, 2019; Margalina and Cutipa-Limache, 2023).

The results of the empirical studies point to the need to further investigate the effect of these factors on the purchase intention and, therefore, the following hypotheses are proposed:

H_1: A high level of perceived convenience positively affects the intention to buy online.

H_2: A low level of perceived costs positively affects the intention to buy online.

H_3: A low level of perceived risks positively impacts the intention to buy online.

Trust as a key determinant of purchase intent in e-Commerce

Although there is little rigorous research on this in Latin America, these place trust as a major factor in their development of e-Commerce, because despite the increase in buyers, much of the public does not trust online payments and the level of security of these websites (personal and financial data, frauds, virtual scams, etc.) (Gómez-Gómez, 2017; Suominen, 2019), which has led companies in the sector to seek to improve transparency and security in these business processes (Peña-Alcaraz, 2023).

Confidence is closely related to perceived risks (Zhu *et al.*, 2011) and both variables would mediate and moderate the effect of shoppers' perception of online store characteristics and purchase intention (Qalati *et al.*, 2021). Other studies also highlight the contribution of trust to the success of marketing strategies aimed at achieving a favorable purchase intention by the consumer (Manzoor *et al.*, 2020). In addition, some researchers have demonstrated the significant relationship between seller trust and online shopping behavior (Zhao *et al.*, 2019), so subsequent studies have included it within the theory of reasoned and planned action in the context of e-Commerce (Hamid and Sujood, 2023). Thus, trust presents as one of the key determinants of the purchase intention in e-Commerce and, therefore, the following hypotheses are proposed:

H_4: A high level of trust positively affects the intention to buy online.

H_5: Confidence mediates the relationship between convenience and purchase intention.

H_6: Confidence mediates the relationship between costs and purchase intention.

H_7: Confidence mediates the relationship between risks and purchase intention.

Given the relevance of the subject and the scarcity of research in the Andean region with more analytical and quantitative character, this research has as main objective to contribute to theories about seller confidence and consumer behavior in the e-Commerce of the fashion sector. To this end, a model will be proposed to evaluate the contribution of convenience, costs and perceived risks to the favorable response of consumers of the fashion sector in Ecuador in terms of purchase intention. In addition, the role of trust as a vehicle that conveys the effects of these factors on the intention to buy online will be evaluated.

The results will allow companies to know better the functioning of the consumer to adapt and refine their marketing strategies in the field of increasingly booming e-commerce.

Materials and method

To perform the analysis, a PLS-SEM structural equations model was developed using SmartPLS 4 software (Ringle *et al.*, 2022). This analysis technique was chosen due to its good results with small samples and with a non-normal distribution and behavior of the data, as well as the objective of research prediction (Margalina *et al.*, 2023). The evaluation of the structural model and the measurement model was carried out according to the recommendations of Hair *et al.* (2022); while the guidelines of Ringle *et al.* (2023) were followed for the analysis of the predictive and explanatory power of the model.

The sample is made up of 223 students from four universities in Ecuador, specifically, data have been collected from two universities in the Sierra region (Technical University of Ambato and University of the Armed Forces) and two from the Coast (State Technical University of Quevedo and Technical University of Machala). A sample of students was selected because this type of population has a higher degree of homogeneity, which reduces the effect of differences in age, education, socioeconomic level and work experience on outcomes (Schlägel and Sarstedt, 2016). In addition, the technique of non-probabilistic sampling was applied for convenience for selecting the sample. The results of the software G*Power (Faul *et al.*, 2009) indicate that the sample of 223 students allows to reach a statistical power of 95%, an effect size (f^2) of 0.059 to a significance level of 0.05 (two tails), which is in accordance with the objectives of the study.

The data for the analysis was collected through a survey distributed online to undergraduate students in Ecuador by a teacher. It was implemented during the period April-July 2022. Responses were anonymous and without financial reward to ensure data confidentiality. For the survey, a structured questionnaire was used that contained questions for the characterization of the sample and the measurement of the five variables included in the PLS-SEM model: confidence, risks, convenience, costs and purchase intention. All items included in the questionnaire to measure the five variables had 5-point Likert response options, depending on the degree of disagreement

print ISSN: 1390-6291; electronic ISSN: 1390-8618

or agreement. The items of the questionnaire were adapted by those proposed in the literature (Table 1) and focused on the online purchase of fashion products.

Table 1
Questionnaire items

Variable		Item	Author(s)
Trust	Conf1	The seller(s) is/are honest	Gefen *et al.* (2003)
	Conf2	I know that the seller(s) cares about consumers	
	Conf3	I know the seller(s) is/are opportunistic	
Convenience	Conv1	It is relatively easy	Cunningham and De Meyer-Heydenrych (2018)
	Conv2	It simplifies my purchases	
	Conv3	It is convenient to find information about a product	
Costs	Cost1	It gives me better control of my expenses	
	Cost2	It allows me to find the best value for money when comparing products	
	Cost3	It allows me to find better prices	
	Cost4	It encourages me to pay any cost for a single product	
	Cost5	It means that the cost of the product is ultimately cheaper	
Risks	Risk1	It may result in the product being delivered without damage	
	Risk2	It results in timely delivery of purchases	
	Risk3	It leads to the product matching the description being delivered	
	Risk 4	It makes me feel safe as the credit card information I provide is confidential	
	Risk5	It means that I will not suffer a significant financial loss when making a transition	
Purchase intention	Intention1	I am willing to use my credit card to buy fashion products online	Ling *et al.* (2010)
	Intention2	I will most likely buy fashion products online	
	Intention3	I am willing to buy fashion products online again in the future	

Regarding the characteristics of the sample, there is a higher proportion of women (74%), as well as an average age of 22.1 years. In addition, 86.1% of respondents have made online purchases. Only 6.7% frequently buy fashion products in online stores, 22% do so on an occasional basis, 51.1% rarely and 13.9% never.

Results

Based on the recommendations of Hair *et al.* (2022) for the evaluation of the reflective measurement model that was used for the five variables of the PLS-SEM model, the measures for internal reliability, convergent validity and discriminant validity were analyzed (Table 2 and 3). The assessment of internal reliability begins with the analysis of the loads of the indicators, which must exceed the minimum value of 0.708. As can be seen in Table 2, all indicators exceed this value.

Table 2
Reliability and validity of constructs

Construct	Indicator	Load	Cronbach's alpha	Compound reliability (ρA)	Reliability (ρC)	AVE
Trust	Conf1	0,909**	0,881	0,881	0,927	0,808
	Conf2	0,914**				
	Conf3	0,873**				
Convenience	Conv1	0,933**	0,917	0,917	0,948	0,858
	Conv2	0,932**				
	Conv3	0,913**				
Costs	Cost1	0,866**	0,904	0,906	0,929	0,722
	Cost2	0,845**				
	Cost3	0,860**				
	Cost4	0,827**				
	Cost5	0,851**				
Risks	Risk1	0,758**	0,855	0,859	0,896	0,791
	Risk2	0,817**				
	Risk3	0,805**				
	Risk4	0,789**				
	Risk5	0,808**				
Purchase intention	Intention1	0,792**	0,865	0,859	0,896	0,633
	Intention2	0,937**				
	Intention3	0,931**				

**p<0,01

To complete the internal reliability assessment, the Cronbach Alpha and composite reliability measurements (rA and rA) are analyzed. The values exceed the threshold of 0.70 for both measures and for all constructs. For their part, the assessment of convergent validity is based on the values of the AVE, which are in all cases higher than the minimum required level of 0.50. Therefore, the measurements of the five reflective constructs have high levels in terms of internal reliability and convergent validity. It should be noted that, due to unreliability, some items for measuring convenience, costs and risks were excluded from those proposed by Cunningham and De Meyer-Heydenrych (2018).

Next, it is evaluated whether the measures of the reflective constructs show discriminating validity at the empirical level. For this purpose, the heterotrait-monotrait ratio (HTMT) was chosen as the most reliable criterion to determine the discriminant validity (Ringle *et al.*, 2023).

Table 3
Discriminant Validity (HTMT)

	Original sample (O)	Sample mean (M)	5.0 %	95.0 %
Convenience ↔ Trust	0,684	0,683	0,593	0,765
Costs ↔ Trust	0,709	0,708	0,622	0,785
Costs ↔ Convenience	0,795	0,794	0,718	0,861
Trust ↔ Purchase intention	0,693	0,692	0,593	0,783

print ISSN: 1390-6291; electronic ISSN: 1390-8618

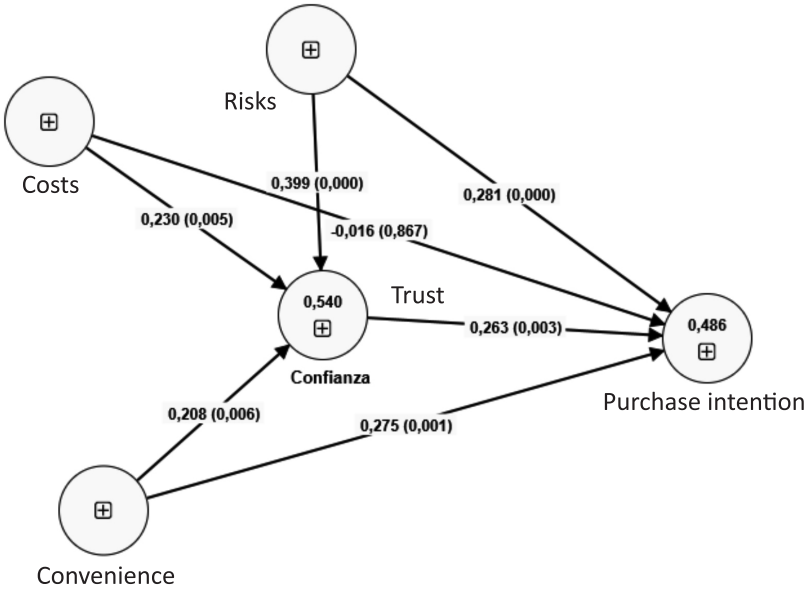
	Original sample (O)	Sample mean (M)	5.0 %	95.0 %
Convenience ↔ Purchase intention	0,656	0,655	0,557	0,743
Costs ↔ Purchase intention	0,592	0,591	0,474	0,699
Risks ↔ Confidence	0,770	0,770	0,682	0,849
Risks ↔ Convenience	0,682	0,682	0,577	0,770
Risks ↔ Costs	0,719	0,719	0,629	0,802
Risks ↔ Purchase intention	0,711	0,710	0,620	0,792

The HTMT values, which are presented in the 'Original sample (O)' column of Table 3, are below the most conservative maximum level of 0.85 (Henseler *et al*., 2015). In the case of the Costs and Convenience variables, it is observed that the upper limit of the confidence interval (95.0 %) exceeds this level. However, its HTMT value of 0.861 is less than the value 0.90, which represents the maximum limit for conceptually similar constructs (Hair *et al*., 2022). This is the case for the two variables, which represent two dimensions of online store attributes, along with costs, time and service, according to Cunningham and De Meyer Heydenrych (2018). The time and service variables were also included in the measurement instrument, but due to the lack of internal validity and discrimination were removed from the model. Therefore, the reliability and validity of the constructs are reviewed.

The next step is the evaluation of the structural model, which begins with the evaluation of the multicollinearity, explanatory power and predictive power of the proposed model. In the case of multicollinearity, none of the VIF values exceed the recommended value of 3,000 (Hair *et al*., 2022); therefore, this problem was not identified for the proposed structural model (Figure 1).

As seen in Figure 1, the values of R2, which are inserted in the circles representing the model variables in the graph, reach values of 0.540 and 0.486, respectively. In addition, all R2 values are statistically significant. Therefore, the model has explanatory power. The SRMR value of 0.063, which is lower than the maximum level of 0.08 (Hair *et al*., 2022) also confirms that the proposed model has explanatory power.

Figure 1
Path coefficients and R^2 values of the proposed model



Predictive power was evaluated with the help of techniques recommended by Ringle *et al.* (2023), PLSpredict and CVPAT. The PLSpredict method was proposed by Shmueli *et al.* (2019) and bases the predictive power analysis on the Q^2 predict, RMSE and MAE measures. The values of these measures for the dependent variable of the proposed model and Purchase intention are found in table 4.

Table 4
Results PLSpredict purchase intention

Indicator	Q^2 predict	PLS-SEM RMSE	PLS-SEM MAE	LM RMSE	LM MAE
Intention 1	0,241	0,917	0,731	0,910	0,694
Intention 2	0,404	0,728	0,562	0,745	0,569
Intention 3	0,375	0,814	0,605	0,848	0,630

The values of the Q^2 predict exceed in all cases value 0, therefore, the proposed model has predictive power. The RMSE and MAE values obtained by applying PLS-SEM are higher than the results of linear regression (LM) in most cases. The only exception is observed in the Intention 1 indicator. This result shows that the model has average power to predict the variable purchase intention (Shmueli *et al*., 2019).

The CVPAT technique or predictive ability test with cross-validation, presented by Liengaard *et al*. (2021), compares the predictive loss of PLS-SEM and LM at two levels. The results of the application of this test for the proposed model are set out in Table 5.

Table 5
CVPAT Results

	PLS-SEM vs. Mean Indicators (IA)				PLS-SEM vs. Linear Model (LM)			
	Loss PLS	Loss LM	Mean	Valor *t*	Pérdida PLS	Pérdida LM	Diferencia media de pérdida	Valor *t*
Trust	loss difference	Value t	Loss PLS	Loss LM	Mean loss difference	Value t	-0,043	2,904**
Purchase intention	0,677	1,018	-0,341	4,610**	0,677	0,700	-0,025	1,143
General	0,601	0,959	-0,358	5,471**	0,601	0,633	-0,031	2,529*

**p<0,01, *p<0,05

In both reports generated from the application of the CVPAT procedure, PLS-SEM vs. Mean Indicator (IA) and PLS-SEM vs. Linear Model, a negative mean loss difference value is obtained. In addition, the p-value is less than 0.05 in all cases in the first report and in most cases in the second report. Therefore, the predictability of PLS-SEM is significantly higher than that of IA and LM parameters.

The significance and relevance of the structural model relationships were evaluated based on the guidelines of Hair *et al.* (2022). The significance of the *path* coefficients was determined with the help of the bootstrapping procedure, with 10,000 bootstrap samples, the Percentile bootstrap method for the confidence interval, two-tailed test at a significance level of 0.05. The relevance was determined using the *path* coefficients, the values of R^2 and the size of the f^2 effect.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Table 6
Results and validation of hypotheses

	Hypothesis	Path coefficient	SD	Value t	2.5 %	97.5 %
	Direct effects					
H_1	Convenience → Purchase intention	0,273	0,080	3,446**	0,135	0,400
H_2	Costs → Purchase intention	-0,016	0,098	0,168	-0,178	0,142
H_3	Risks → Purchase intention	0,281	0,075	3,761**	0,156	0,403
H_4	Trust → Purchase intention	0,263	0,087	3,001**	0,126	0,413
	Specific indirect effects					
H_5	Convenience → Confidence → Purchase intention	0,055	0,028	1,938*	0,019	0,116
H_6	Costs → Trust →Purchase intention	0,060	0,028	2,184*	0,025	0,120
H_7	Risks → Confidence → Purchase intention	0,105	0,044	2,386**	0,044	0,189
	Total effectl					
H_5	Convenience → Purchase intention	0,329	0,074	4,453**	0,201	0,445
H_6	Costs → Purchase intention	0,044	0,093	0,474	-0,107	0,197
H_7	Risks → Purchase intention	0,385	0,071	5,431**	0,263	0,496

**p<0,01, *p<0,05

The results show that out of the two attributes of the purchase channel, only Convenience significantly affects the Purchase Intention, with a positive path coefficient of 0.273 (t = 3.446, p<0.01), a low effect f2 size of 0.062. Risks represent another variable with a positive and significant effect of 0.281 (t = 3.761; p<0.01) and the largest size of the f2 effect by a model-independent variable of 0.071. These results validate H1 and H3. Therefore, the relevance of the Convenience and Risks for the intention to buy online in the fashion sector observed in previous studies is confirmed (Iqbal *et al*., 2019; Singh *et al*., 2019; Margalina and Cutipa-Limache, 2023).

In contrast, Costs have a negative path coefficient of -0.016 (t = 0.168, p>0.05), but without statistical significance and without any effect, as indicated by the f2 value of 0.00. Therefore, H2 is not validated, in line with the results found in the studies of Cunningham and De Meyer-Hendrich (2018) and Margalina and Cutipa-Limache (2023).

Confidence also positively and significantly affects the purchase intention, with a path coefficient of 0.263 (t = 3.001; p<0.01) and the same size of the f2 effect as the Convenience of 0.062. Therefore, H4 is also validated. In this way, trust is revealed as a relevant factor in purchasing decisions in e-Commerce, as in previous studies by Manjoor *et al*. (2020), Venkatesh *et al*. (2022) and Hamid and Sujood (2023).

However, Trust also serves as a vehicle for the indirect effects of store attributes and risks on the Purchase Intention. This is demonstrated by the results of the mediation effects analysis. Specifically, the Convenience affects positively and significantly the purchase intention through the Trust of 0.055 (t = 1.938; p<0.05). Mediation is complementary and partial because both direct and indirect effects of Convenience are significant and positive, with an effect size of the explained variance (VAF) of 20.14%. In the case of costs, the mediation is complete, because only the indirect effect has statistical significance, with a positive path coefficient of 0.060 (t = .938; p<0.05). Therefore, both hypotheses that propose the mediation of Confidence between the effects of the attributes and the purchase intention, H5 and H6, are validated. Hence, perceived costs become a relevant factor in marketing strategies in contexts of low consumer confidence, as occurs in Latin American countries (Latinobarómetro, 2023). Furthermore, these results highlight once again the important role of trust in online purchasing decisions because in addition to the direct effect

on the purchase intention, they also mediate the effect of consumer perceptions on the attributes and risks of the store (Qalati *et al*., 2021).

The indirect effect of the risks is even greater than that of the two attributes of the sales channel, with a positive and significant path coefficient of 0.105 ($t = 2.386$; $p<0.05$). This is also a complementary mediation because, as the H3 validation showed, the effect is also positive and significant. The BAT value of 37.36%, which is in the range of 20% to 80%, indicates partial mediation (Nitzl *et al*., 2016). Therefore, the results demonstrate that confidence is a factor of paramount importance for the intention to buy products from the fashion sector, according to the studies conducted by Zhao *et al*. (2019), Hamid and Sujood (2023) and Margalina and Cutipa Limache (2023).

The R2 values indicate that the direct and indirect effects of the four variables of the proposed model explain 48.6 % of the variation of the purchase intention. However, it notes that Convenience, Costs and Risks account for 54% of the variance in Seller Confidence. This can be explained by the large number of factors involved in the consumer decision process in e-Commerce. These include the channels used for marketing, the popularity and familiarity of the seller's brand, as well as the services offered to assist purchase on the sales platform (Cunningham and De Meyer-Hendrich, 2018; Rosário and Raimundo, 2021).

Conclusions

This research demonstrates the key role of trust for e-Commerce in the fashion sector of Ecuador because it has significant effects on the intention to buy. Since this last variable precedes behavior, the findings can be very useful for companies to evaluate, develop and improve their marketing strategies and, with it, improve the confidence of their consumers, such as, for example, influencing good transparency, product quality, exceptional level of customer service, respect for privacy, community participation, feedback and testimonials by consumers, clear guarantees and returns, consistent external communication, continuous innovation, loyalty programs or training staff to interact and solve customer problems. In this sense, new social media channels offer opportunities for relational marketing, which results in higher levels of trust and loyalty.

In addition, it is observed that the risks and convenience do correlate significantly with the intention to purchase. In this sense, companies can reduce risks, for example, by reporting products in detail, using high-quality images, with timely return policies, also with customer reviews and testimonials, ensuring their personal information with transparent privacy policies, adding quality tests with live chat and effective customer service or tracking orders. While they can increase convenience with strategies such as easy web browsing, simplifying purchasing processes and return policy, with flexible payment options, making fast delivery and tracking options, with loyalty, subscription and reward programs, increasing personalization and recommendations, with efficient customer service, with a quality mobile application or with fashion style guides and detailed sizes to reduce the likelihood of returns due to incorrect measures

This could be because fashion is often subjective and personal in nature, where some consumers may be willing to pay more for items they consider exclusive or high quality, regardless of the absolute cost. Thus, this perceived value would cause certain customers to be willing to invest more in garments that they consider valuable in terms of style, brand, trend or exclusivity. In addition, it is worth mentioning that some of these purchases respond to emotional issues, personal expression, social image or identification with a brand, which could exceed the consideration of costs in making purchasing decisions. In turn, the shopping experience could be a factor that overshadows costs, as buyers can appreciate more aspects such as convenience, ease of browsing on the web, customer service or the possibility of easy returns. However, the costs must be taken into account when improving trust, because, in this way, companies can increase the efficiency of their marketing campaigns.

Finally, on the last hypotheses raised, it is shown that trust acts as a mediator between the

print ISSN: 1390-6291; electronic ISSN: 1390-8618

variables risks and convenience. The important role of trust as a vehicle for channeling marketing efforts in order to obtain favorable responses from consumers in terms of purchase intention is therefore confirmed. Therefore, in addition to applying the strategies discussed above, business organizations in this sector should focus their marketing activities towards achieving positive perceptions in consumers regarding the risks, convenience and costs to improve confidence in the seller and, in this way, increase the effects on the purchase intention.

Regarding the methodology used, it has shown to be acceptable and with good results. However, it is considered that the proposed model is only a basis on which to continue working, either adding or removing other variables as improving the items that compose them. In this sense, perhaps gender, age or sociocultural characteristics would be some factors that could moderate the variables studied. Therefore, it is appropriate to continue investigating these methodological pathways and, especially, to apply them to other sectors, in other samples and in other contexts or countries.

In conclusion, the research carried out contributes to the field of study about the factors that affect the use of online commerce in emerging economies such as Ecuador. The data extracted appeal to the future marketing campaigns of companies operating electronically in Latin America to gain the trust of customers with a series of previously analyzed components. Under this framework, it is expected that subsequent research will further delve into both the various factors that affect the purchase intention and other models that increase the explanatory and predictive power found in this study. In this way, and with more longitudinal and cross-cultural research, e-commerce can be improved for both sellers and consumers.

References

Azjen, I. (1991). The theory of planned behavior. Organizational. *Behavior and Human Decision Processes, 50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Boyle, T. C. (2021). *The E-Commerce boom coming in America Latina*. Lazar Fund Managers. https://bit.ly/3Oa3ZJs

Brooksworth, F., Mogaji, E. and Bosah, G. (2022). Fashion marketing in emerging economies volume II: South American, Asian and African perspectives. En *Fashion marketing in emerging economies volume II: South American, Asian and African perspectives* (pp. 3-16). Springer International Publishing. https://bit.ly/3I36s4X

Cámara Peruana de Comercio Electrónico. (2021). *Reporte oficial de la industria Ecommerce en Perú. Crecimiento de Perú y Latinoamérica 2009-2019*. Cámara peruana de comercio electrónico. https://bit.ly/491oboQ

Chevalier, S. (2021, 29 de septiembre). *E-commerce in Latin America – statistics & facts*. Statista. https://bit.ly/425SdW4

Chevalier, S. (2023, 31 de agosto). *E-commerce in Latin America – statistics & facts*. Statista. https://bit.ly/3UM1QaF

Chiang, L-P., Lin, C. and. and Huang, C. H. (2018). Measuring the effects of online-to-offline marketing. *Contemporary Management Research, 14*(3), 167-189. https://doi.org/10.7903/cmr.18462

CITEC. (2023). *Mapeo de del ecosistema E-Commerce en Ecuador*. Cámara de Innovación y Tecnología Ecuatoriana. https://bit.ly/3U4VTW4

Cunningham, N. and De Meyer-Heydenrich, C-F. (2018). Consumer perceptions of shopping channel attributes and risk factors of apparel purchase. *The Retail and Marketing Review, 14*(2), 28-42. https://bit.ly/3tWAvrx

Dos Reis, A. D. and Machado, M. A. (2020). E-commerce in Emerging Markets: internationalization factors of Brazilian footwear in South America. *Revista Gestão & Tecnologia, 20*(1), 116-140. https://bit.ly/3S5UcVJ

Escobar-Rodríguez, T. and Bonsón-Fernández, R. (2017). Analysing online purchase intention in Spain: fashion e-commerce. *Information Systems and e-Business Management, 15*, 599-622. https://doi.org/10.1007/s10257-016-0319-6

Faul, F., Erdfelder, E., Buchner, A. and Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1. Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Gefen, D., Karahanna, E. and Straub, D. T. (2003). Trust and TAM in Online Shopping: An Integrated Model. *MIS Quarterly, 27*(1), 51-90.

https://doi.org/10.2307/30036519
Gómez-Gómez, C. C. (2017). El comercio electrónico: incidencias y desafíos en el derecho del consumidor. *Revista científica Codex, 3*(5). https://bit.ly/3U4Wjf6
Guercini, S., Bernal, P. M. and Prentice, C. (2018). New marketing in fashion e-commerce. *Journal of global fashion marketing, 9*(1), 1-8. https://doi.org/10.1080/20932685.2018.1407018
Hair, J. F., Hult, G. T. M., Ringle, C. M. and Sarstedt, M. (2022). *A Primer on Partial Least Square Equation Modelling (PLS-SEM)* (3rd ed). Thousand Oaks, CA: Sage.
Hamid, S. and Sujood, M. A. (2023). Behavioral intention to order food and beverage items using e-commerce during COVID-19: an integration of theory of planned behavior (TBP) with trust. *British Food Journal, 125*(1), 112-131. https://doi.org/10.1108/BFJ-03-2021-0338
Henseler, J., Ringle, C. M. and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115-135. https://doi.org/10.1007/s11747-014-0403-8
Imtiaz, R., Ain Kamzi, Q., Amjad, M. and Aziz, A. (2019). The impact of social network marketing on consumer purchase intention in Pakistan: A study on female apparel. *Management Science Letters, 9*(7), 1093-1104.
https://doi.org/10.5267/j.msl.2019.3.015
Iqbal, W. (2019). Impact of perceived risk on customer's online purchase intention towards branded apparel. *Journal of Marketing Strategies, 1*(1), 38-62. https://doi.org/10.52633/jms.v1i1.3
Joshi, D. J. (2013). An analysis of the existing literature on B2C E-commerce. *Indian Journal of Marketing, 43*(12), 34-46. https://doi.org/10.17010/ijom/2013/v43/i12/80512
Latinobarómetro. (2023). https://bit.ly/423QQqM
Liengaard, B. D., Sharma, P. N., Hult, G. T. M., Jensen, M. B., Sarstedt, M., Hair, J. F. and Ringle, C. M. (2021). Prediction: Coveted, yet forsaken? Introducing a cross-validated predictive ability test in partial least squares path modelling. *Decision Sciences, 52*(2), 362-392. https://doi.org/10.1111/deci.12445
Ling, K. C., Chai, L. T. and Piew, T. H. (2010). The effects of shopping orientations, online trust and prior online purchase experience toward customers´ online purchase intention. *International Business Research, 3*(3), 63-76. https://doi.org/10.5539/ibr.v3n3p63
Manzoor, U., Baig, S. A., Hashim, M. and Sami, A. (2020). Impact of social media marketing on consumer's purchase intentions: the mediating role of customer trust. *International Journal of Entrepreneurial Research, 3*(2), 41-48. https://doi.org/10.31580/ijer.v3i2.1386
Margalina, V. M., Jiménez-Sánchez, Á. and Ehrlich, J. (2023). A Review of the Use of PLS-SEM in Neuromarketing Research. *Index.comunicación, 13*(2), 119-146. https://doi.org/10.33732/ixc/13/02Arevie
Margalina, V. M. and Cutipa-Limache, A. M. (2023). Similarities in factors affecting online shopping intention in Ecuador and Peru: a multigroup analysis. En L. Radomir, R. Ciornea, H. Wang, Y. Liu, C. M. Ringle, M. Sarstedt (eds.), *State of the Art in Partial Least Squares Structural Equation Modeling (PLS-SEM). Springer Proceedings in Business and Economics* (pp. 85-98). Springer, Cham. https://doi.org/10.1007/978-3-031-34589-0_10
Meneses, V. (2023, 1 de septiembre). *Surviving the 2023 economic slowdown in LATAM: a roadmap for the lifestyle and fashion logistic sector*. Americas Market Intelligence. https://bit.ly/425SLLC
Miglani-Neha, N. (2022). Consumer behaviour & online marketing strategies of fashion brands. *Mass Communicator: International Journal of Communication Studies, 16*(3), 38-40. http://dx.doi.org/10.5958/0973-967X.2022.00017.5
Mohseni, S., Jayashree, S., Rezaei, S., Kasim, A. and Okumus, F. (2018). Attracting tourists to travel companies'websites: the strcutural relantionship between website brand, personal value, shopping experience, perceived risks and purchase intention. *Current Issues in Tourism, 21*(6), 616-645. https://doi.org/10.1080/13683500.2016.1200539
Mousa, A. (2021). Intention to adopt E-Commerce: a comparative review across developed and developing economies. *The African Journal of Information Systems, 13*(1), 113-140. https://bit.ly/3HqLLiV
Nitzl, C., Roldán, J. L. and Cepeda, G. (2016). Mediation analysis in partial least squares path modelling. Helping researchers discuss more sophisticated models. *Industrial Management and Data Systems, 116*(9), 1849-1864. https://doi.org/10.1108/IMDS-07-2015-0302
Pena-Alcaraz, M. (2023, 7 de junio). *Melonn's Felipe Archila says the company hopes to win over online sellers and shoppers by improving transparency and reliability*. McKinsey & Company. https://bit.ly/491mN5y
Qalati, S. A., Galvan-Vela, E., Wenyuan, L., Dakhan, S. A., Hong Thuy, T. T. and Merani, S. H. (2021). Effects of perceived service quality, website

print ISSN: 1390-6291; electronic ISSN: 1390-8618

quality, and reputation on purchase intention: the mediating and moderating role of trust and perceived risk in online shopping. *Cogent Business Management, 8*(1), 1869363. https://doi.org/10.1080/23311975.2020.1869363

Ringle, C. M., Sarstedt, M., Sinkovics, N. and Sinkovics, R. R. (2023). A perspective on using partial least squares structural equation modelling in data articles. *Data in Brief, 48*(June), 109074. https://doi.org/10.1016/j.dib.2023.109074

Ringle, C. M., Wende, S. and Becker, J. M. (2022). *SmartPLS 4*. Boenningstedt: SmartPLS Gmbh, http://www.smartpls.com

Rosário, A. and Raimundo, R. (2021). Consumer marketing strategy and e-commerce in the last decade: a literature review. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(7), 3003-3024. https://www.doi.org/10.3390/jtaer16070164

Sanabria-Díaz, V. L., Torres-Ramírez, L. A. and López-Posada, L. M. (2016). Comercio electrónico y nivel de ventas en las MiPyMEs del sector comercio, industria y servicios de Ibagué. *Revista EAN*, (80), 132-154. https://bit.ly/3V3MO0r

Schlägel, C., y Sarstedt, M. (2016). Assessing the measurement invariance of the four-dimensional cultural intelligence scale across countries. A composite model approach. *European Management Journal, 34*, 633-649. https://doi.org/10.1016/j.emj.2016.06.002

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.H., Ting, H. and Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing, 53*(11), 2322-2347. https://doi.org/10.1108/EJM-02-2019-0189

Sevilla-Avilés, O. K. (2021). El impacto del comercio electrónico en el turismo de Latinoamérica. *CIID Journal, 2*(1), 77-96.https://bit.ly/3Oa4Uto

Singh, V., Chaudhuri, R. and Verna, S. (2019). Psychological antecedents of apparel-buying intention for young Indian online shoppers. Scale development and validation. *Journal of Modelling in Management, 14*(2), 286-311. https://doi.org/10.1108/JM2-05-2018-0059

Skypostal. (2019). *International E-Commerce Issues in Latin America. How to Tackle Them*. Skypostal. https://bit.ly/3T4Ljxy

Sohn, J. W., y Kim, J. K. (2020). Factors that influence purchase intention in social commerce. *Technology in Society*, *63*, 1-11. https://doi.org/10.1016/j.techsoc.2020.101365

Soler-Patiño, A. (2016). ¿Hacia dónde va el comercio electrónico en Colombia? *Ploutos, 4*(1), 17-24. https://bit.ly/3IpBa8B

Suominen, K. (2019). El comercio digital en América Latina ¿Qué desafíos enfrentan las empresas y cómo superarlos? *Comercio internacional*, (145), 1-49. https://bit.ly/48KiFXN

Taylor, J. W. (1974). The role of risk in consumer behavior. *Journal of Marketing, 38*(2), 54-60. https://doi.org/10.2307/1250198

Thomas, M. R., Kavya, V. and Monica, M. (2018). Online mechandising cues influencing the purchase intention of Generation Z Mediated by trust. *Indian Journal of Commerce and Management Studies, 9*(1), 13-23. https://bit.ly/48IFbAu

Venkatesh, V., Speier-Pero, C. and Schuetz, S. W. (2022). Why do people shop online? a comprehensive framework of consumers' online shopping intentions and behaviors. *Information Technology & People, 35*(5), 1590-1620. https://doi.org/10.1108/ITP-12-2020-0867

Yu, S., Hudders, L. and Cauberghe, V. (2018). Selling luxury products online: the effect of quality label on risk perception, purchase intention and attitude toward the brand. *Journal of Electronic Commerce Research, 19*(1), 16-35. https://bit.ly/4b6qCrK

Zhao, J-D., Huang, J-S. and Su, S. (2019). The effects of trust on consumer continuous purchase intentions in C2C social commerce: A trust transfer perspective. *Journal of Retailing and Consumer Perspectives, 50*, 42-49. https://doi.org/10.1016/j.jretconser.2019.04.014

Zhu, D. S., Lee, Z. C. and O'Neal, G. S. (2011). Mr. Risk! Please trust me: website acceptance of e-vendor website in Taiwan. *Journal of Internet Banking and Commerce, 16*(3), 1-23. https://bit.ly/48nBX4b

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.111-125
https://doi.org/10.17163/ret.n27.2024.08

Customer satisfaction in logistics: an analysis of chatbots in the leading companies of Colombia, Peru, and Ecuador

Satisfacción del cliente en la logística: un análisis de chatbots en las empresas líderes de Colombia, Perú y Ecuador

Pedro Ramos De Santis
Professor at Escuela Superior Politécnica del Litoral, Ecuador
pramos@espol.edu.ec
https://orcid.org/0000-0002-5968-481X

Received on: 03/11/23 **Revised on:** 04/12/23 **Approved** on: 19/02/24 **Published** on: 01/04/2024

Abstract: the article analyzes the potential effectiveness of chatbots on enhancing consumer service in the logistics industry, assessing the performance of ten prominent companies in Colombia, Peru, and Ecuador (CPE region). These companies, situated in the logistics services sector, play a crucial role in the supply chain, offering specialized services encompassing transportation, storage, and other areas within their economic activities. The study, involving 1250 individual B2C (business-to-consumer) users of chatbots, focused on analyzing the effectiveness of these tools and their impact on customer satisfaction. Through multiple regression analysis, key factors influencing customer satisfaction were identified, such as the ability to address issues, detailed knowledge of the company, autonomy in issue resolution, grammatical accuracy, and overall reputation. The results underscore the significant potential of chatbots to enhance customer service in logistics, emphasizing their effectiveness in issue resolution, familiarity with products and services, autonomy in issue resolution, grammatical correctness, and user recommendations. These findings are vital for the logistics sector, highlighting the transformative role of chatbots in elevating customer satisfaction and operational efficiency through technological integration.

Keywords: chatbot, effectiveness, logistics, multiple regression, service.

Resumen: este artículo analiza el impacto potencial de los chatbots en el mejoramiento del servicio al cliente en la industria logística, evaluando el rendimiento de diez destacadas empresas en Colombia, Perú y Ecuador (zona CPE). Estas empresas, insertas en el sector de servicios logísticos, desempeñan un papel crucial en la cadena de suministro, ofreciendo servicios especializados que abarcan transporte, almacenamiento y otras áreas dentro de su actividad económica. El estudio, que incluyó a 1250 usuarios individuales tipo B2C (empresa a consumidor) de chatbots, se enfocó en analizar la efectividad de estas herramientas y su repercusión en la conformidad del cliente. Mediante análisis de regresión múltiple, se identificaron elementos fundamentales que inciden en la satisfacción del cliente, como la capacidad de abordar problemas, el conocimiento detallado de la empresa, la autonomía en la resolución de problemas, la precisión gramatical y la reputación general. Los resultados destacan el potencial de los agentes virtuales para mejorar significativamente la atención al consumidor en la logística, señalando su eficacia en la resolución de problemas, familiaridad con productos y servicios, autonomía en la resolución de problemas, corrección gramatical y recomendaciones de usuarios. Estos hallazgos son cruciales para el sector logístico, subrayando el papel transformador de los chatbots en la elevación de la satisfacción del cliente y la eficiencia operativa mediante la integración tecnológica.

Palabras clave: chatbot, efectividad, logística, regresión múltiple, servicio.

Suggested citation: Ramos De Santis, P. (2024). Customer satisfaction in logistics: an analysis of chatbots in the leading companies of Colombia, Peru, and Ecuador. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 111-125. https://doi.org/10.17163/ret.n27.2024.08

Introduction

Using chatbots in customer service

Global logistics, driven by the rise of e-commerce, demands efficiency in customer service, leading companies to use technologies such as chatbots (Caldarini *et al*., 2022). These artificial intelligence (AI) programs simulate human conversations, providing continuous assistance without human intervention and improving customer satisfaction with information about orders, shipments and schedules (Nicolescu and Turodache, 2022).

The growing use of chatbots spans companies of different sizes and sectors, offering personalized interactions by simulating human conversations. Chatbot research has evolved since 2000 (Caldarini *et al*., 2022). In logistics, chatbots manage customer inquiries and complaints in a cost-effective way, providing ongoing attention, improving response times and handling repetitive tasks (Davenport *et al*., 2020).

Integrated into various channels, such as websites and social networks, chatbots adapt to the client's preferred method and understand natural language for more human responses (Illescas-Manzano *et al*., 2021; Ridha and Haura, 2022). The quality of their responses depends on carefully designed data and training algorithms, although in complex situations some clients prefer human interaction (Sarker, 2021; Trappey *et al*., 2021; Adamapolou and Moussiades, 2020; Xu *et al*., 2020).

The versatility of chatbots stands out by adapting to different industries and business scales, offering personalized support to democratize efficient customer service solutions (Perifanis and Kitsios, 2023). Companies under study, specializing in B2C services, distinguish by fast deliveries and tools for traceability, prioritizing customer service with fast responses, effective solutions and efficient transaction management. The study collected data from 1,250 B2C users to understand the correspondence between interaction with chatbots and the overall consumer compliance level.

Despite its growing popularity, understanding the impact of chatbots on customer satisfaction in logistics is essential. Its effective implementation improves the customer experience by providing fast and accurate responses.

Chatbots and Artificial Intelligence (AI)

Technology is advancing, and chatbots along with Artificial Intelligence (AI) are evolving, offering fascinating potential for human interaction with machines. These technologies influence daily life and the business environment. Chatbots, also called conversational agents, simulate human conversations through chat interfaces, providing automated responses limited to specific tasks using natural language interpretation algorithms (Adamapolou and Moussiades, 2020).

AI seeks to develop systems with human capabilities, such as learning and reasoning, and is used to make chatbots understand and respond to natural language more intelligently (Collins *et al*., 2021). It explores aspects such as auditory recognition, computer vision, and natural language processing.

The key difference is that chatbots are specific applications for interacting in a chat, while AI creates intelligent systems for various tasks. Chatbots, using AI techniques, have limited capacity to understand natural language and follow predefined patterns (Lin *et al*., 2023). Instead, AI, focusing on natural language processing (NLP), uses advanced algorithms to understand the meaning, intent, and context of human language, enabling more complex responses.

The integration of chatbots and AI systems promises more seamless and personalized interactions, as well as intelligent solutions across multiple industries. While chatbots improve customer service, AI expands possibilities in terms of automation and decision-making, significantly impacting how we interact with technology in the modern world.

In particular, the synergy between chatbots and AI systems not only improves natural language comprehension, but also allows these programs to evolve over time. AI's continuous lear-

print ISSN: 1390-6291; electronic ISSN: 1390-8618

ning capability ensures that chatbots are adapted to changing customer needs and be updated without constant intervention (Aldoseri *et al*., 2023).

Challenges and limitations of chatbots in customer service

Although virtual assistants offer numerous benefits to logistics companies, several challenges and limitations need to be considered, including technological limitations, customer preferences, and ethical concerns. Mageira *et al*. (2022) point out that chatbots face limitations in understanding and responding to natural language. Although they can recognize phrases and keywords, understanding the context can be challenging, causing customer misunderstandings and frustration, affecting company perception. According to Marjerison *et al*. (2022), another major challenge is the need for continuous maintenance and updates of chatbot programming. Adapting to changes in queries and customer preferences requires continuous investment of time and resources to maintain the effectiveness of the chatbot.

Customer preferences pose challenges, as some prefer the efficiency of chatbots, while others opt for human interaction, especially in sensitive situations (Hudiyono, 2022). Transparency is key to mitigating resistance, clearly indicating when they interact with a chatbot or human agent (Meyer *et al*., 2022).

Chatbots' limitations can affect their performance in logistics customer service, generating dissatisfaction and damaging the brand's reputation. Ethical concerns also arise, such as the need to program them to preserve client privacy and confidentiality (Khanum & Mustafa, 2022). In addition, the risk of chatbots perpetuating prejudice or discrimination should be considered, requiring careful design and monitoring to avoid problems (Brendel *et al*., 2022).

Adopting chatbots in customer service is not a universal solution (Caldarini *et al*., 2022; Zhang *et al*., 2021). They may not be suitable for all types of customer queries, and companies should evaluate the type of queries they receive to determine whether chatbots can effectively address them (Mohd *et al*., 2022). Complex inquiries or customer complaints may require human intervention to resolve satisfactorily.

While chatbots offer logistical benefits, such as improved service and reduced costs, they face challenges. Although efficient in common consultations, they can fail in emotional or specialized situations. Companies must identify areas of maximum value and ensure a smooth transition to human support when necessary (Kooli., 2023). Technological limitations, customer preferences, and ethical concerns are possible obstacles to adopting chatbots. Therefore, companies should carefully assess their suitability for their needs and ensure ethical and effective implementation.

Previous research has examined the effectiveness of chatbots in consumer care in various industries, including retail (Tran *et al*., 2021; Jiang *et al*., 2022; Tan and Liew 2022; Fan *et al*., 2023), healthcare (Abd-Alrazaq *et al*., 2020; Calvaresi *et al*., 2021, Rathnayaka *et al*., 2022; Puspitasari *et al*., 2022), tourism (Ivanov 2020; Zhang *et al*., 2022; Rafiq *et al*., 2022; Pereira *et al*., 2022) and finance (OECD, 2021; Nguyen *et al*., 2021; Lappeman *et al*., 2022; Ho and Chow, 2023; Sung *et al*., 2022). Chen and Florence (2021), measured the effectiveness of AI-enabled virtual assistants in consumer service using AnyLogic Simulation through scenario analysis, providing managerial implications for average system time, response rate, level of satisfaction, and cost savings. This helped companies understand the impact of adopting AI-enabled chatbots on customer service.

The logistics sector is highly competitive and, in this context, chatbots are gaining increasing acceptance and use in the industry, with many companies adopting them to improve their customer service offerings (Jenneboer *et al*., 2022). Although popular, the effectiveness of chatbots in this sector requires further study, evaluating their impact on satisfaction, response time and problem solving (Um *et al*., 2020). This study is relevant to ensure an efficient and reliable service in logistics, where customers demand accurate information about their orders to maintain loyalty. Although chatbots can be a solution, it is essential to evaluate their effectiveness in this context (Wetzel and Hofmann, 2020).

In short, the purpose of this research is to examine the effectiveness of chatbots in the logistics industry and their influence on customer satisfaction. This research is crucial to understanding how logistics companies can improve customer service and maintain a competitive advantage in the industry. In addition, it will provide valuable insights into the implementation of chatbots in logistics by identifying their strengths and limitations and assessing their impact on critical customer service metrics.

Materials and method

This research was carried out to assess the performance of chatbots in the customer service of logistics companies in the CPE region. Methodological aspects are detailed below, including the selection of participants, the research instrument and the collection of demographic data.

Participants and selection

The study involved 1,250 B2C clients from ten leading logistics companies specializing in services for end consumers operating in the CPE zone. The selection of these companies met specific criteria, such as the volume of operations, annual revenues, reputation and prestige in the sector, international presence, technological innovation, customer feedback and impact on the industry. These individuals were invited to participate through specific invitations sent by email to those customers who had used the chatbot services in the last six months. All participants expressed their willingness to be part of the study and provided informed consent before completing the survey.

Research instrument

The effectiveness of chatbots in the logistics industry was evaluated by a comprehensive survey instrument of 20 Likert-type items with responses ranging from 1 (expressing total disagreement) to 5 (indicating total agreement), coded Q_1 as Q_{20}, detailed in table 1, and designed to capture multiple dimensions of customer satisfaction. The survey, which used a 5-point Likert scale, focused on analyzing crucial aspects of chatbot performance. These aspects included ease of use, speed and quality of responses provided by chatbots, knowledge about products and services, problem-solving ability, language and grammar, and recommendation to other users. Each of these elements was carefully selected to obtain a comprehensive and accurate view of the customer experience in interaction with chatbots in the logistics industry.

Table 1
Set of Likert type variables

Code	Definition
Q_1	The chatbot was effective to meet my request
Q_2	It was easy to interact with the chatbot
Q_3	The chatbot provided me with timely answers
Q_4	The chatbot provided me with accurate answers
Q_5	The chatbot could solve my problem
Q_6	The chatbot exceeded my expectations
Q_7	The chatbot knew about the company's products/services
Q_8	The chatbot could understand my problem
Q_9	The chatbot saved me time compared to other support options
Q_{10}	The chatbot was reliable
Q_{11}	The chatbot was able to customize the interaction
Q_{12}	The chatbot could anticipate my needs
Q_{13}	The chatbot could empathize with my situation

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Code	Definition
Q_{14}	The chatbot could handle my problem without transferring me to a human agent
Q_{15}	The chatbot language was clear and easy to understand
Q_{16}	Chatbot responses were grammatically correct
Q_{17}	Chatbot tone was appropriate for interaction
Q_{18}	The chatbot responses were concise
Q_{19}	The chatbot was able to provide several options to solve my problem
Q_{20}	I would recommend other people to use the chatbot

This study used a 20-item Likert questionnaire, the result of a thorough consideration of the multiple dimensions that affect customer satisfaction with chatbots in logistics. Each item was selected for its relevance in measuring crucial aspects of the customer experience.

Ease of use, assessed by the accessibility and friendliness of the interface, seeks to address the user experience. The speed and quality of responses measure both the operational efficiency of the chatbot and the accuracy of its interactions. The assessment of product and service knowledge focuses on determining whether the chatbot has enough information to provide useful and accurate answers. Problem solving ability measures the effectiveness of the chatbot to address and solve problems autonomously. The evaluation of language and grammar focuses on the clarity and grammatical correctness of the answers, crucial aspects for the understanding and satisfaction of the user. Finally, the recommendation to other users provides a direct measure of customer satisfaction.

In addition, to enrich the analysis, relevant demographic information was collected from participants, including variables such as age, gender and educational level. This was done to identify possible patterns or variations in customer satisfaction related to these demographic characteristics.

This questionnaire was specifically designed to capture the complexities of interaction between users and chatbots in the logistics industry, carefully considering the elements that most impact consumer compliance. The formulation of the research hypothesis is based on the premise that the effectiveness of chatbots in this context is significantly influenced by key variables, such as the ability to solve problems, knowledge about products and services, autonomous problem management, grammatically correct responses and positive recommendations, all of them contributing directly to customer satisfaction.

Thus, considering all the information presented above, it is possible to propose the following research hypothesis:

The effectiveness of chatbots in the logistics sector is significantly influenced by key variables, such as the ability to solve problems, knowledge about products and services, autonomous problem management, grammatically correct responses and positive recommendations, directly impacting customer satisfaction.

Data analysis

The data collected was analyzed using the latest version of R Studio statistical software (2023.06.0+421) to explore the correlation between customer satisfaction and the use of chatbots. Descriptive statistics, such as mean scores, standard deviations, and frequencies, were used to provide an overview of the data distribution. In addition, bivariate correlations were carried out to examine the relationships between individual variables. A multiple regression analysis was performed to identify significant factors affecting customer satisfaction.

The structure of the model is the following:

$$y = \beta_0 + \sum_{i=1}^{19} \beta_i \, x_1 + \varepsilon$$

Where:

Y: dependent variable (the chatbot was effective to meet my requirement)

β_0: the intercept

$\beta_0 \ldots \beta_{19}$: regression coefficients for independent variables

$x_2 \ldots x_{20}$: independent variables

ε: error term or model residuals

In this process, the most statistically significant predictors were carefully selected, which structured the adjusted final model. All tests necessary to demonstrate the validity of the model were carried out, setting a significance level of 0.05 (p-value) for all statistical tests. This rigorous methodological approach allows for a deep understanding of the relationships between variables and provides reliable and robust results to support the conclusions of the study.

Results and discussion

Descriptive analysis of information

Regarding the *gender* variable, there is a slight predominance of the male gender with a presence of 50.8%, and 3.04% of respondents responded as "other". In relation to the *age* variable, the groups are relatively proportional, highlighting the group of 31 to 40 years (29.28%), being 51 to 60 years the least representative (22%). Regarding the variable *education*, the participation of people with university education predominates (46.16%), over those with master's level education (32.96%), with the group with secondary education being the least representative (20.88%).

The relationship between the age of the client and the use of chatbots can provide valuable information to adapt and improve the implementation of these technologies, ensuring their efficiency and satisfaction in a wide range of users. Generations vary in familiarity and comfort with technology. Researching how different age groups adopt and use chatbots can provide valuable insights into the overall acceptance of this technology in society.

In our case, the minimum age of the client is 21 years, the maximum 60 years and the average 40.15 years, and it turns out that, if we consider three age groups (390 clients from 21 to 33 years; 491 clients from 24 to 47 years and 369 clients from 48 to 60 years), it is revealed that the demographic most willing to use chatbots is the one between 24 and 47 years. Surprisingly, it was also detected that the older group has a percentage of use very similar to that of the younger ones, challenging in this case, the paradigm that older people reject the use of technological tools.

Table 2 presents the main statistical descriptors of the sociodemographic variables. The most significant variability corresponds to the age variable, with a lower dispersion in the *gender* variable. All the variables considered have a negative kurtosis coefficient, indicating distributions that are platycurtic, i.e., with little concentration of data around the mean. The distribution of the *age* variable data is slightly biased to the right, and the *gender* and *education* variables have small negative asymmetry coefficients, indicating a not very pronounced asymmetry to the left.

Table 2
Statistics on socio-demographic data

Variable	Average	Median	Standard deviation	Variance	Mode	Kurtosis	Asymmetry
Age	40.153	40.00	11,119	126,632	37.00	-1.054	0.067
Education	2.121	2.00	0.724	0.73	2.00	-1.081	-0.187
Gender	0.509	1.00	0.500	0.73	1.00	-1.999	-0.035

Regarding the correlations between sociodemographic variables, there is a moderate positive relationship between age and education. By contrast, the relationship between education and gender, as well as *age* and *gender* variables, is fragile and virtually null.

No respondents selected option 1 (strongly disagree) for any of the survey questions. The

print ISSN: 1390-6291; electronic ISSN: 1390-8618

variable in the question Q_9 obtained the highest percentage in option 4 (agree) with 66.0 %. The variables Q_{17} and Q_{18}, followed with 62.0 % and 56.0 %, respectively. The variable Q_6 recorded the highest percentage under option 2 (disagree) at 22 %. The variable Q_2 received the highest rate in option 5 (totally disagree) with 32 %, followed by the variable Q_{13} with 30.0 %.

Table 3 presents the main statistical descriptors of the survey data. The variable has the highest mean (4.08), while the variable has the lowest mean (3.22). The highest data variability corresponds to the question, and the lowest data dispersion is observed in the question. In addition, all the variables considered have a positive kurtosis coefficient, indicating leptocurtic distributions with a strong concentration of data around the mean. The variables associated with the questions Q_3, Q_4, Q_5, Q_6, Q_{12}, Q_{16}, and Q_{19} have a positive asymmetry coefficient; most observations are grouped to the left of the average value (values below the mean). In contrast, the other variables present a negative asymmetry coefficient, indicating that most observations are concentrated to the right of the average value (values above the mean).

Table 3
Statistics of Likert type variables

Code	Median	Variance	Mode	Kurtosis	Asymmetry
Q1	4.00	0.619	4.0	2,604	-0.071
Q2	4.00	0,973	4.0	2,398	-0.594
Q3	4.00	0,571	3.0	2,520	0.022
Q4	3.50	0.493	3.0	2,577	0.414
Q5	4.00	0,526	3.0	2,442	0.374
Q6	3.00	0,828	3.0	2,400	0.363
Q7	4.00	0.545	4.0	2,468	-0.048
Q8	4.00	0,547	4.0	2,601	-0.206
Q9	4.00	0.402	4.0	3,816	-0.413
Q10	4.00	0.547	4.0	2,601	-0.206
Q11	4.00	0.844	4.0	2,427	-0.422
Q12	4.00	0.555	3.0	2,335	0.325
Q13	4.00	0,606	4.0	2,331	-0.643
Q14	4.00	0.529	4.0	2,751	-0.254
Q15	4.00	0.890	4.0	2,120	-0.193
Q16	3.00	0.827	3.0	3,630	0.514
Q17	4.00	0.665	4.0	2,048	-0.324
Q18	4.00	0.751	4.0	3,057	-0.405
Q19	4.00	0.771	4.0	2,198	0.160
Q20	4.00	0.822	4.0	2,514	-0.197

Multiple linear regression analysis

The Cronbach coefficient, which evaluates the internal coherence of the elements of a scale, reveals the homogeneity of those elements, indicating that they all are oriented in the same direction (Taber, 2018). This coefficient, with a value of 0.92, is considered high, thus ensuring the reliability of the scale used (Doval *et al.*, 2023). In addition, the KMO (Kaiser-Meyer-Olkin coe-

fficient), with a result of 0.82, indicates that the sample size was suitable for analysis.

The analysis of the relationship between variables is crucial to develop a multiple regression model, revealing the intensity and orientation of the connections between independent and dependent variables. This process provides insights into the structure of data and the interconnection of variables, as well as it prevents problems such as multicollinearity, caused by high correlations between independent variables. Understanding these relationships guides decisions about which variables to include in the model, improving its accuracy and effectiveness. This informed approach facilitates the construction of regression models for predictions and support in decision making.

In our case, after applying Pearson's method to obtain the respective correlations, it is relevant to mention the following:

- All correlations obtained are positive.
- The highest correlation value (0.75) occurs between variables Q_1 and Q_{20}
- The lowest correlation value (0.04) occurs between variables Q_8 and $Q_{20.}$

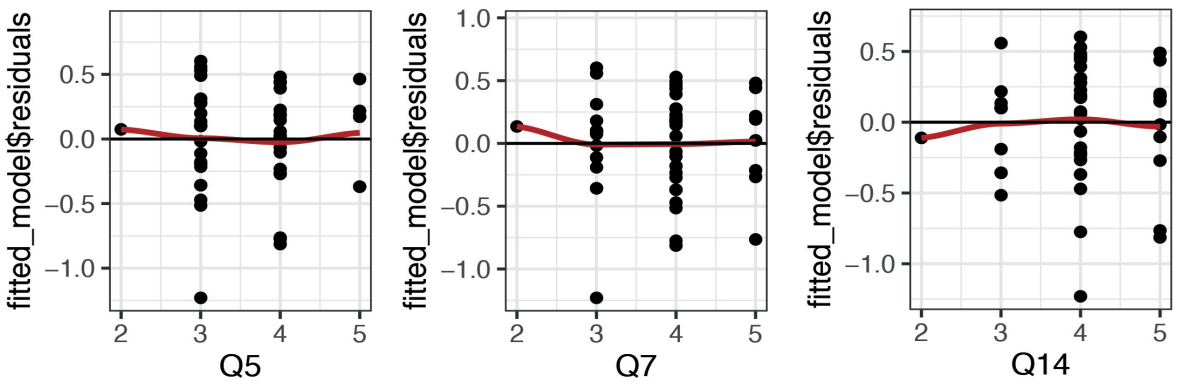
Using the general model, which contains all the variables as predictors, we obtain a determination coefficient R^2 value of 0.7877, which explains 78.77% of the variance, and a p-value of 9.9 x 10^{-6}. The choice of the most significant predictors was made by means of the Akaike measure (AIC), a process that after 13 steps confirmed that the variables Q_5, Q_7, Q_{14}, Q_{16} and Q_{20} are the best predictors, obtaining a value of 0.7512, which explains 75.12% of the variance and a p-value of 2.9 x 10^{-12} . Table 4 summarizes the information on the adjusted model coefficients.

Table 4
Adjusted model coefficients

Intercept	Q5	Q7	Q14	Q16	Q20
0.2747	-0.2381	4923	-0.2119	0.2908	0.5419

To validate the linear association between the predictors and the dependent variable, the scattering diagram between each predictor and the residuals of the fitted model was generated (see figure 1). In addition, Shapiro-Wilks normality test was performed, which yielded a W statistic of 0.94329 and a p-value of 0.01822.

Figure 1
Scatter Graph - Fitted Model



print ISSN: 1390-6291; electronic ISSN: 1390-8618

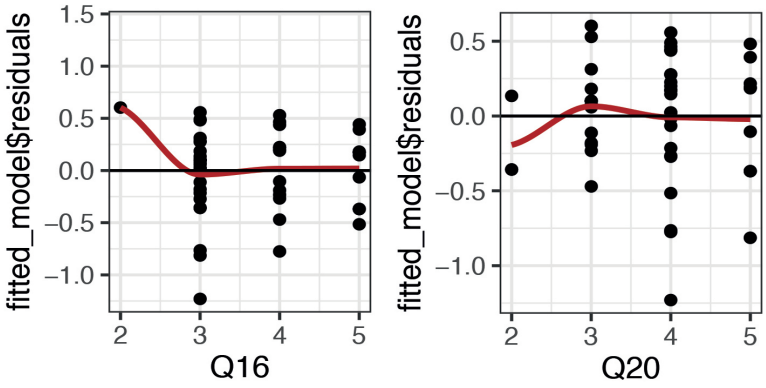
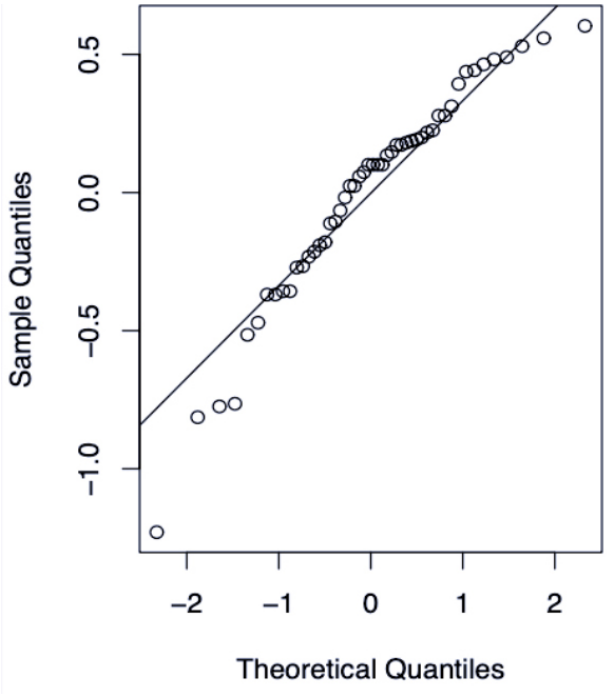


Figure 2 shows the Gaussian distribution of residues for the fitted model.

Figure 2
Normality in waste distribution – adjusted model

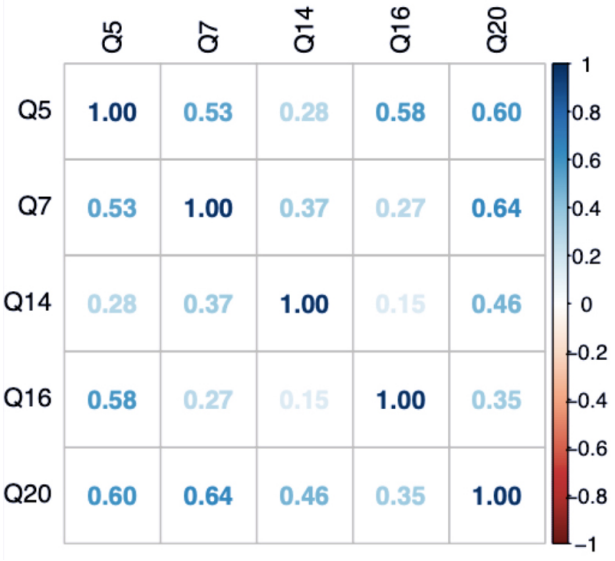


Subsequently, the standardized Breusch-Pagan test was applied, obtaining a BP statistic of 4.7853 with five degrees of freedom and a p-value of 0.4426.

After obtaining the correlation matrix between the predictors for the adjusted model (see Figure 3), it is essential to observe the following:

- All correlations obtained are positive.
- The highest correlation value (0.64) occurs between variables Q_7 and Q_{20}.
- The lowest correlation value (0.15) occurs between variables Q_{14} and Q_{16}.

Figure 3
Correlation matrix-adjusted model



Inflation analysis of variance (IVF), and Durbin-Watson autocorrelation tests were carried out to identify possible evidence of inflation or linear correlation between predictors (see tables 5 and 6).

Table 5
Inflation analysis of variance

Q_5	Q_7	Q_{14}	Q_{16}	Q_{20}
2.19167	1.83323	1.28585	1.52427	2.21194

Table 6
Durbin-Watson Test Results

Delay	Autocorrelation	DW Statistician	p-value	Q_{20}
1	0.09125	1.76743	0.41	2.21194

In conclusion, the adjusted multiple linear model has the following structure:

$$Q_1 = 0.2747 - (0.2381)Q_5 + (0.4923)Q_7 - (0.2119)Q_{14} + (0.2908)Q_{16} + (0.5419)Q_{20}$$

The general model, which included the 19 variables as predictors, has a high value of 0.7877; it can explain 78.77% of the observed variability in the effectiveness of chatbots. The p-value of this model is significant (9.9×10^{-6}), suggesting that the model is not random; at least one of the partial regression coefficients shows disparity with the value 0. These results indicate that the model as a whole has statistical relevance.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

The adjusted model, which included only the variables Q_5, Q_7, Q_{14}, Q_{16} and Q_{20}, has a R^2 greater value of 0.7229; it can explain 72.29% of the observed variability in the effectiveness of chatbots (only 6.58% less than the general model). The p-value of this model is significant (2.9×10^{-12}). From the logistic perspective, the adjusted model suggests that the five selected variables have a stronger relationship with the effectiveness of chatbots compared to the other variables. Hence, the results indicate that factors such as the ability to solve customers' problems, knowledge of products/services, problem management without transferring to a human agent, grammatically correct answers and general recommendations are especially relevant in the logistical context.

The Shapiro–Wilks normality test is used to evaluate whether a data sample likely comes from a normally distributed population (King & Eckersly, 2019). The test produces a statistic and a p-value; in our case, the SW statistic is 0.94329; this value varies between 0 and 1, being the values closest to 1 an indicator of a better adherence to normality. The p-value of the test is 0.018, suggesting that the data are not perfectly distributed in a normal way, since the p-value is less than 0.05. However, this does not necessarily mean that the data are highly non-normal, as the test statistic of 0.94329 indicates that the deviation from normal is relatively small. The interpretation of the results may also depend on the specific context and assumptions of the statistical analysis.

The Breusch–Pagan test looks for a correlation between residue variances and a specific set of predictor variables (Raza *et al*., 2023). The test compares the null hypothesis, which postulates that there is no such relationship, with the alternative hypothesis that predictor variables influence variances of residues parametrically. This test can be carried out by an auxiliary regression, in which explanatory variables suspected of causing heteroskedasticity are used to square the residues back to the proposed model (Klein *et al*., 2016). The test yielded a BP statistic of 4.7853 and a p-value of 0.4426, suggesting that residue variability remains constant, this being a desirable property for such a model. This means that the variability of residues is consistent across the range of values of the independent variables, and the model predictions are equally accurate regardless of the level of the predictor variables. Therefore, there is no evidence of lack of homoscedasticity.

Inflation analysis of variance (IVF) identifies and quantifies multicollinearity in a multiple regression model. Multicollinearity occurs when two or more predictor variables in a regression model are highly correlated, which can lead to problems with model interpretation and affect the accuracy of estimates of regression coefficients. A IVF value of 1 indicates no multicollinearity, while values greater than 1 indicate increasing levels of multicollinearity (Senaviratna and Cooray, 2019). Our analysis of the IVF reveals that there is no evidence of multicollinearity in the adjusted model, since all inflation variability indices are below the limit of 3, ensuring that the predictor variables do not present high correlations, thus preserving the stability and interpretability of the model.

The Durbin–Watson test indicates that no autocorrelation test is observed in the residues of the fitted model (DW statistic = 1.76743, p-value = 0.41). Autocorrelation occurs when residues of a regression model are correlated, which violates the assumption of independence from errors. Autocorrelation can lead to biased and inefficient estimates of coefficients and reduce the reliability of model predictions (Dubin, 1988).

In regression analysis, Cook's distance is used to detect observations that exert a significant influence that may disproportionately affect estimated regression coefficients. We found no observations with a Cook distance greater than 1. Therefore, no significant value affects the model estimates (Espinheira and Oliveira Silva, 2020).

The highly competitive logistics industry has seen in chatbots a solution to differentiate itself in customer satisfaction. These programs, based on natural language processing (NLP) and artificial intelligence (AI), improve the relationship with consumers and reduce the workload of the employee. This study has provided an in-depth and evidence-based insight into the relationship between the use of chatbots in the customer service of logistics companies in the CPE area and their effectiveness related to customer satisfaction. The

results obtained support the hypothesis raised in this research.

The results of the rigorous statistical analysis reinforce the notion that chatbots play a crucial role in improving customer service in the logistics sector. The significant and positive correlation between the use of chatbots and customer satisfaction highlights the ability of these systems to be a valuable tool in optimizing the customer experience. Key aspects, such as the effective solution of challenges, knowledge of inputs and services, responsiveness without human intervention, the use of precise grammar in responses and a strong reputation for customer satisfaction, were revealed as determining factors in the effectiveness of chatbots. By focusing on these factors, logistics companies can design more effective chatbots that more accurately meet their customers' demands and expectations.

The Cronbach and Kaiser-Meyer-Olkin indices highlight the internal consistency of the questionnaire scale and the robustness of the sample, supporting the robustness of the results achieved in the evaluation of the chatbots data.

The linear regression approach with multiple variables is effective, explaining the variability in chatbot effectiveness and showing linear relationships supported by scatter charts. This tool optimizes the strategic implementation of chatbots to improve customer service.

Although the observations did not perfectly fit a normal or Gaussian type distribution, the observed deviations are minor and do not significantly affect the interpretation of the results. The constant variability of the residuals suggests an appropriate fit of the model, but future research could explore the impact of sample dimension and distribution on model accuracy.

The multiple linear regression model suggests that the effectiveness of virtual assistants in customer support of logistics companies in the CPE zone is positively related to the chatbot's ability to solve customer problems, its knowledge about the company's products/services, its ability to handle problems without transferring them to a human agent, its grammatically correct responses, and its general recommendations to others. Interestingly, some of the variables that were not included in the adjusted model, such as Q_3 (timely responses) and Q_9 (time savings), had a lower impact on chatbot effectiveness. This suggests that customers can prioritize other aspects of chatbot performance over response time or time savings.

These findings are consistent with previous research on the influence of customer satisfaction with chatbots (Nicolescu and Turodache, 2022; Jenneboer *et al*., 2022, Um *et al*., 2020; Wetzel and Hofmann, 2020; Yun and Park, 2022; Haseeb *et al*., 2019; Tran *et al*., 2021; Tan and Liew, 2022, Fan *et al*., 2023) and suggest that customers can prioritize other aspects of chatbot performance over response time or time savings.

Conclusion

Although the findings of this research indicate that the implementation of chatbots in customer service can achieve a favorable impact on consumer satisfaction, it is important to recognize the limitations of this study such as geographical limitation and concentration in logistics companies. Future research could explore the loyalty and retention of customers, the quality of chatbot responses, the personalization of interactions, and the optimal balance between chatbot and human support. In addition, future studies could increase the size of the sample and the diversity of companies for a wider generalization of the results and additional aspects could be explored from the logistic perspective, such as the personalization of interactions and the optimal balance between chatbot and human support, for a more complete and generalizable understanding in the logistics field.

The implications of this study extend beyond the confirmation of the hypothesis, offering valuable perspectives for the practical application of chatbots in logistics customer service. Future research could explore additional aspects, the quality of chatbot responses in emotionally or highly specialized situations, and the optimal balance between chatbot and human support.

In conclusion, this study reinforces the idea that the use of chatbots in the customer service of logistics companies in the CPE area is positively related to customer satisfaction. It provides a solid framework for strategic decision making

print ISSN: 1390-6291; electronic ISSN: 1390-8618

in the implementation of chatbots, highlighting key areas that logistics companies can focus on to improve the effectiveness of their chatbots and ultimately the satisfaction of their customers.

Research support and financial support

Entity: Vice-Rector of Research and Development, Polytechnic School of the Littoral.

Country: Ecuador

City: Guayaquil

Project: Application of multivariate techniques to identify opportunities for improvement in operations and logistics management.

Project code: FCNM-12-2023

References

Abd-Alrazaq, A. A., Rababeh, A., Alajlani, M., Bewick, B. M. and House, M. (2020). Effectiveness and Safety of Using Chatbots to Improve Mental Health: Systematic Review and Meta-Analysis. *Journal of Medical Internet Research, 22(7).* https://doi.org/10.2196/16021

Adamapolou, E. and Moussiades, L. (2020). Chatbots: History, technology, and applications. *Machine Learning with Applications, 2(100006).* https://doi.org/101016/j.mlva.2020.100006

Aldoseri, A., Al-Khalifa, K. N. and Hamouda, A. N. (2023). Re-thinking data strategy and integration for Artificial Intelligence: concepts, opportunities, and challenges. *Applied Sciences, 13(12), 7082.* https://doi.org/10.3390/app131227082

Brendel, A. B., Mirbabaie, M., Lembcke, T. B. and Hofeditz, L. (2021). Ethical management of Artificial Intelligence. *Sustainability, 13(1974).* https://doi.org/10.3390/su13041974

Caldarini, G., Jaf, S. and McGarry, K. (2022). A literature survey of recent advances in chatbots. *Information, 13(41).* https://doi.org/10.3390/info13010041

Calvaresi, D., Calbimonte, J. P., Siboni, E., Eggenschwiler, S., Manzo, G., Hilfiker, R. and Schumacher, M. (2021). EREBOTS: privacy-compliant agent-based platform for multi- scenario personalized health-assistant chatbots. *Electronics, 10(666).* https://doi.org/10.3390/electronics10060666

Chen, J., Le T. and Florence, D. (2021). Usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing. *International Journal of Retailing and Distribution Management, 49(11), 1512-1531.* https://doi.org/10.1108/IJRDM-08-2020-0312

Collins, C., Dennehy, D., Conboy, K. and Mikalef, P. (2021). Artificial intelligence in information systems research: A systematic literature review and research agenda. *International Journal of Information Management, 60.* https://doi.org/10.1016/j.ijinfomgt.2021.102383

Davenport, T., Guja, A., Grewal, D. and Bressgott, T. (2020). How artificial intelligence will change the future or marketing. *Journal of the Academic Marketing Science, 48, 24-42.* https://doi.org/10.1007/s11747-019-00696-0

Doval E., Viladrich, C. and Angulo-Brunet, A. (2023). Coefficient Alpha: the resistance of a classic. *Psicothema, 35(1), 5-20.* https://doi.org/10.7334/psicothema2022.321

Meyer, Y., Weiger, W. and Hammerschmidt, M. (2022). Trust me, I'm a bot - Repercussions of chatbot disclosure in different service frontline settings. *Journal of Service Management, 33(2), 221-245.* https://doi.org/10.1108/JOSM-10-2020-0380

Espinheira, P.L. and de Oliveira Silva, A. (2020). Residual and influence analysis to a general class of simplex regression. *Test, 29, 523-552.* https://doi.org/10.1007/s11749-019-00665-3

Dubin, R. (1988). Estimation of regression coefficients in the presence of spatially autocorrelated error terms. *Review of Economic Statistics, 70(3), 466-474.* https://doi.org/10.2307/1926785

Fan, H., Gao, W. and Han, B. (2023). Are AI chatbots a cure-all? The relative effectiveness of chatbot ambidexterity in crafting hedonic and cognitive smart experiences. *Journal of Business Research, 156(113526).* https://doi.org/10.1016/j.jbusres.2022.113526

Haseeb, M., Hussain, H., Slusarczyk, B. and Jermsittiparset, K. (2019). Industry 4.0: A Solution towards technology challenges of sustainable business performance. *Social Sciences, 8(154).* https://doi.org/10.3390/socsci8050154

Ho, S. P. S. and Chow, M. Y. C. (2023). The role of artificial intelligence in consumers' brand preference for retail banks in Hong Kong. *Journal of Financial Services Marketing.* https://doi.org/10.1057/s41264-022-00207-3

Hudiyono, R. F. (2022). Exploring Indonesian companies' chatbots to gather customer experience. *Proceedings, 83*(1). https://doi.org/10.3390/proceedings2022083001

Illescas-Manzano, M., López, N., González, N. and Rodríguez, C. (2021). Implementation of chatbot in online commerce, and open innovation. *Journal of Open Innovation: Technology, Marketing and Complexity, 7(125).* https://doi.org/10.3390/joitmc7020125

Ivanov, S. (2020). The first chatbot of a tourism/hospitality journal: editor's impressions. *European Journal of Tourism Research, 24(2401).* https://doi.org/10.54055/ejtr.v24i.403

Jiang, K., Qin, M. and Li, S. (2022). Chatbots in retail: How do the affect the continued use and purchase intentions of Chinesse consumers? *Journal of Consumer Behavior, 21(4), 756-772.* https://doi.org/10.1002/cb.2034

Jenneboer, L., Herrando, C. and Constantinides, E. (2022). The impact of chatbots on customer loyalty: a systematic literature review. *Journal of Theoretical and Applied Electronic Commerce Research, 17, 212-229.*
https://doi.org/10.3390/jtaer17010011

Khanum, S. and Mustafa, K. (2022). A systematic literature review on sensitive data protection in blockchain applications. *Concurrency and Computation Practice and Experience, 35(1).* https://doi.org/10.1002/cpe.6426

King, A. and Eckersly, R. (2029). *Inferencial statistics IV: choosing a hypotesis test. Academic Press, 144-171.* https://doi.org/10.1016/B978-0-08-102939-8.00016-5

Klein, A., Gerhard, C., Büchner, R., Diestel, S. and Schermelleh-Engel, K. (2016). The detection of heteroscedasticity in regression models for psychological data. *Psycho Tests Assess Model, 58(4), 543-568.* https://bit.ly/49m5ooz

Kooli, C. (2023). Chatbots in education and research: a critical examination of ethical implications and solutions. Sustainability, 15(7), 5614. https://doi.org/10.3390/su15075614

Lappeman, J., Marlie, S., Johnson, T. and Poggenpoel S. (2022). Trust and digital privacy: willingness to disclose personal information to banking chatbot services. *Journal of Financial Services Marketing, 28, 337-357*
https://doi.org/10.1057/s41264-022-00154-z

Lin, C. C., Huang, A. and Yang, S. (2023). A review of AI-Driven conversational chatbots implementation methodologies and challenges (1999-2022). Sustainability, 15(5), 4012.
https://doi.org/10.3390/su15054012

Mageira, K., Pittou, D. Papasalouros, A, Kotis, K., Zangogianni, P. and Daradoumis, A. (2020). Educational AI chatbots for content and language integrated learning. *Applied Sciences, 12*(3239).
https://doi.org/10.3390/app12073239

Marjerison, R.K., Zhang, Y. and Zheng, H. (2022). AI in E-Commerce: application of the use and gratification model to the acceptance of chatbots. *Sustainability, 14(14270).*
https://doi.org/10.3390/su142114270

Mohd Rahim, N. I., Iahad, A., Yusof A. F. and Al-Sharafi, M. (2022). AI-Based chatbots adoption model for higher-education institutions: a hybrid PLS-SEM-Neural Network Modelling Approach. *Sustainability, 14*(12726).
https://doi.org/10.3390/su141912726

Nicolescu, L. and Turodache, M. (2022). Human-computer interaction in customer service: the experience with AI chatbots. A systematic literature review. *Electronics, 11, 1579.*
https://doi.org/10.3390/electronics11101579

OECD. (2021). Artificial Intelligence, machine learning, and big data in finance: opportunities, challenges, and implications for policy makers. The Organisation for Economic Co-operation and Development. https://bit.ly/3SKejZW

Nguyen, D. M., Chiu, Y. T. H. and Le, H. D. (2021). Determinants of continuance intention towards banks' chatbot services in Vietnam: A necessity for sustainable development. *Sustainability, 13(7625).*
https://doi.org/10.3390/su13147625

Pereira, T., Limberger, P. F., Minasi, S. M. and Buhalis, D. (2022). New insights into consumers' intention to continue using chatbots in the tourism context. *Journal of Quality Assurance Hospitality Tourism, 1-27.* https://doi.org/10.1080/1528008X.2022.2136817

Perifanis, N. A. and Kitsios, F. (2023). Investigating the influence of Artificial Intelligence on business value in the digital era of strategy: a literature review. *Information, 14(2), 85.*
https://doi.org/10.3390/info14020085

Puspitasari, I. W., Rinawan, F. R., Purnama, W. G., Susiarno, H. and Susanti A. (2022), A.I. development of a chatbot for pregnant women on a posyandu application in Indonesia: from qualitative approach to decision tree method. *Informatics, 9(88).* https://doi.org/informatics9040088

Rafiq, F., Dogra, N., Adil, M. and Wu, J.Z. (2022). Examining consumer's intention to adopt AI- chatbots in tourism using partial least squares structural equation modeling method. *Mathematics, 10(2190).*
https://doi.org/10.3390/math10132190

Rathnayaka, P., Mills, N., De Silva, D., Alahakoon, D. and Gray, R. (2022). A mental health chatbot with cognitive skills for personalised beha-

print ISSN: 1390-6291; electronic ISSN: 1390-8618

vioural activation and remote health monitoring. *Sensors, 22(3653).* https://doi.org/10.3390/s22103653

Raza, M., Ahmed, M., Razzaque, S. and Hina, H. (2023). Testing for heteroskedascity in the presence of outliers. *Journal of Education and Social Studies, 4(2), 313-329.* https://doi.org/10.52223/jess.2023.4209

Ridha, M. and Haura-Maharani, K. (2022). Implementation of Artificial Intelligence chatbot in optimizing customer service in financial technology company PT. FinAccel Finance Indonesia. *Proceedings, 83(210).* https://doi.org/10.3390/proceedings2022083021

Sarker, I. H. (2022), Machine learning: algorithms real world applications and research directions. *SN Computer Sciences, 2(160).* https://doi.org/10.1007/s42979-021-00592-x

Senaviratna, N. A. M. R. and Cooray, T. M. J. (2019). Diagnosing multicollinearity of logistic regression model. *Asian Journal of Probability and Statistics, 5(2), 1-9.* https://doi.org/10.9734/ajpas/2019/v5i230132

Sung, X., Yu, H. and Solvang, W.D. (octubre, 2022). Measuring the effectiveness of AI-enabled chatbots in customer service using anylogic simulation. *Proceedings of the International Workshop of Advanced Manufacturing and Automation, IWAMA. Xiamen, China.* https://doi.org/10.1007/978-981-19-9338-1_33

Taber, K. S. (2018). The use of Cronbach's Alpha when developing and reporting research instruments in Science Education. *Research Science Education, 48, 1273-1296.* https://doi.org/10.1007/s11165-016-9602-2

Tan, S. and Liew, T. (2022). Multi-chatbot or single-chatbot? The effects of M-Commerce chatbot interface on source credibility, social presence, trust, and purchase intention. *Human Behavior and Emergency Technologies.* https://doi.org/10.1155/2022/2501538

Tran, A., Pallant, J. y Johnson, L. (2021). Exploring the impact of chatbots on customer sentiment and expectations in retail. *Journal of Retailing and Customer Services, 63.* https://doi.org/10.1016/j.jretconser.2021.102718

Trappey, A. J. C., Trappey, C. V., Chao, M. H., Hong, N. J. and Wu, C. T. (2021). A VR-Enabled chatbot supporting design and manufacturing of large and complex power transformers. *Electronics, 11(87).* https://doi.org/10.3390/electronics11010087

Um, T., Kim, T. and Chung, N. (2020). How does an intelligent chatbot affect customers compared with self-service technology for sustainable services. *Sustainability, 12(5119).* https://doi.org/10.3390/su12125119

Wetzel, P. and Hofmann, E. (2020). Toward a multi-sided model of service quality for logistics service providers. *Administrative Sciences, 12(79).* https://doi.org/10.3390/admsci10040079

Xu, Y., Shieh, C., Van Esch, P. and Ling, I. (2020). AI customer service: task complexity, problem-solving ability, and usage intention. *Australasian Marketing Journal, 28(4), 189-199.* https://doi.10.3389/fpsyg.2022.922503

Yun, J. and Park, J. (2022). The effects of chatbot service recovery with emotion words on customer satisfaction, repurchase intention, and positive word-of-mouth. *Frontiers in Psychology, 13.* https://doi/org/10.3389/fpsyg.2022.922503

Zhang, B., Zhu, Y., Deng, J., Zhen, W., Liu, Y., Wang, C. and Zeng, R. (2022). I am here to assist your tourism: predicting continuance intention to use AI-based chatbots for tourism. Does gender really matter? *International Journal of Human-Computer Interaction, 1-17.* https://doi.org/10.1080/10447318.2022.2124345

Zhang J., Følstad, A. and Bjørkli C. (2021). Organizational factors affecting successful implementation of chatbots for customer service. *Journal of Internet Commerce, 22(1).* https://doi.org/10.1080/15332861.2021.1966723

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.127-142
https://doi.org/10.17163/ret.n27.2024.09

Validation of an assessment instrument for Latin American projects

Validación de un instrumento de evaluación de proyectos latinoamericanos

María Elizabeth Arteaga-García
Professor at Universidad Espíritu Santo, Ecuador
elizabeth.arteaga@uees.edu.ec
https://orcid.org/0000-0003-4786-0094

Cecilia Alexandra Portalanza-Chavarría
Professor at Universidad Espíritu Santo, Ecuador
aportalanza@uees.edu.ec
https://orcid.org/0000-0002-9782-5089

Received on: 22/08/23 **Revised on**: 01/10/23 **Approved** on: 22/02/24 **Published** on: 01/04/24

Abstract: this research aims to adapt and validate the Project Implementation Profile (PIP) instrument for evaluating projects carried out in Latin America. Four hundred twenty professionals participated as leaders or team members in projects completed in 2020-2021. As the instrument was developed in English, a translation and retranslation procedure was used, in which professional and academic experts in project management participated, along with certified translators, for its adaptation to the Spanish-speaking population in Latin America. For the exploratory factor analysis, the unweighted least squares extraction method was selected, obtaining four critical success factors: Communication with the client, monitoring and planning, senior management, and technical capabilities, with Cronbach Alpha coefficients between .876 and 933. Subsequently, confirmatory factor analysis was applied, demonstrating that the instrument has convergent and discriminant validity and, consequently, can be used in academia for future research on project management and professionally to evaluate the performance of Ecuadorian projects, considering the limitation that the percentage of participation of projects from other Latin American countries in the study sample was 22%.

Keywords: project management

Resumen: esta investigación tiene por objeto adaptar y validar el instrumento denominado Perfil de Implementación del Proyecto (PIP) para la evaluación de proyectos realizados en Latinoamérica. Participaron 420 profesionales involucrados, ya sea como líderes o miembros de equipos, en proyectos culminados en el periodo 2020-2021. Como el instrumento fue elaborado en inglés se utilizó un procedimiento de traducción y re-traducción, en el cual participaron expertos profesionales y académicos en gestión de proyectos junto con traductores certificados, para su adaptación a la población hispanoparlante en Latinoamérica. Para el análisis factorial exploratorio se seleccionó el método de extracción de mínimos cuadrados no ponderados, obteniéndose cuatro factores críticos de éxito: Comunicación con el cliente, seguimiento y planeación, alta gerencia, y capacidades técnicas, con coeficientes Cronbach Alpha comprendidos entre .876 y .933. Posteriormente se aplicó el análisis factorial confirmatorio, el cual demostró que el instrumento posee validez convergente y discriminante y, en consecuencia, puede ser utilizado en la academia para futuras investigaciones sobre la gestión de proyectos, y en lo profesional para evaluar el desempeño de proyectos ecuatorianos, contemplando la limitación de que el porcentaje de participación de proyectos de otros países de Latinoamérica en la muestra de estudio fue del 22 %.

Palabras clave: gestión de proyectos, desempeño, factores críticos de éxito, criterios de éxito, Latinoamérica

Suggested citation: Arteaga-García, M. E. and Portalanza-Chavarría, C. A. (2024). Validation of an assessment instrument for Latin American projects. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 127-142. https://doi.org/10.17163/ret.n27.2024.09

Introduction

Since the late 1960s, both academics and practitioners of project management have been interested in discovering what defines project failure or success (Avots, 1969), generating abundant literature on critical success factors (Aldrich, 1986; Ayat *et al*., 2021; Berssaneti and Carvalho, 2015; Correia and Martens, 2023; de Carvalho *et al*., 2015; Hughes *et al*., 2020; Ika, 2009; Ika and Pinto, 2023; Iriarte and Bayona, 2020; Khatatbeh, 2023; Lamprou and Vagiona, 2022; Leung *et al*., 2023; Pinto, 1990; Pinto and Covin, 1989; Pinto and Prescott, 1988, 1990; Pinto and Slevin, 1987; Sanchez *et al*., 2017; Sinesilassie *et al*., 2019; Slevin and Pinto, 1987; Williams, 2016; Yasin *et al*., 2009), and the project success criteria (Albert *et al*., 2017; Amies *et al*., 2023; Ika, 2009; Ika and Pinto, 2022; Jitpaiboon *et al*., 2019; Lamprou and Vagiona, 2022; Pinto and Prescott, 1990; Pinto and Slevin, 1988; Pollack *et al*., 2018; Shenhar and Holzmann, 2017; Thomas and Fernández, 2008; Varajão *et al*., 2022).

According to Müller and Turner (2010a, 2010b), critical success factors can be manipulated to increase the likelihood of project achievement, while the success criteria are the measurements under which project performance is evaluated. Slevin and Pinto (1986) interested in proposing a diagnostic tool for project managers, conceived a project implementation framework characterized by contemplating human and managerial aspects of successful project management, the Project Implementation Profile (PIP), based on ten critical success factors: Project Mission (M), Senior Management Support (AG), Project Schedule / Plan (PL), Customer Consultation (CC), Staff (PE), Technical Activities (TA), Customer Acceptance (CA), Follow-up and Feedback (SR), Communication (CO), and Problem Solving (RP). In its evaluation as a diagnostic instrument, it obtained high values of internal consistency of its factors, between .76 and .92. In addition, Pinto (1986) found that the ten factors contribute positively and significantly to the success of the projects.

Later, Pinto and Slevin (1988a, 1988b) incorporated into the PIP a construct to measure in parallel the success of the implementation of the project and its result (performance-D), from 12 items (success criteria) distributed in two categories: Project (the project meets the time and budget, and performs as expected) and client (the use of the project by the client, their satisfaction with the result, and the perceived impact of the project on organizational effectiveness).

Because of its versatility, PIP has been used to evaluate research and development projects (Pinto and Slevin, 1989), construction (Pinto and Mantel, 1990), technology and information (Chu and Banister, 1992; Mughal *et al*., 2019; Padilla *et al*., 2021; Rosacker and Olson, 2008), nongovernmental (Rusare and Jay, 2015), and health care (Nishimwe and McHunu, 2021). However, only two studies have presented reliability analysis of the instrument: Pinto and Prescott (1990) from the evaluation of 408 projects of North American companies, obtained Alpha Cronbach reliability indicators between .79 and .90 for critical success factors and .87 for the scale of success of the project; and the research of Padilla *et al.* (2021) that reported internal consistency indexes between .77 and .91 for the measurement of critical success factors of just over 200 projects carried out in Ecuador and Peru.

Research in Rwanda (Nishimwe and McHunu, 2021), Pakistan (Mughal *et al*., 2019), South Africa, Nigeria and Cameroon (Rusare and Jay, 2015), and Hong Kong (Chu and Banister, 1992) did not carry out a procedure for adapting and validating the PIP to the context, but the instrument, either in whole or in part, was used without modification, so the authors mention this fact as a limitation in their studies. On the contrary, Padilla *et al.* (2021) applied the PIP instrument, once they did the validation of content through a pilot test with directors of technology projects originating from Peru and Ecuador, modifying the wording of the questions to make them more understandable. A similar process was applied by Rosacker and Olson (2008) to validate the instrument in the context of a technology and information project of the US government sector.

The literature review shows that, with the exception of the study by Padilla *et al.* (2021), the PIP instrument, despite its proven versatility, has not been used to evaluate the critical success factors in project management or the criteria of success of the

print ISSN: 1390-6291; electronic ISSN: 1390-8618

project in Latin American countries. Consequently, it is relevant to have an instrument adapted to the Latin American context and a complete validation process to facilitate the collection of information from those involved in the management of projects and their projects, and thus evaluate their critical factors of success and performance to identify strengths and opportunities for improvement, in order to contribute positively with the maturity of organizations in project management. Consequently, this research aims to adapt and validate the instrument called Project Implementation Profile (PIP) for projects carried out in Spanish-speaking countries in Latin America.

Materials and method

Participants

In this study, 420 professionals involved in project management participated voluntarily, either in the role of leader or team member, who were contacted between mid-July 2022 and the end of January 2023, through the membership department of the PMI Latin America chapters, the Latin American groups of topics associated with Project Management on LinkedIn, and academic directorates of postgraduate degrees in Project Management of the region, with the aim of obtaining a representative sample of the context of interest of this study. While most are Ecuadorians, 22% originate from other Latin American countries: Argentina (9%), Peru (10.2%), Colombia (0.2%), Chile (0.2%), Mexico (2%), Paraguay (0.2%), and Uruguay (0.2%). 35% are female, 67% are between 30 and 50 years old, 95% register university studies; and of these, 45% have a master's degree; 24% have an international certification in project management.

Out of the projects assessed, 59% were carried out for large companies, generating a variety of products and services: technology (24%), construction (21%), industrial (13%), commercial (10%), public services (8%), consulting (6%), education (6%), health (4%), and research and development (4%). Table 1 presents the typification of the projects analyzed, according to their duration and budget, considering the Burgan and Burgan criteria (2014), used in other research (Ishfaq *et al.*, 2022; Ng *et al.*, 2022; Wangsa *et al.*, 2022).

Table 1
Size of projects

Size	Duration	%	Budget	%	Team Members	%
Small	Less than 6 months	22.1	Less than US$ 100 000	43.1	Less than 5	11.9
Medium	Less than 1 year	26.4	Less than US$ 500 000	20.7	Less than 20	61.9
Large	1 year or more	51.4	$500,000 or more	36.2	20 or more	26.2

Instrument and procedure

For this study, the instrument called Project Implementation Profile (*PIP*) was used, which is made up of 62 items, 50 measure the critical success factors (five for each of the ten factors described in table 2) and 12 the criteria of success of the project. All items are evaluated on a seven-point Likert scale (strongly disagree (1) to strongly agree (7)). The instrument was requested from one of its authors, Jeffrey Pinto, who submitted the full version in its original language, English. Therefore, the translation and re-translation procedure was applied to adapt it to the Spanish-speaking population of Latin America (Tilburg and Hambleton, 1996). A certified translator in Spanish and English performed the Spanish translation of the original PIP.

Table 2
Project Implementation Profile (PIP)

Critical success factors
Project mission (M): initial clarity for the project team of the project objectives, alignment of the project objectives with the strategic objectives and overall management.
Top management support (AG): readiness of top management to grant resources and authority necessary for the success of the project.
Project schedule/plan (PL): details of the individual actions required for project management and management of resources, times, budget and risks.
Client Consultation (CC): communication, consultation and active listening of all parties involved about the progress, value, limitations and adjustments to the project.
Personnel (PE): search, evaluation, selection, and training of the personnel that make up the project team.
Technical tasks (TA): availability of technology and expertise required to carry out specific technical activities.
Client Acceptance (CA): sell the project to the intended end users and validate its usefulness to customers.
Monitoring and feedback (SR): timely delivery of comprehensive control information (budget compliance, schedule, staff and equipment usage, etc.) at every stage of the implementation process.
Communication (CO): all key actors are provided with a suitable network of contacts and the necessary data for the implementation of the project.
Trouble shooting (PR): sudden crisis management skills and plan updates.

Note. Slevin and Pinto (1986).

Subsequently, two focus groups were organized: one with seven professional and academic experts in project management (expert judges); and, the second with four project managers and postgraduates in project management (target audience), who were asked to read the translated instrument's items and indicate whether its wording was clear and logical. As a result of this content validation stage, two items were removed (one from the *mission* factor and one from the *performance* construct) and an item was added to the *follow-up and feedback* factor, leaving a total of 61 items. The revised PIP instrument was translated into English by another certified translator in Spanish and English. An expert in both languages and in the subject of project management compared both versions to ensure the semantic equivalence, before sending the revised instrument in English to the author, who confirmed that it could be used in this research.

Between July 2022 and January 2023, the tool was distributed through the *Question Pro* tool to the members of the chapters of the *Project Management Institute-PMI* Latin America, professionals registered on *LinkedIn*, and postgraduates in project management. A total of 420 people completed the questionnaire, with a response rate of 65%. The average completion time of the instrument was 13 minutes. SPSS 29.0 was used for data coding and exploratory factor analysis, and Smart PLS 4 for confirmatory analysis (Ringle *et al.*, 2022).

Results and discussion

Exploratory Factor Analysis

Descriptive statisticians and the Kolmogorov–Smirnov test determined that all PIP items did not have a normal distribution. Consequently, to examine the validity of constructs (Thompson, 2004), the unweighted least squares method was used for exploratory factor analysis (Watkins, 2021).

Out of the 50 items, seven (two from the Mission factor, two from the Personnel factor, and three from the Schedule/Plan factor) were eliminated for having figures below .5 (Hair *et al.*, 2018). While 19 items (one of the Mission factor, one of the Schedule/Plan factor, two of the Personnel factor, two of the Technical task factor, two of the Client Acceptance factor, one of the Follow-up

print ISSN: 1390-6291; electronic ISSN: 1390-8618

and Feedback factor, all of the Communication and Trouble shooting factors) were eliminated by presenting loads higher than .4 in two or more factors at the same time (Hair *et al.*, 2018).

The matrix of factors with Varimax rotation of the critical success factors resulted in the extraction of four factors that explain 66.98% of the total variance. Factor scale reliability was measured through Cronbach's Alpha (Cronbach, 1951): Client communication (a = .931), monitoring and feedback (a = .933), top management (a = .914), and technical task (a = .876), and for global scale (a = .962), showing excellent results. The communalities fluctuated between .521 and .900, complying with the recommendation that they be higher than .5, meaning that the common variance is the one with the highest representativeness in the total variance. All items had factor loads greater than .4, confirming the relevance of the item to the factor (Hair *et al.*, 2018). The Kaiser-Meyer-Olkin index (KMO) was .962 and the Bartlett test result was statistically significant, showing that the sample adequacy for this analysis is met (see table 3).

Table 3

Exploratory factor analysis of PIP (critical success factors). Rotated factor matrix

Item	Factor			
	Client Communication	Monitoring and feedback	Top Management	Technical task
BQ2	0.658			
BC3	0.701			
CA4	0.672			
CC1	0.762			
CC2	0.692			
CC3	0.641			
QC4	0.707			
CC5	0.738			
M2		0.567		
PE3		0.471		
PL2		0.639		
SR1		0.706		
SR2		0.647		
SR3		0.683		
SR4		0.771		
SR5		0.766		
AG1			0.727	
AG2			0.707	
AG3			0.713	
AG4			0.742	
AG5			0.624	0.522
AT2				0.828
AT3				0.698
AT4				0.876
Cronbach's alpha	0.931	0.933	0.914	0.876

Note. Extraction method: Unweighted least squares. Rotation method: Varimax with Kaiser normalization. The rotation has converged in three iterations. Kaiser Meyer Olkin (KMO) = .962; Bartlett sphericity test (8107.55, p < .0001).

The matrix of factors with Varimax rotation resulted in the extraction of two factors that explain 71.87% of the total variance. High reliability rates were obtained for both the global scale and the Client and Project factors, which is positive for the study: a = .871, a = .915, and a = .802, respectively. The communalities fluctuated between .585 and .805 complying with the recommendation that they be higher than .5, which means that the common variance is the one with the greatest representativeness in the total variance. All items had factor loads greater than .4, confirming the relevance of the item to the factor. Out of the 11 items, five items (one from the Project factor and four from the Client factor) were eliminated because they had loads above .4 in two or more factors at the same time (Hair *et al.*, 2018). The Kaiser-Meyer-Olkin index (KMO) was .852 and the Bartlett test result was statistically significant, showing that the sample adequacy for this analysis is met (see table 4).

Table 4

Exploratory factor analysis of PIP (performance). Rotated factor matrix

Ítem	Factor	
	Customer	Project
D3	0.812	
D4	0.858	
D10	0.848	
D11	0.720	
D1		0.716
D2		0.848
Cronbach's alpha	0.915	0.802

Note. Extraction method: Unweighted least squares. Rotation method: Varimax with Kaiser normalization. The rotation has converged in three iterations. Kaiser Meyer Olkin (KMO) = .852; Bartlett sphericity test (1583.12, p < .0001).

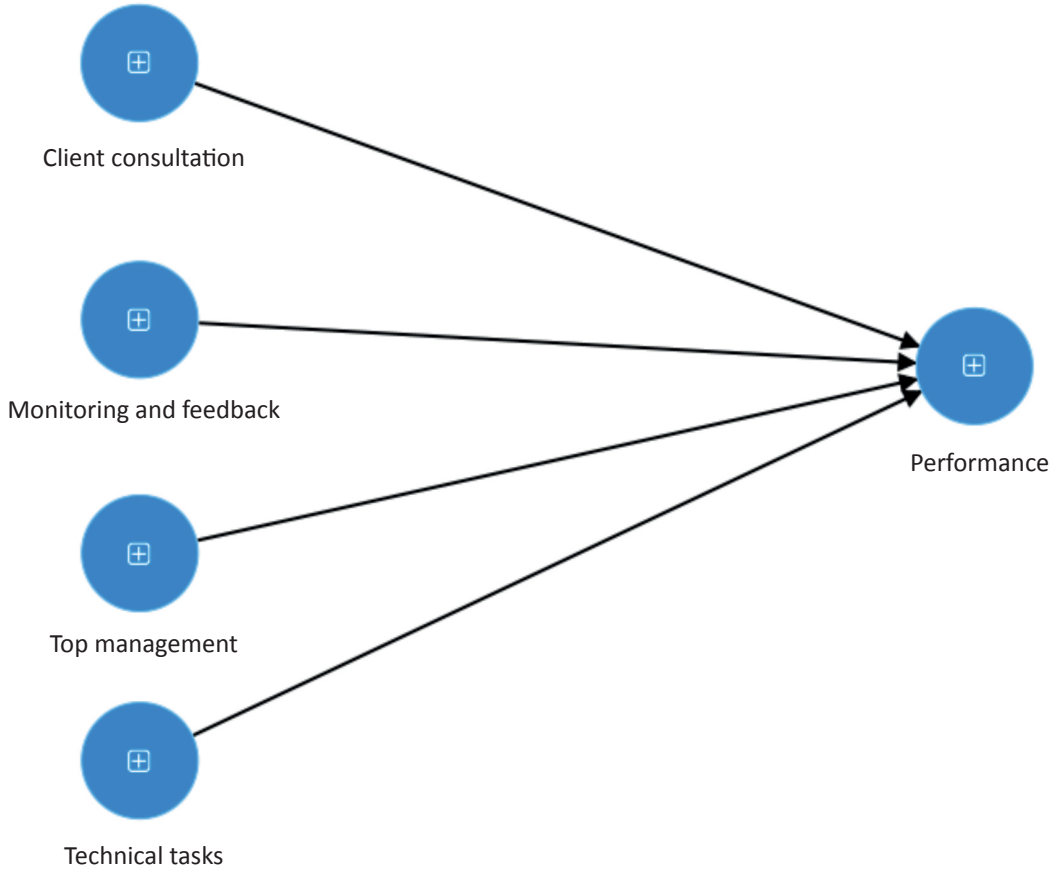
At the end of this stage, an adapted PIP consisting of 30 items has been obtained: 24 measure the critical success factors, and six measure the performance of the project. Compared to the original PIP, a reduction of 32 items was evidenced, and the adjustment of ten to four critical success factors. Factor and performance scales account for 67% and 72% of the total variance, and register an a of .962 and .871, respectively. The internal consistency of the adapted scales show better results than those published by Pinto and Prescott (1990) and Padilla *et al.* (2021).

Confirmatory Factor Analysis

Pinto (1986) found that the ten critical success factors contributed positively and significantly to project performance (success). Since the exploratory factor analysis was completed, the ten factors became four: client consultation, monitoring and feedback, top management and technical tasks; it is proposed to perform the analysis of reliability, convergent and discriminant validity of the model presented in Figure 1.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Figure 1
Proposed model



Proposed model: Convergent and discriminant validity

While Table 5 shows that all latent constructs exhibit Cronbach's Alpha and a composite reliability higher than .7 (Bagozzi *et al.*, 1998; Hair Jr. *et al.*, 2021), two items (CC5 and D1) do not register factor loads equal to or greater than .7 (Hair Jr. *et al.*, 2021; Hulland, 1999), therefore these items should be removed as they do not contribute to internal consistency. Regarding convergent validity, this exists when each group of items converges to measure the same construct (Anderson and Gerbing, 1988), this is confirmed for all subscales since they have an extracted mean variance (AVE) greater than .5. The existence of discriminant validity is established (see table 6), since the AVE of each construct is superior to its correlations with other latent variables, i.e., each measurement scale represents a dimension separately, and no item contributes at the same time to more than one dimension (Fornell & Larcker, 1981).

Table 5

Proposed model: factor loads, reliability and extracted mean variance

Subscales	Items	Factor loads	Cronbach's alpha (a)	Reliability (FC)	Mean Extracted Variance (AVE)
Client consultation	BQ2	0.85	0.932	0.935	0.629
	BC3	0.811			
	CA4	0.868			
	CC1	0.742			
	CC2	0.828			
	CC3	0.847			
	CC4	0.729			
	CC5	0.638			
Top management	AG1	0.842	0.915	0.916	0.682
	AG2	0.783			
	AG3	0.849			
	AG4	0.782			
	AG5	0.869			
Technical task	AT2	0.801	0.875	0.878	0.703
	AT3	0.865			
	AT4	0.848			
Monitoring and feedback	M2	0.745	0.933	0.936	0.637
	PE3	0.802			
	PL2	0.726			
	SR1	0.9			
	SR2	0.83			
	SR3	0.836			
	SR4	0.759			
	SR5	0.773			
Performance	D1	0.676	0.886	0.891	0.571
	D2	0.711			
	D3	0.738			
	D4	0.764			
	D10	0.82			
		0.814			

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Table 6
Proposed model: discriminatory validity

	Technical activities	Senior management	Communication with the customer	Monitoring and planning	Performance
Technical task	**0.839**				
Top management	0.752	**0.826**			
Client consultation	0.652	0.666	**0.793**		
Monitoring and feedback	0.712	0.748	0.774	**0.798**	
Performance	0.757	0.726	0.663	0.705	**0.756**

Corrected model: convergent and discriminant validity

In Table 7, once items CC5 and D1 have been removed, it is observed that the final subscales successfully comply with the internal consistency reliability tests, since they have a Cronbach's Alpha and a composite reliability higher than .7 (Bagozzi *et al*., 1998; Hair Jr. *et al*., 2021), and factor loads equal to or greater than .7 (Hair Jr. *et al*., 2021; Hulland, 1999). Regarding convergent validity, this is confirmed for all subscales with an AVE higher than .5 (Bagozzi *et al*., 1998; Hair Jr. *et al*., 2021). The corrected model meets the discriminant validity under Fornell and Larcker criteria (1981) (see table 8). Table 9 presents the contrast of the models, showing the improvement of absolute and incremental goodness-of-fit indices (SRMR. < .05; NFI closer to 1) and the predictive power of the respecified model by decreasing the BIC index that is much more rigorous than the Akaike criterion (Bentler and Bonett, 1980; Hair Jr. *et al*., 2021; Hu and Bentler, 1999).

Table 7
Corrected model: factor loads, reliability and extracted mean variance

Subscales	Items	Factor loads	Cronbach's alpha (a)	Composite Reliability (FC)	Mean Extracted Variance (AVE)
Client consultation	BQ2	0.855	0.924	0.926	0.633
	BC3	0.794			
	CA4	0.858			
	CC1	0.708			
	CC2	0.815			
	CC3	0.826			
	CC4	0.698			
Top management	AG1	0.827	0.915	0.916	0.682
	AG2	0.766			
	AG3	0.852			
	AG4	0.798			
	AG5	0.880			
Technical task	AT2	0.804	0.875	0.878	0.703
	AT3	0.866			
	AT4	0.844			

Subescalas	Items	Factor loads	Cronbach's alpha (a)	Composite Reliability (FC)	Mean Extracted Variance (AVE)
Monitoring and feedback	M2	0.741	0.933	0.936	0.637
	PE3	0.779			
	PL2	0.734			
	SR1	0.903			
	SR2	0.847			
	SR3	0.839			
	SR4	0.762			
	SR5	0.766			
Performance	D2	0.721	0.888	0.893	0.619
	D3	0.755			
	D4	0.786			
	D10	0.839			
	D11	0.828			

Table 8

Corrected model: discriminating validity

	Technical task	Top management	Client consultation	Monitoring and feedback	Performance
Technical task	**0.839**				
Top management	0.752	**0.826**			
Client consultation	0.663	0.671	**0.796**		
Monitoring and feedback	0.712	0.747	0.777	**0.798**	
Performance	0.752	0.704	0.663	0.683	**0.787**

Table 9

Adjustment rates of the tested models

Model	Original	Corrected
SRMR.	0.053	0.048
Chi-square	1552.884	1168.08
NFI	0.852	0.879
BIC Performance	-421.797	-396.846

Note. SRMR.=Standardized Root Mean Square Residual; NFI= Normed Fit Index; BIC= Bayesian Information Criterion.

At the end of this stage, a final adapted PIP consisting of 28 items is achieved: 23 measure the critical success factors, and five measure the project performance (see table 10). Compared to the original PIP, a reduction of 34 items was evidenced and the adjustment of ten to four critical success factors is maintained: client consultation, monitoring and feedback, top management, and technical task. Factor and performance scales register an AVE above .61, the composite reliability of factors is between .878 and .936, and the performance is .893. The internal consistency of

print ISSN: 1390-6291; electronic ISSN: 1390-8618

the final adapted scales show better results than those published by Pinto and Prescott (1990) and Padilla *et al.* (2021). In addition to the fact that the adapted instrument has adequate consistency and validity indexes, it is highlighted that it is shorter, which gives rise to some advantages for the investigations in which it is used, such as: increase the response rate, improvement of the quality of the responses considering that it takes less time to complete it, ease of design of the instrument and data collection through online platforms or mobile applications; from the point of view of the researcher, data analysis is accelerated and less human and financial resources are required.

Table 10

Validated instrument adapted to the Latin American context

	Strongly disagree			Neutral			I agree
Top management	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Top management responded to requests for additional resources when needed.							
Top management shared the responsibility with the project team to ensure the success of the project.							
I agreed with top management regarding the degree of authority and responsibility they had in the project.							
Top management supported me during the project crises.							
The top management gave us the necessary authority to the project team and supported our decisions related to the project.							
Client consultation	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The usefulness of the project was validated with potential clients.							
An appropriate presentation of the project was made to the clients.							
Clients knew who to contact when there were problems or questions.							
Clients had the opportunity to collaborate with the team from the initial stage of project development.							
Clients were informed about the progress of the project.							
The value of the project was discussed with potential clients.							
The limitations of the project (why the project was not designed) were discussed with the clients.							
Technical tasks	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The engineers and other technical staff of the project were competent.							
The technology used to develop the project worked correctly.							
Suitable technology was selected for the project to be successful, including: equipment, training programs, etc.							
Monitoring and feedback	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The scope and essential objectives of the project were explained to the project team.							

	Strongly disagree			Neutral			I agree
Top management	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The project team staff understood how their performance was assessed.							
There was a detailed plan, including timelines, milestones, resource requirements, etc., for project fulfillment.							
All the important aspects of the project were monitored, including the measurements that allowed to visualize the progress of the project in a complete way (compliance with the budget and the schedule, use of personnel and equipment, team morale, etc.).							
Regular meetings were held to monitor the progress of the project and to improve team feedback.							
Real progress against the approved project schedule was regularly compared.							
Actual performance against the approved project budget was regularly compared.							
The outcome of the project reviews was regularly shared with all the staff who influenced the budget and schedule.							
Project performance	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The project was on budget.							
The project worked.							
The project is used by the intended customers.							
This project directly benefited the intended users.							
The results of this project represented a significant improvement in performance in relation to the way customers used to carry out their activities.							

Khan *et al.* (2013) point out that there is no universal model of success factors that can be used in all projects, leading to various proposals of factors in response to contextual and/or typifying variables. Notely, the critical success factors of the respecified instrument are among the most cited in the literature (Khan *et al.*, 2013; Pereira *et al.*, 2022). A similar situation arises with the criteria of success of the project, since there is no consensus on how to measure whether a project is successful, causing the existence of many criteria (Albert *et al.*, 2017), whose variation responds, also with the factors, to contextual and/or typing variables (Khan *et al.*, 2013; Müller and Jugdev, 2012; Müller and Turner, 2007). The criteria considered in the Performance of the respecified instrument construct are present in the analysis of contemporary literature by *Castro et al.* (2019).

Therefore, based on the instrument designed by Pinto, Slevin and Prescott, this study contributes with an adapted instrument with complete validation, mainly for the Ecuadorian context, because the participation of professionals from other countries in the region does not exceed 25% of the sample. This will make it easier for managers and others involved to assess critical success factors and success criteria, since both are necessary to achieve the objectives of their projects (Castro *et al.*, 2019).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Conclusions

This research has resulted in a shorter adapted PIP than the original instrument. This respecified instrument enables its use in Spanish and has very good consistency, validity, and goodness of fit rates, which contributes to the academic field by facilitating the collection of data on the critical factors and criteria of success of the projects, particularly in the Ecuadorian context, considering that in the study sample this country represented approximately 80%. For future research, it is suggested to evaluate the structural model to confirm whether the four critical success factors results positively and significantly impact the performance of projects; use multigroup analysis techniques to make comparative studies by categorical variables such as role in the project, size of the beneficiary organization of the project, size of the project, development approach, among others, which will increase the presence of high-impact Ecuadorian publications in the area of Project Management. In addition, this research can be replicated in other countries of the region to have representative samples that allow obtaining a generalizable instrument to the Latin American context.

In terms of practical implications, project management professionals can use this tool to assess the critical factors and success criteria of their projects in less time and with fewer resources to identify in which aspects they are doing well, and in which they must take corrective actions and record lessons learned, so that projects are successful. Projects are those that make it easier for organizations to create or adapt to changes in the environment, and this leads to project management becoming a relevant factor in achieving organizational objectives (Sepúlveda-Rivillas *et al.*, 2022) and a source of sustainable competitive advantage (Mathur *et al.*, 2014).

Among the limitations of the study are the fact that approximately 80% of the sample comes from Ecuador, and that there was no representativeness of projects with an agile development approach, therefore, the instrument obtained can be applied to preferably evaluate Ecuadorian projects with a predictive or hybrid development approach.

Another limitation to consider is the variance bias of the common method, since the data of all the analyzed variables were collected from the same source, so the procedural remediations of Podsakoff *et al.* (2003) were followed as the careful construction of the items, and the request for reading and subsequent acceptance of informed consent to the participant prior to filling in the questionnaire, where anonymity is guaranteed and encouraged to respond objectively and honestly to minimize socially desirable responses.

Research support and financial support

Entity: Research Center (CIN)-UEES

Country: Ecuador

City: Samborondón

Subsidized Project: Study of the Talent Triangle of Project Managers in Latin America

References

Albert, M., Balve, P. y Spang, K. (2017). Evaluation of project success: a structured literature review. *International Journal of Managing Projects in Business*, *10*(4), 796-821. https://doi.org/10.1108/IJMPB-01-2017-0004

Aldrich, D. S. (1986). A sequential procedure for implementing a computer-based information system. *Journal of the American Dietetic Association*, *86*(9), 1228-1231. https://bit.ly/4bV4H7B

Amies, P., Jin, X. and Senaratne, S. (2023). Systematic literature review on success criteria for dam engineering projects. *Journal of Construction Engineering and Management*, *149*(1). https://doi.org/10.1061/(ASCE)CO.1943-7862.0002421

Anderson, J. C. and Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411. https://doi.org/10.1037/0033-2909.103.3.411

Avots, I. (1969). Why does project management fail? *California Management Review*, *12*(1), 77-82. https://doi.org/10.2307/41164208

Ayat, M., Imran, M., Ullah, A. and Kang, C. W. (2021). Current trends analysis and prioritization of success factors: a systematic literature review of ict projects. *International Journal of Managing Projects in Business*, *14*(3), 652-679. https://doi.org/10.1108/ijmpb-02-2020-0075

Bagozzi, R. P., Yi, Y. and Nassen, K. D. (1998). Representation of measurement error in marketing variables: review of approaches and extension to three-facet designs. *Journal of Econometrics*, *89*(1-2), 393-421. https://doi.org/10.1016/S0304-4076(98)00068-2

Bentler, P. M. and Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588. https://doi.org/10.1037/0033-2909.88.3.588

Berssaneti, F. T. and Carvalho, M. M. (2015). Identification of variables that impact project success in Brazilian Companies. *International Journal of Project Management*, *33*(3), 638-649. https://doi.org/10.1016/j.ijproman.2014.07.002

Burgan, S. C. and Burgan, D. S. (2014). One size does not fit all: choosing the right project approach. Paper presented at PMI® Global Congress 2014. North America, Phoenix, AZ. Newtown Square, PA: Project Management Institute. https://bit.ly/3TacAi2

Castro, M. S., Bahli, B., Farias Filho, J. R. and Barcaui, A. (2019). A contemporary vision of project success criteria. *Brazilian Journal of Operations y Production Management*, *16*(1), 66-77. https://doi.org//10.14488/BJOPM.2019.v16.n1.a6

Chu, C. and Bannister, B. J. (1992). Managing information technology projects: Chart (II) development in a large Hong Kong Company. *International Journal of Information Management*, *12*(2), 142-157. https://doi.org//10.1016/0268-4012(92)90020-Q

Correia, S. R. V. and Martens, C. D. P. (2023). Cloud Computing projects: critical success factors. *RAUSP Management Journal*, *58*(1), 5-21. https://doi.org/10.1108/RAUSP-06-2021-0107

Cronbach, L. J. (1951). Coefficient Alpha and the Internal structure of tests. *Psychometrika*, *16*(3), 297-334. https://doi.org//10.1007/BF02310555

de Carvalho, M. M., Patah, L. A. and de Souza Bido, D. (2015). Project Management and its effects on project success: cross-country and cross-industry comparisons. *International Journal of Project Management*, *33*(7), 1509-1522. https://doi.org/10.1016/j.ijproman.2015.04.004

Fornell, C. and Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: algebra and statistics. *Journal of Marketing Research*, *18*(3), 382-388. https://doi.org/10.2307/3150980

Hair, J., Black, W., Babin, B. and Anderson, R. (2018). *Multivariate Data Analysis* (8th ed.). Cengage.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P. and Ray, S. (2021). *Partial least squares structural equation modeling (Pls-Sem) Using R: a workbook*. Springer Nature.

Hu, L. t. and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A MultidisciplinaryJournal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hughes, D. L., Rana, N. P. and Dwivedi, Y. K. (2020). Elucidation of IS Project success factors: an interpretive structural modelling approach. *annals of Operations Research*, *285*(1-2), 35-66. https://doi.org/10.1007/s10479-019-03146-w

Hulland, J. (1999). Use of Partial Least Squares (PLS) in strategic management research: a review of four recent studies. *Strategic Management Journal*, *20*(2), 195-204. https://doi.org/10.1002/(SICI)1097-0266(199902)20:2<195::AID-SMJ13>3.0.CO;2-7

Ika, L. A. (2009). Project success as a topic in project management journals. *Project Management Journal*, *40*(4), 6-19. https://doi.org/10.1002/pmj.20137

Ika, L. A. and Pinto, J. K. (2022). The "re-meaning" of project success: updating and recalibrating for a modern project management. *International Journal of Project Management*, *40*(7), 835-848. https://doi.org/10.1016/j.ijproman.2022.08.001

Ika, L. A. and Pinto, J. K. (2023). Dont Ask what makes projects successful, but under what circumstances they work: recalibrating project success factors. En *Research Handbook on Project Performance* (pp. 75-91). Edward Elgar Publishing.

Iriarte, C. and Bayona, S. (2020). IT Projects success factors: a literature review. *IJISPM-International Journal of Information Systems and Project Management*, *8*(2), 49-78. https://doi.org/10.12821/ijispm080203

Ishfaq, U., Batool, S., Alizai, S. H., Amin, K. and Ali, A. (2022). Organizational commitment, organizational citizenship behavior and turnover intention: the moderating role of leadership behavior. *Central European Management Journal*, *30*(4), 1238-1248. https://doi.org/10.57030/23364890.cemj.30.4.126

Jitpaiboon, T., Smith, S. M. and Gu, Q. (2019). Critical success factors affecting project performance: an analysis of tools, practices, and managerial support. *Project Management Journal*, *50*(3), 271-287. https://doi.org/10.1177/8756972819833545

Khan, K., Turner, J. R. and Maqsood, T. (2013). *Factors that influence the success of public sector pro-*

print ISSN: 1390-6291; electronic ISSN: 1390-8618

jects in Pakistan. Proceedings of IRNOP 2013 Conference.

Khatatbeh, A. A. (2023). Quantifying the impact of ISO 9001 standard on the project and engineering management and success factors; a case of construction industry. *Engineering, Construction and Architectural Management*, *30*(6), 2564-2581. https://doi.org/10.1108/ECAM-07-2021-0656

Lamprou, A. and Vagiona, D. G. (2022). Identification and evaluation of success criteria and critical success factors in project success. *Global Journal of Flexible Systems Management*, *23*(2), 237-253. https://doi.org/10.1007/s40171-022-00302-3

Leung, M. Y., Wei, X. and Wang, C. (2023). Demystifying critical success factors for applying value management in construction projects along the belt and road regions: focus group study. *Journal of Construction Engineering and Management*, *149*(8). https://doi.org/10.1061/JCEMD4.COENG-12990

Mathur, G., Jugdev, K. and Shing Fung, T. (2014). The relationship between project management process characteristics and performance outcomes. *Management Research Review*, *37*(11), 990-1015. https://doi.org/10.1108/MRR-05-2013-0112

Mughal, M. A., Bahaudin, A. Y. and Salleh, N. A. (2019). Behavioral factors for IT Project success in Pakistan: moderating effect of leadership styles. *Management Science Letters*. https://doi.org/10.5267/J.MSL.2019.4.006

Müller, R. and Jugdev, K. (2012). Critical success factors in projects: Pinto, Slevin, and Prescott – the elucidation of project success. *International Journal of Managing Projects in Business*, *5*(4), 757-775. https://doi.org/10.1108/17538371211269040

Müller, R. y Turner, J. R. (2007). The influence of project managers on project success criteria and project success by type of project. *European Management Journal*, *25*(4), 298-309. https://doi.org/10.1016/j.emj.2007.06.003

Müller, R. and Turner, J. R. (2010). Attitudes and leadership competences for project success. *Baltic Journal of Management*, *5*(3), 307-329. https://doi.org/10.1108/17465261011079730

Müller, R. and Turner, J. R. (2010). Leadership competency profiles of successful project managers. *International Journal of Project Management*, *28*(5), 437-448. https://doi.org/10.1016/j.ijproman.2009.09.003

Ng, P. L., Khalfan, M. and Maqsood, T. (2022). Traditional and agile software development project management methodologies. in *managing information technology projects: building a body of knowledge in IT project management* (pp. 71-104). World Scientific.

Nishimwe, C. and McHunu, G. G. (2021). Stakeholders perceptions regarding implementing maternal and newborn health care programs in Rwanda. *BMC Health Services Research*, *21*(1), 796. https://doi.org/10.1186/s12913-021-06824-3

Padilla, W. F., Pino, R. M. and Amaya, A. A. (2021). Factores que impactan en los criterios de éxito de los proyectos en Perú Y Ecuador: el rol moderador de las competencias del director de proyecto. *Información Tecnológica*, *32*, 133-146. https://doi.org/10.4067/S0718-07642021000400133

Pereira, G. S., Novaski, O., Santos Neto, N. F. d. and Mota, F. d. A. d. S. (2022). Study on the state of the art of critical success factors and project management performance. *Gestão y Produção*, *29*. https://doi.org/10.1590/1806-9649-2022v29e4722

Pinto, J. K. (1986). *Project implementation: a determination of its critical success factors, moderators, and their relative importance across the project life cycle*. University of Pittsburgh.

Pinto, J. K. (1990). Project implementation profile: a tool to aid project tracking and control. *international Journal of Project Management*, *8*(3), 173-182. https://doi.org/10.1016/0263-7863(90)90020-C

Pinto, J. K. and Covin, J. G. (1989). Critical Factors in Project Implementation: A Comparison of Construction and RyD Projects. *Technovation*, *9*(1), 49-62. https://doi.org/10.1016/0166-4972(89)90040-0

Pinto, J. K. and Mantel, S. J. (1990). The causes of project failure. *IEEE Transactions on Engineering Management*, *37*(4), 269-276. https://doi.org/10.1109/17.62322

Pinto, J. K. and Prescott, J. E. (1988). Variations in critical success factors over the stages in the project life cycle. *Journal of Management*, *14*(1), 5-18. https://doi.org/10.1177/014920638801400102

Pinto, J. K. and Prescott, J. E. (1990). Planning and tactical factors in the project implementation process. *Journal of Management Studies*, *27*(3), 305-327. https://doi.org/10.1111/j.1467-6486.1990.tb00249.x

Pinto, J. K. and Slevin, D. P. (1987). Critical factors in successful project implementation. *IEEE Transactions on Engineering Management*, (1), 22-27. https://doi.org/10.1109/TEM.1987.6498856

Pinto, J. K. and Slevin, D. P. (1988). Project success: definitions and measurements techniques. *Project Management Journal*, *19*(1), 67-72. https://bit.ly/42Vu59d

Pinto, J. K. and Slevin, D. P. (1989). Critical success factors in RyD projects. *Research-technology management*, *32*(1), 31-35. https://bit.ly/42XYWlh

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y. and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879

Pollack, J., Helm, J. and Adler, D. (2018). What is the iron triangle, and how has it changed? *International Journal of Managing Projects in Business*, *11*(2), 527-547. https://doi.org/10.1108/ijmpb-09-2017-0107

Ringle, C. M., Wende, S. and Becker, J. M. (2022). SmartPLS 4 (computer software). https://bit.ly/3UV1Ghp

Rosacker, K. M. and Olson, D. L. (2008). Public sector information system critical success factors. *Transforming Government: People, Process and Policy*, *2*(1), 60-70. https://doi.org/10.1108/17506160810862955

Rusare, M. and Jay, C. I. (2015). The Project implementation profile: a tool for enhancing management of Ngo projects. *Progress in Development Studies*, *15*(3), 240-252. https://doi.org/10.1177/1464993415578976

Sanchez, O. P., Terlizzi, M. A. and de Moraes, H. R. D. O. C. (2017). Cost and Time project management success factors for information systems development projects. *International Journal of Project Management*, *35*(8), 1608-1626. https://doi.org/10.1016/j.ijproman.2017.09.007

Sepúlveda-Rivillas, C.-I., Alegre, J. and Oltra, V. (2022). Impact of Knowledge-Based Organizational Support on Organizational Performance through Project Management. *Journal of knowledge Management*, *26*(4), 993-1013. https://doi.org/10.1108/JKM-12-2020-0887

Shenhar, A. and Holzmann, V. (2017). The Three Secrets of Megaproject Success: Clear Strategic Vision, Total Alignment, and Adapting to Complexity. *Project Management Journal*, *48*(6), 29-46. https://doi.org/10.1177/875697281704800604

Sinesilassie, E. G., Tripathi, K. K., Tabish, S. Z. S. and Jha, K. N. (2019). Modeling Success Factors for Public Construction Projects with the SEM Approach: Engineer's Perspective. *Engineering, Construction and Architectural Management*, *26*(10), 2410-2431. https://doi.org/10.1108/ECAM-04-2018-0162

Slevin, D. P. and Pinto, J. K. (1986). The project implementation profile: new tool for project managers. *Project Management Journal*, *18*, 57-70. https://bit.ly/3SPSA2V

Slevin, D. P. and Pinto, J. K. (1987). Balancing strategy and tactics in project implementation. *Sloan Management Review*, *29*(1), 33-41. https://bit.ly/3uXwP9f

Thomas, G. and Fernández, W. (2008). Success in IT projects: a matter of definition? *International Journal of Project Management*, *26*(7), 733-742. https://doi.org/10.1016/j.ijproman.2008.06.003

Thompson, B. (2004). Exploratory and confirmatory factor analysis: understanding concepts and applications. *Washington, DC*, *10694*(000), 3.

Tilburg, U. and Hambleton, R. K. (1996). Translating tests: some practical guidelines. *European Psychologist*, *1*(2), 89-99. https://doi.org/10.1027/1016-9040.1.2.89

Varajão, J., Magalhães, L., Freitas, L. and Rocha, P. (2022). Success Management – from theory to practice. *International Journal of Project Management*, *40*(5), 481-498. https://doi.org/10.1016/j.ijproman.2022.04.002

Wangsa, K., Chugh, R., Karim, S. and Sandu, R. (2022). A Comparative study between design thinking, agile, and design sprint methodologies. *International Journal of Agile Systems and Management*, *15*(2), 225-242. https://doi.org/10.1504/IJASM.2022.124916

Watkins, M. W. (2021). *A step-by-step guide to exploratory factor analysis with SPSS*. Routledge.

Williams, T. (2016). Identifying success factors in construction projects: a case study. *Project Management Journal*, *47*(1), 97-112. https://doi.org/10.1002/pmj.21558

Yasin, M. M., Gomes, C. F. and Miller, P. E. (2009). Characteristics of Portuguese public-sector project managers: toward closing the effectiveness gap. *Project Management Journal*, *40*(3), 47-55. https://doi.org/10.1002/pmj.20114

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Retos
Revista de Ciencias de Administración y Economía

april-september 2024
pp.143-159
https://doi.org/10.17163/ret.n27.2024.10

Banking regulatory framework in Ecuador and its impact on SME financing

Marco regulatorio bancario en Ecuador y su impacto en el financiamiento a pymes

Armando José Urdaneta-Montiel
Professor at Universidad Metropolitana, Ecuador
aurdaneta@umet.edu.ec
https://orcid.org/0000-0002-9825-9453

Ángel Alberto Zambrano-Morales
Professor at Universidad Metropolitana, Ecuador
azambrano@umet.edu.ec
https://orcid.org/0000-0002-7897-7327

Received on: 20/12/23 **Revised on**: 08/01/24 **Approved** on: 23/02/24 **Published** on: 01/04/24

Abstract: the research, with a quantitative epistemological approach and the positivist paradigm, aims to define the relationship between the regulatory framework of the Ecuadorian financial sector and the financing conditions for SMEs. This was of a descriptive-correlational type, allowing a descriptive and factorial analysis of variables linked to the knowledge and application of laws and regulatory codes of 54 credit officers from the banking sector of El Oro, Ecuador. Two dimensions were identified: one related to the monetary regulatory framework and another with organic codes. Surveys indicate that the most applied laws are: General Law of Financial Sector Institutions and Companies Law. The first regulates the creation, operation and closure of private financial institutions to protect the population and ensure financial stability; Its compliance is supervised by the Superintendency of Banks. The second simplifies the business incorporation process, allowing various types of companies and flexibility in their structure. Ecuadorian banking regulations have undergone reforms to strengthen the soundness and transparency of the system, such as the Securities Market Law and the Law of Institutions of the Private Insurance System, which contribute to stability, regulation, financial consumer protection and promotion of competition, generating favorable financing conditions, which include confidence, competitive interest rates and broad financial options.

Keywords: regulatory framework, financial system, financing for SMEs, financial consumer, latent variable.

Resumen: la investigación, con enfoque epistemológico cuantitativo y el paradigma positivista, tiene como objetivo definir la relación entre el marco regulatorio del sector financiero ecuatoriano y las condiciones de financiamiento a las pymes. Esta fue de tipo descriptivo-correlacional, permitiendo realizar un análisis descriptivo y factorial de variables vinculadas al conocimiento y aplicación de leyes y códigos regulatorios de 54 oficiales de crédito del sector bancario de El Oro, Ecuador. Se identificaron dos dimensiones: una relacionada con el marco regulatorio monetario y otra con códigos orgánicos. Las encuestas señalan que las leyes más aplicadas son: Ley General de Instituciones del Sector Financiero y Ley de Compañías. La primera regula la creación, funcionamiento y cierre de instituciones financieras privadas para proteger a la población y asegurar la estabilidad financiera; su cumplimiento es supervisado por la Superintendencia de Bancos. La segunda simplifica el proceso de constitución de empresas, permitiendo diversos tipos de compañías y flexibilidad en su estructura. Las regulaciones bancarias ecuatorianas han experimentado reformas para fortalecer la solidez y transparencia del sistema, como la Ley de Mercado de Valores y la Ley de Instituciones del Sistema de Seguros Privados, que contribuyen a la estabilidad, regulación, protección al consumidor financiero y promoción de la competencia, generando condiciones de financiamiento favorables, que incluyen confianza, tasas de interés competitivas y amplias opciones financieras.

Palabras clave: marco regulatorio, sistema financiero, financiamiento a pymes, consumidor financiero, variable latente.

Suggested citation: Urdaneta-Montiel, A. J. and Zambrano-Morales, Á. A. (2024). Banking regulatory framework in Ecuador and its impact on SME financing. *Retos Revista de Ciencias de la Administración y Economía, 14*(27), 143-159. https://doi.org/10.17163/ret.n27.2024.10

Introduction

The most common financing options for small businesses in Ecuador include bank loans, investment funds, business accelerators, and government programs. However, accessing is a challenge, especially for start-ups or those with high risk profiles. For Feijó *et al*. (2023), these companies are crucial for the development of countries, and face challenges in accessing external credits due to the asymmetry of information between lenders and borrowers. The authors raise five trust profiles among 1,033 financial institution entrepreneurs, which influence their financing decisions. The five behavioral models are "skeptical," "complacent," "bold," "improvised," and "weak," with distinct attitudes toward financing, highlighting limitations in traditional financial approaches. Given the political implications, it is crucial to provide entrepreneurial training and encourage collaboration between entrepreneurs and companies.

Espinoza (2020) highlights the importance of Small and Medium Enterprises (SMEs) for Ecuador, the behavior of bank credit and its limitations, such as lack of guarantees, informality and high financing costs. It exposes the dominance of private banking in the financial system and that credit is destined for large companies; it also indicates that there is an increase in the amount of productive credit, but low participation of SMEs. Commercial credit is increasing, although companies do not have access to it. On the contrary, public banks allocate more funds to SMEs, but access is limited. Loans have attractive interest rates and convenient repayment plans, yet the amount of their active operations is low compared to GDP.

Promoting financial inclusion at the global level is a key objective of the Sustainable Development Goals set out in the 2030 Agenda (Acosta, 2019). According to the author, more than 2 billion adults lack access to banking services, and more than 200 millions of micro, small and medium-sized enterprises face difficulties in obtaining financing. In Ecuador, in 2014, only 46.2% of the population over the age of 15 had a bank account. The financial institutions examined demonstrate a commitment to corporate social responsibility and use financial inclusion as a strategy to differentiate themselves and gain competitive advantage, which has contributed to improving access to and use of financial products and services during 2016.

Ecuadorian SMEs face difficulties in obtaining credit. Companies in the chemical and pharmaceutical industries need to develop innovation to thrive in a global competitive environment, and access to credit is vital to finance working capital (Anzules and Novillo, 2023). Being able to adapt to market changes is essential to boost innovation, implementing public policies that promote investment in R&D in SMEs, and the protection of intellectual property.

The technical efficiency of the banking sector is paramount; Proaño and Feria (2022) analyzed 24 Ecuadorian financial institutions during 2015-2019, using data envelope analysis (DEA) to determine efficiency in two scenarios: interest income and other operating income. The average technical efficiency was 84.26% under interest income, and 73.22% under other operating income. Large banks show higher efficiency levels than medium and small banks; 80% of banks have room to improve their efficiency. A 1% increase in efficiency would increase the size of the sector by USD 605 million (Proaño and Feria, 2022).

In this context, social entrepreneurship as part of the dynamics in which SMEs operate is a topic to explain how to increase social wealth through the creation and management of innovative companies with social impact (Bacuilima *et al*., 2023), which are affected by lack of financing. It is emphasized that, in most of the social enterprises studied, impact investing has no role, although social entrepreneurs know the concept.

Moreover, Manaces *et al*. (2023) suggest that, during the post-COVID era, the state develop public policies to foster the popular and solidarity economy, provide job and financial opportunities to marginalized communities and sectors, and decentralize corporate power. This economy is constitutionally recognized in Ecuador as a viable alternative to promote sustainable development, which meets needs and generates income, and prioritizes solidarity and cooperation, over monopoly and capitalist corporatism.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Literature review

When examining the impact of voluntary external audits on SMEs in Argentina, Brazil, Colombia and Mexico, Briozzo and Albanese (2020) show that the financial statements are positive for accessing to bank financing, fixed asset investment and percentage of working capital financed with suppliers, for companies not subject to mandatory audits. The results contribute to the policy debate on the importance of voluntary audit for SMEs in emerging economies, with weaker institutions and greater information asymmetries. The relevance of audit quality review systems is highlighted, which suggest investigating the perceptions and limitations of the reports for external users.

For their part, Corredera . (2021) highlight the relevance of SMEs in the global economy, especially during the COVID-19 pandemic. They analyze the Spanish guarantee model and the actions of regional governments and mutual guarantee societies (MGSs) to address the economic problems arising from the pandemic. These guarantee schemes allow public administrations to improve SMEs' access to finance without increasing the burden on the public budget.

In the Ecuadorian business scenario, SMEs are governed by the Organic Law of Entrepreneurship and Innovation (2021), which establishes three categories:

- Micro-enterprises: up to nine workers. Net annual income less than $100,000.
- Small businesses: between 10 and 50 employees. Net annual sales between $100,001 and $1,000,000.
- Medium-sized enterprises: from 51 to 200 workers. Net annual sales between $1,000,001 and $5,000,000.

This classification provides a clear legal framework for the business sector, facilitating regulation and appropriate support to SMEs.

Zhavoronok . (2022) investigate the regulatory framework of the banking sector in Ecuador and its impact on SME financing. They provide deep insights into the factors that contribute to unpaid loans and lay valuable theoretical foundations. They highlight the development of the credit market and how crises in the sector affect stability and financing conditions. In the Ecuadorian context, regulatory reforms have strengthened the banking system and promoted competition.

In many economies, SMEs are key because of their contribution to employment and Gross Domestic Product (GDP), as Mpofu and Bongani (2022) put it. Yet in African countries, these firms have been systematically excluded from the formal financial system. Given this, the informal financial sector emerges as a source of financing, especially when they cannot access formal finance because of information asymmetry, lack of collateral, and high default rates. It is noted that some entrepreneurs prefer informal financing because of its flexibility and simpler administrative procedures.

Although informal financing has advantages because of high lender interest rates, it has constraints on available resources that prevent it from serving companies with large amounts that do not qualify for formal financing. It is suggested to establish regulations for the informal financial sector; in addition, that SMEs improve their risk management practices and use FinTech platforms to access credit (Mpofu and Bongani, 2022).

In this regard, Amadasun and Mutezo (2022) investigated the factors related to access to financing that influence the growth of SMEs in Lesotho. Entrepreneurs and managers perceive the requirements of guarantees, access to financial information and banking support services as critical barriers that limit their competitiveness; they also depend on the use of financial technologies and other non-bank sources that improve their financial situation.

In this line, Łasak (2022) points out the financing gap in the traditional financial system and highlights the use of financial technologies as a stimulus to finance SMEs in developing countries. They underline the importance of microfinance and crowdfunding. It provides inputs for policy support in the post-pandemic era and provides information on corporate financing. It also explores the impact of FinTech-based entities in developing countries, a subject under-researched.

The study by Liu *et al*. (2022) analyzes the relationship between business environment, economic growth and financing sources of Chinese SMEs, determining their relevance for technological SMEs. They indicate that financing (formal and informal), under the banking structure and fiscal regulation, can boost standard credit options and reduce informal credit options, impacting GDP growth. This study is the first to examine asymmetric information and institutional theory in relation to SME financing in China. It highlights the importance of improving data collection on these companies, to develop policies to support economic challenges, such as those of the COVID-19 pandemic (Liu *et al*., 2022).

A study of 856 SMEs in Vietnam by Lam *et al*. (2022) found that credit quality, supply chain integration, exchange, and information technology affect supply chain financing. Market responsiveness and innovation act by mediating the relationship between supply chain financing and financing performance, which is crucial in an export economy like Vietnam. The government should develop policies to access capital and increase participation in global supply chains. The banking sector should improve transparency and the ability to finance them, while companies should focus on optimizing them and strengthening cooperation with partners.

Van *et al*. (2021) and Bakhtiari *et al*. (2020) highlight the role of agency theory and information asymmetry in SME financing in Vietnam, as well as the relevance of financial infrastructure and tax regulations. They also emphasize the importance of SMEs in OECD economies, and address challenges related to access to credit and its impact on employment, productivity and wages.

In examining the effects of access to credit and fiscal structures on the performance of manufacturing SMEs in Malaysia, Cheong *et al*. (2020) apply the Momentum Generalized Method of Dynamic Panel System to monitor business and macroeconomic effects. It was found that debt financing does not benefit SMEs, while access to non-bank credit sources and tax incentives do improve their performance by reducing the opportunity costs of riskier but lucrative projects. Tax policies in Malaysia hinder SME growth and can incentivize misleading accounting practices to reduce tax liabilities, leading investors to prefer companies with more conservative approaches to accounting and tax status.

Furthermore, Motta and Sharma (2019) highlight that in the hotel sector in Brazil, lack of access to financing limits participation in the local economy, as does the asymmetry of information between borrowers and lenders. It examines the impact of fixed-asset-backed loans (preferred technology), and financial-statement-based loans, and how these mitigate information asymmetries and increase the likelihood of financing.

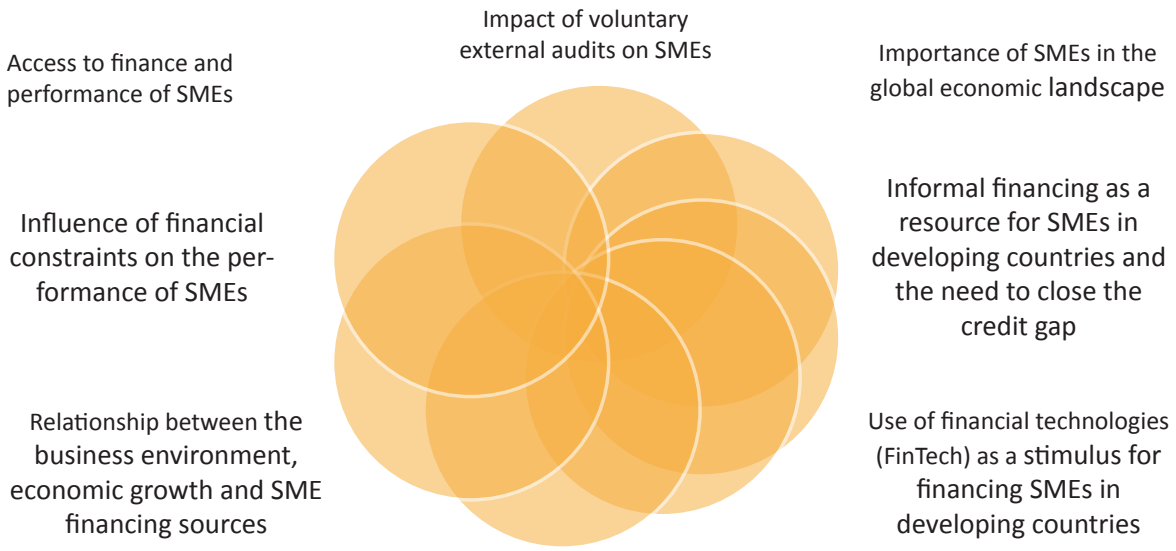
Financial innovation, technological adaptation and government support are important for the growth of SMEs; the cessation of their operations negatively affects employment. In that regard, Pu *et al*. (2021) cite current challenges, such as limited market demand, supply constraints, financial incapacity and capital constraints.

On the impact of the global financial crisis on SMEs and unlisted companies, Demirguc *et al*. (2019) found that these experienced significant changes in their capital structure, while large and listed companies had moderate changes. More indebted and less productive firms were hit harder. This suggests that SMEs and unlisted companies are more vulnerable to a financial crisis, because they depend on selective banking relationships and their intrinsic opacity. The authors suggest implementing better policies to access finance and increase transparency and financial reporting.

Figure 1 shows the theoretical categories drawn from the literature. The impact of voluntary external audits on SMEs in developing countries can improve investor and lender confidence, increasing the chances of accessing formal financing and closing the credit gap.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Figure 1
Theoretical categories drawn from the literature review



Páez *et al*. (2021) explore the regulatory framework of the Ecuadorian financial sector and its deregulation, showing that deregulation leads to greater financial sector concentration, mass migration, and affects the productive structure and financial stability. The authors advocate a methodological shift, incorporating alternative economic theories such as those of Schumpeter and Marx.

Mejía-Escobar *et al*. (2020) compare the regulatory framework of the banking sector and the financing conditions for SMEs. They analyze how government regulations affect financial practices, and highlights their importance in the stability and transparency of the financial system. The experience of other Latin American countries offers alternatives to assess the impact of the regulatory framework on SMEs in Ecuador, and can serve as models to strengthen the framework, especially in stability, regulation and financial consumer protection.

Meanwhile, Ahmed *et al*. (2021) highlight factors such as capital adequacy, asset quality, credit standards, and effective monitoring processes to reduce unpaid loan risks. In this context, the Ecuadorian regulatory framework establishes capital requirements, guidelines for lending policies, monitoring regulations, and operational efficiency. It is suggested that effective government and comprehensive regulation minimize unpaid loans, which influence risk management in the banking sector and financing of Ecuadorian SMEs.

Figure 2 shows the elements that influence SME financing, according to the literature. Financial technology and innovation improve access to finance, thanks to FinTech platforms that offer innovative and efficient solutions. On the other hand, information asymmetries affect the decision-making of lenders and investors, generating greater perception of risk; financial transparency is key to reduce them.

Figure 2
Elements that influence SME financing, according to the literature review

According to Beck (2008), the "Access to Financing Theory", is influenced by factors such as: economic situation, credit risk and regulation. Favorable credit conditions support investment, employment and economic growth. A strong regulatory framework and appropriate policies to access finance are key to promoting financial competition and would stimulate the creation of new businesses and start-ups, also vital for innovation and growth. Well-funded companies can invest in technology, training, and in expanding their operations. This reflects the importance of this theory in the economic field, highlighting the relationship between access to credit, entrepreneurship, innovation and economic growth (Contractor , 2021).

Materials and methods

This research, from a quantitative epistemological view and a positivist paradigm (Hurtado, 2012), studies a causal relationship between two or more variables. It is descriptive-correlational, supported by a transectional, correlational, field and documentary design (Hernández *et al.*, 2016), which identifies patterns, trends and possible relationships; it is flexible, unstructured and does not seek to test a specific hypothesis, but to obtain initial understanding of the phenomenon (Bruner, 2018). Associative and dependent relationships were sought between the latent variables: access to credit requirements, financing conditions, monetary regulatory framework and organic codes.

A tool (survey) was designed and applied to 54 credit officers of the province of El Oro, during the first half of 2023, out of 62 accessible. For this purpose, the sample size for finite populations was calculated, with 5 % error and 95 % confidence level, following the criterion of maximum variance (Kumar, 2022), using the following equation:

$$n = \frac{Nt^2pq}{e^2(N-1) + t^2pq} =$$

$$\frac{62(1{,}96)^2(0{,}5)(0{,}50)}{0{,}05^2(62-1) + (1{,}96)^2(0{,}50)(0{,}50)} = 53{,}59 \approx 54$$

print ISSN: 1390-6291; electronic ISSN: 1390-8618

The survey consisted of 48 items of combined scale. A qualitative evaluation of 16 indicators (observable variables) covering four dimensions (latent variables) was performed. These were identified through factor analysis (Table 1), which revealed the joint variation of the observed variables, contributing to reduce their complexity and describe their underlying structure (Sellbom and Tellegen, 2019).

To ensure the reliability of the sample, Cronbach's Alpha coefficient was used. Regarding the validity of the instrument, a discriminant analysis of items was performed using the t-Student test, which verified its relevance (Johnson and Wichern, 2022).

Table 1

Research Instrument (2022) and development 2023, version 26 of the SPSS software.

Latent variables	Observed variables	No. items
Monetary Regulatory Framework	Banks Act	3
	Companies Act	3
	Organic Law of Entrepreneurship and Innovation	3
Organic Codes	Organic Monetary and Financial Code	3
	Organic Code of Planning and Public Finance	3
	Organic Code of Production, Trade and Investment	3
Financing conditions	Interest rates	3
	Timelines	3
	Amortization	3
Credit access requirements	Strategic planning	3
	Results Statements	3
	Overall balance	3
	Cash flow statements	3
	Statement of changes in equity	3
	Income tax return	3
	Value-added tax declaration	3

Note. Research Instrument (2022) and development 2023, version 26 of the SPSS software.

Table 2 contains the definition of the latent variables for SMEs, as consulted by the above sources.

Table 2

Definition of the latent variables of the banking sector in Ecuador related to SMEs

Latent variable	Definition
Monetary Regulatory Framework	A set of laws, regulations, and guidelines that govern the monetary and financial activities of the Ecuadorian banking sector. It encompasses the legal framework that establishes rules for the creation, operation and closure of financial institutions, as well as regulations related to currency issuance, reserve requirements, monetary policy and prudential standards. It reflects the legal and institutional foundation that ensures the stability, transparency and proper functioning of the monetary and financial system in the country (Asamblea Nacional del Ecuador, 2018).
Organic Codes	It represents the compilation of several organic codes that regulate specific aspects of economic and financial activities in Ecuador. They cover laws related to entrepreneurship, innovation, planning, public finance, production, trade and investment. It reflects the legal and regulatory framework that guides the banking sector in its practices and procedures related to credit assessment, risk management and lending activities based on the principles of these organic codes (Asamblea Nacional del Ecuador, 2018).

Latent variable	Definition
Financing Conditions	Terms, conditions and criteria for financing SMEs by the banking sector. It covers interest rates, collateral requirements, payment terms and eligibility criteria for companies seeking loans or credit facilities. It reflects the overall picture of available financial opportunities, including favorable conditions for the access to finance (Feijó *et al*., 2023).
Credit Access Requirements	It involves SMEs' requirements and criteria for obtaining credit or loans. It covers factors such as documentation, financial history, credit worthiness, business plans, and regulatory compliance. It captures the challenges and barriers that these companies face when seeking bank loans, and reflects how the credit granting process of the banking sector aligns with their needs and capabilities (Álvarez *et al*., 2023).

Results and discussion

On average, 55.86% of credit executives surveyed know the laws and organic codes considered, of which 48.08% use them in their work and 70.02% of them are useful, i.e., 18.81% of the total (Table 3).

Table 3
Knowledge and application of laws and codes by the credit executives surveyed

Laws or codes	Know the laws (%)	Uses the laws in his functions (%)	Knowing the laws is useful (%)
Organic Law of the Financial System (Law of Banks)	72.22	66.70	83.10
Companies Act	64.81	55.00	74.00
Organic Monetary and Financial Code	62.96	53.70	75.90
Organic Law of Entrepreneurship and Innovation	44.44	31.50	59.30
Organic Code of Planning and Public Finance	40.74	33.30	59.20
Organic Code of Production, Trade and Investment	50.00	48.30	68.60
Average	55.86	48.08	70.02

Note. Research instrument (2022).

The analysis of correlations and covariances indicates that the latent variable *Monetary Regulatory Framework* shows no degree of linear association or dependence with the rest of the factors, but it does show correlation and covariation between them (table 4). However, all the latent variables were considered in the analysis of structural equation models (SEM) that analyzes relationships between observed and unobserved variables. However, its construction and estimation require adequate planning and data due to its complexity and computational use (Karakaya-Ozyer and Aksu-Dunya, 2018).

Table 4
Correlations and covariances between latent variables

		Credit access requirements	Financing conditions	Monetary Regulatory Framework	Organic Codes
Credit access requirements (F4)	Pearson correlation	1	.538**	0.036	.598**
	Sig. (Bilateral)		0.000	0.795	0.000
	Covariance	1.000	0.538	0.036	0.598
	N	54	54	54	54

print ISSN: 1390-6291; electronic ISSN: 1390-8618

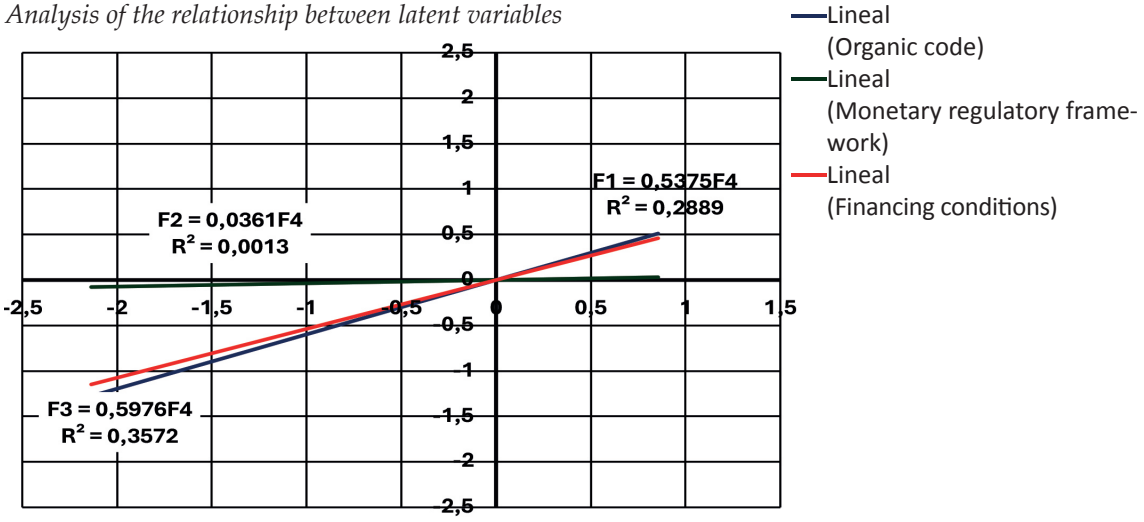
		Credit access requirements	Financing conditions	Monetary Regulatory Framework	Organic Codes
Financing conditions (F3)	Pearson correlation	.538**	1	-0.013	.460**
	Sig. (Bilateral)	0.000		0.925	0.000
	Covariance	0.538	1.000	-0.013	0.460
	N	54	54	54	54
Monetary Regulatory Framework (F2)	Pearson correlation	0.036	-0.013	1	0.000
	Sig. (Bilateral)	0.795	0.925		1.000
	Covariance	0.036	-0.013	1.000	0.000
	N	54	54	54	54
Organic codes (F1)	Pearson correlation	.598**	.460**	0.000	1
	Sig. (Bilateral)	0.000	0.000	1.000	
	Covariance	0.598	0.460	0.000	1.000
	N	54	54	54	54

Note. Research Instrument (2022) and development 2023, version 26 of the SPSS software.

Figure 3 shows a positive relationship between the rest of the factors and the latent variable explained by the SEM model (*Credit Access Requirements*), to the extent that credit executives have greater knowledge and applicability of laws and codes, financing conditions and credit access requirements that conform the regulatory legal framework.

Figure 3

Analysis of the relationship between latent variables



Note. Research Instrument (2022) and development 2023, version 26 of the SPSS software.

The following scale was used to characterize the latent variables (Table 5):

Table 5
Escala de interpretación de las variables latentes

Rank	Qualification
(5-4,2)	Excellent
(4,2-3,4)	Good
(3,4-2,6)	Regular
(2,6-1,8)	Poor
(1,8-1)	Very Poor

Note. Research Instrument (2022) and Development Instrument (2023), SPSS version 26.

Table 6 shows that variables F4, F2 and F1 qualified as Regular, and F3 as Good. The goal is to achieve levels of excellence, which requires greater knowledge and application by credit executives.

Table 6
Descriptive statistics of latent variables

	N	Average	Standard deviation	Qualitative assessment
Financing conditions (F3)	54	3,5185	1,05938	Good
Organic Code (F1)	54	3,3815	1,05938	Regular
Monetary Regulatory Framework (F2)	54	3,3815	1,04142	Regular
Requirement for accessing to credit (F4)	54	3,3259	0,90286	Regular
N valid (per list) 54				

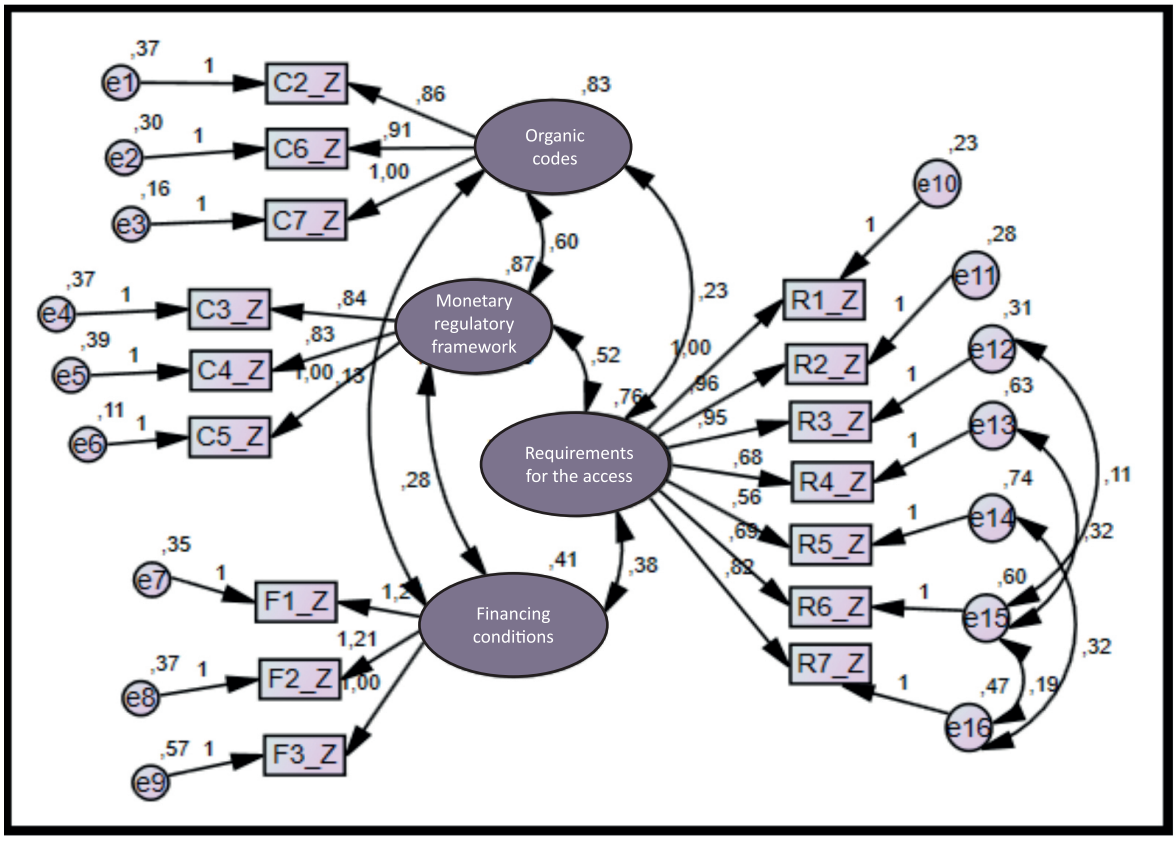
Note. Research instrument (2022) and elaboration (2023), SPSS software version 26.

A model of structural equations was created with the sixteen observable variables to analyze which significantly influences variable F4. Figure 4 shows the measurement model, which is recursive, and comprises four explanatory latent variables along with their observable variables. These represent the links between the model indicators and their latent constructs, as well as the covariance relations between the latent variables (Vogt, 2015).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Figure 4

Measurement model for the covariance analysis of latent variables and their dependence relations



Note. Data analyzed with AMOS IBM SPSS (Byrne, 2021).

Table 7 presents the validation of the measurement model built using AMOS. The absolute adjustment indicators PClose and RMSEA rank Excellent, based on Byrne (2021) criteria, as do the absolute adjustment indicator, the parsimony indicator (CMIN/DF) and the incremental adjustment indicator (IFC).

Table 7

Validation of the adjustment of the measurement model with respect to the latent variables and their dependency relations

Measurement	Estimate	Threshold	Interpretation
CMIN	108,726	--	--
DF	94	--	--
CMIN/DF	1.157	Between 1 and 3	Excellent
IFC	0.972	> 0.95	Excellent
RMSEA	0.054	< 0.06	Excellent
Pclose	0.423	> 0.05	Excellent

Note. Research Instrument (2022) and Development Instrument (2023), SPSS version 26.

The analysis focuses on a model of structural equations (SEM) that has been adjusted using the "FIT" criterion, which evaluates the congruence between the observed data and the theoretical model (Henseler *et al*., 2021).

The Chi-square value (108,726) suggests significant differences between the observed data and those predicted by the model. The degrees of freedom (DF=94) show the number of adjustable values according to the model. The Chi-square/degrees of freedom ratio (CMIN/DF = 1.157) indicates that the fit might not be optimal, deviating from ideal (about 1). Meanwhile, the Comparative Fit Index (CFI=0.972), which compares the model fit with one without relationships between variables, suggests a good fit compared to null.

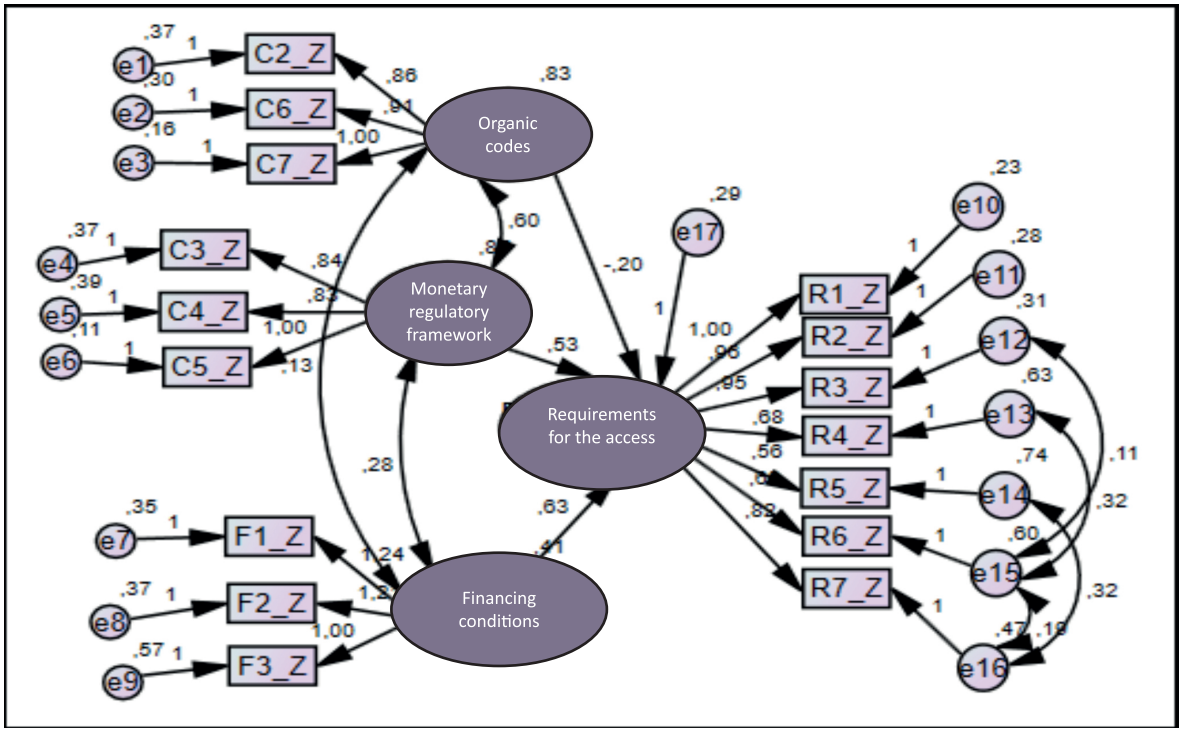
According to Gana and Broc (2021), the Middle Square Root Approximation Error (RMSEA=0.054) measures the adjustment by degree of population freedom; its low value implies a reasonable adjustment. The Significance Test (Pclose=0.423), whose value is not significantly different from zero, suggests a reasonable adjustment. The results show a reasonable adjustment of the SEM model.

The SEM for estimating the latent variable F4, generated by the AMOS IBM SPSS software, shows a match between the implicit covariance matrix in the model, and the real covariance matrix derived from the empirical data (Figure 5).

Defined the model and established the empirical covariance matrix, a parameter estimation technique is selected (Byrne, 2021). When the estimate reaches a satisfactory convergence, it is essential to assess the adequacy of the model to measure the degree of agreement between the SEM and the actual data analyzed.

Figure 5

Model of structural equations for the estimation of the latent variable F4



Note. Based on the covariances of the identified latent variables. Data analyzed with AMOS IBM SPSS (Byrne, 2021).

Table 8 presents the respecification data of the structural equations model to estimate the latent variable F4, using the covariances of the latent variables, identified in the credit access levels

print ISSN: 1390-6291; electronic ISSN: 1390-8618

of the SMEs of the banking sector of El Oro. The amended Model 4 is the most appropriate adjustment after considering the amendment rates. Absolute adjustment measures, such as RMSEA and PCLOSE, indicate an acceptable adjustment of the model. In line with Hair *et al*. (2021), these metrics clarify the alignment of the structural equation model and the empirical data.

Table 8

Adjustment respecification of the structural equations model to estimate the latent variable F4 (credit access requirements)

	Absolute adjustment measures		Incremental adjustment measures			Parsimony adjustment measures				
Model	**PClose**	**RMSEA**	**IFC**	**TLI**	**NFI**	**PGFI**	**NFIP**	**AIC**	**X2**	**X2/DF**
Reference Model	0,004	0,107	0,886	0,891	0,755	0,527	0,617	233.866	157,87	1,61
MODEL 1 Re-specification e14 <-->e16	0,028	0,093	0,915	0,895	0,78	546	0,631	219.760	141,76	1,46
MODEL 2 Re-specification e13 <-->e15	0,148	0,075	0,945	0,931	0,906	0,562	0,645	204.997	124,99	1,3
MODEL 3 Re-specification e15 <-->e16	0,332	0,061	0,964	0,955	0,824	0,565	0,652	195.699	113,69	1,19
MODEL 4 Re-specification e12 <-->e15	0,423	0,054	0,972	0,964	0,832	0,565	0,651	192.726	108,73	1,16

Note. Based on the covariances of the latent variables in the levels of access to credit by SMEs for the banking sector of El Oro. (Data analyzed with AMOS IBM SPSS, Byrne, 2021).

In relation to descriptive metrics involving model comparisons, they often indicate an optimal or suboptimal fit, and serve as a benchmark for comparison, both the IFC (Comparative Adjustment Index) and the TLI (Tucker-Lewis Index) or the NFI (Normalized Adjustment Index). The CFI (0.972) and TLI (0.964) values indicate optimal model fit (Gana and Broc, 2021).

However, the NFI (0.832) suggests unsatisfactory adjustment; this measure compares the goodness of fit of the proposed model with the goodness of fit of a null one, to determine how well the proposed model fits the data (Henseler *et al*., 2021), cataloging it as suboptimal. However, three adjustments are shown with respect to the comparison model in terms of modification rates.

As long as the values of the parsimony adjustment measures PGFI (Parsimonious Goodness-of-Fit Index = 0.565) and PNFI (Parsimonious Normed Fit Index = 0.651) are closer to 1, they indicate a favorable balance between model complexity and fit to data (Hair *et al*., 2021). On the other hand, the AIC criterion (Akaike Information Criterion = 192,726) indicates the quality of the fit that penalizes the complexity of the model, where lower values indicate a better fit (table 8).

Finally, x2 (Chi-Square – 108.73), which measures the difference between observed data and expected values, and x2/DF (Chi-Square divided by Degrees of Freedom = 1.16) which normalizes this value by dividing it by degrees of freedom, indicate that a value close to 1 of x2/DF is a good fit, although it can be affected by the sample size.

In general, the RMSEA, CFI and TLI measures suggest a good fit of model 4 to the data. However, the measures NFI, PGFI and PNFI indicate that this model is more complex or does not fit the data optimally.

The covariances of the latent variables and the errors of the default model were analyzed. In SEM

models, covariances represent the relationships between latent variables (F1, F2, F3) and their observed indicators (e12, e13, e14, e15, e16). The values of Estimate (estimation), S.E. (standard error), C.R. (contrast ratio) and P (p-value), allow to evaluate the significance of these relationships (table 9).

Table 9

Correlations and covariances between latent variables, El Oro banking sector

Covariances: (Group number 1 - Default model)							Correlations: (Group number 1 - Default model)
			Estimate	S.E.	C.R.	p	Estimate
F1	<-->	F3	0,13	0,098	1,325	0,185	0,223
F2	<-->	F3	0,279	0,114	2,451	0,014	0,466
F2	<-->	F1	0,598	0,156	3,842	***	0,707
e14	<-->	e16	0,325	0,093	3,502	***	0,551
e13	<-->	e15	0,315	0,087	3,642	***	0,513
e16	<-->	e15	0,194	0,058	3,337	***	0,369
e12	<-->	e15	0,111	0,052	2,155	0,031	0,260

Note. Based on data analyzed with AMOS IBM SPSS (Byrne, 2021). (***) indicates values < 0.001

As a result:

- F1 <--> F3: the relationship is not significant, the p-value > 0.05. It is inferred that they do not have significant statistical covariation.
- F2 <--> F3: significant relationship (p < 0.05), evidencing dependence relationship.
- F2 <--> F1: p < 0.001; highly significant relationship.
- e14 <--> e16: P < 0.001; highly significant relationship.
- e13 <--> e15: P < 0.001; highly significant relationship.
- e16 <--> e15: P < 0.001; highly significant relationship.
- e12 <--> e15: p < 0.05; significant relationship.

As for the correlations between the different variables in the SEM model, unlike covariances, these are normalized and vary in the range from -1 to 1. It is noted that:

- F1 <--> F3: positive and moderate correlation (0.223).
- F2 <--> F3: positive correlation (0.466); its relation is stronger than between F1 and F3.
- F2 <--> F1: positive and high correlation (0.707). It indicates a strong and meaningful relationship.
- e14 <--> e16: indicates positive, significant and moderate relationship.
- e13 <--> e15: positive correlation.
- E16 <--> E15: weak positive correlation compared to previous ones.
- E12 <--> E15: positive and significant correlation, although it is the weakest observed (0.26).

These correlations indicate that there are associations between the corresponding variables of the SEM model. The strength and direction may vary and should be interpreted in the context of the underlying theory and research design.

The latent variables F1 and F3 were significant to explain F4 (table 10); p-value < 0.05 with significance level of 5 %, and confidence interval of 95 % (F_4=0.53*F_1-0.20*F_2+0.63*F_3).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Table 10

Regression model coefficients for the latent variable F4 (credit access requirements)

Regression Weights: (Group number 1 - Default model)							Standardized Regression Weights: (Group number 1 - Default model)			
			Estimate	H.E.	C.R.	P				Estimate
F4	<---	F1	0,53	0,193	2,744	0,006	F4	<---	F2	0,57
F4	<---	F2	-0,20	0,169	-1,17	0,242	F4	<---	F1	-0,21
F4	<---	F3	0,63	0,222	2,821	0,005	F4	<---	F3	0,46

Note. Based on data analyzed with AMOS IBM SPSS (Byrne, 2021).

Complex relationships are revealed between the latent variables in the El Oro banking sector, in terms of the requirements for accessing to credit (F4). Correlations show moderate association with financing conditions (F3) and strong relationship with organic codes (F1), while the relationship with the monetary regulatory framework (F2) is minimal. These findings highlight the significant influence of organic codes and financing conditions on access to credit requirements.

As for the regression coefficient model, the variable F3 has the greatest influence on F4, followed by the organic codes. On the other hand, the relationship between F2 and F4 is less influential and does not reach statistical significance. However, F1, F2 and F3 show positive association with F4.

These results underline the importance of financing conditions and organic codes in determining the requirements for accessing to credit in El Oro banking sector. In addition, they provide valuable information to understand how policies and regulations influence access to credit, as well as to identify areas for improvement in the local financial system.

The literature highlights that Ecuadorian small businesses face significant challenges in accessing external financing (Feijó *et al*., 2023). This study identifies five trust profiles that influence financing decisions, highlighting the importance of addressing information asymmetry between lenders and borrowers. In addition, Espinoza (2020) highlights the limitations of bank credit to Ecuadorian SMEs, including the lack of guarantees and high financing costs. Acosta (2019) highlights the relevance of financial inclusion in the context of the Sustainable Development Goals, underscoring the need to improve access to financial services for businesses and the general population.

In the regulatory field, Zhavoronok *et al*. (2022) and Páez *et al*. (2021) analyze the regulatory framework of the Ecuadorian banking sector and its effects on SME financing. They stress the importance of considering micro- and macro-economic aspects, as well as the need for alternative approaches to financial regulation. Integrating the findings of the study with the literature review provides a comprehensive understanding of the challenges and opportunities associated with access to credit in El Oro banking sector. These results can be used to design policies and strategies aimed at improving SMEs' access to finance and promoting sustainable economic development in the region.

Conclusiones

SME financing is essential for economic progress and stability in Latin America, as it is the backbone of many regional economies for generating employment, boosting innovation and fostering economic diversification. However, they face difficulties in accessing loans and the necessary capital due to their size and limited lending capacity, as is the case in Ecuador.

The analysis of variables such as: access to credit requirements, regulatory framework, organic codes and financing conditions, reveals a significant association between them, and highlights the importance of understanding these relationships to improve access to credit and promote sustainable economic growth. However, a lack of understanding of the banking legal framework may hinder this access. It is essential to work on the integra-

tion of the regulatory framework and improve administrative processes to promote economic development in El Oro region, Ecuador.

References

Acosta, G. R. (2019). Responsabilidad social empresarial: Inclusión financiera en el sistema bancario privado ecuatoriano. *Visión de Futuro, 23*(1), 1-11. https://bit.ly/3UUH20S

Ahmed, S., Ejaz Majeed, M., Thalassinos, E. y Thalassinos, Y. (2021). The impact of bank specific and macro-economic factors on non-performing loans in the banking sector: Evidence from an emerging economy. *Journal of Risk and Financial Management, 14*(217). 1-14. https://doi.org/10.3390/jrfm14050217

Álvarez, J., Cabrera, P. y Jácome, H. (2023). Territorial inequalities in financial inclusion: A comparative study between private banks and credit unions. *Socio-Economic Planning Sciences, 87*(Part A). https://doi.org/10.1016/j.seps.2023.101561

Amadasun, D. y Mutezo, A. (2022). Infuence of access to fnance on the competitive growth of SMEs in Lesotho. *Journal of Innovation and Entrepreneurship, 11*(1), 1-20. https://doi.org/10.1186/s13731-022-00244-1

Anzules, W. and Novillo, S. (2023). Innovation capacity, entrepreneurial orientation, and flexibility: an analysis from industrial SMEs in Ecuador. *Sustainability, 15*(13), 1-24. https://doi.org/10.3390/su151310321

Asamblea Nacional del Ecuador. (2018). *Código Orgánico Monetario y Financiero.* Quito, Ecuador.

Asamblea Nacional del Ecuador. (2021). Ley Orgánica de Emprendimiento e Innovación. Suplemento del Registro Oficial No. 151 , 28 de Febrero 2020.

Bacuilima, E., Morocho, J., Aguirre, J., Coronel, K. and Mora, P. (2023). Financing Ecuadorian social enterprises: what is the role of impact investment? *Sustainability, 15*(14), 1-19. https://doi.org/10.3390/su151411210

Bakhtiari, S., Breunig, R., Magnani, L. and Zhang, J. (2020). Financial constraints and small and medium enterprises: a review. *Economic Recor, 96*. 1-8. https://doi.org/10.1111/1475-4932.12560

Beck, T., Demirgüç-Kunt, A. and Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics, 89*(3), 467-487. https://doi.org/10.1016/j.jfineco.2007.10.005

Briozzo, A. and Albanese, D. (2020). Voluntary audit, investment, and financing decisions in Latin American small and medium enterprises. *Journal of International Accounting, Auditing and Taxation, 38*,1-11. https://doi.org/10.1016/j.intaccaudtax.2020.100302

Bruner, J. S. (2018). *Desarrollo cognitivo y educación*. Ediciones Morata.

Byrne, B. M. (2021). *Structural equation modeling with AMOS: basic concepts, applications, and programming*. (4th ed.). Routledge. https://doi.org/10.4324/9781315757421

Cheong, C., Huui, M. and Arul, M. (2020). Credit access, tax structure and the performance of Malaysian manufacturing SMEs. *International Journal of Managerial, 16*(4), 433-454. https://doi.org/10.1108/IJMF-08-2019-0308

Contractor, F. J., Nuruzzaman, N., Dangol, R. and Raghunath, S. (2021). How FDI inflows to emerging markets are influenced by country regulatory factors: an exploratory study. *Journal of International Management, 27*(1). https://doi.org/10.1016/j.intman.2021.100834

Corredera, F., Di Pietro, F. and Trujillo, A. (2021). PostCOVID19 SME fnancing constraints and the credit guarantee scheme solution in Spain. *Journal of Banking Regulation,* (22), 250-260. https://doi.org/10.1057/s41261-021-00143-7

Demirguc, A., Martinez, M. and Tressel, T. (2019). The global financial crisis and the capital structure of firms: Was the impact more severe among SMEs and non-listed firms? *Journal of Corporate Finance, 60*. 1-66. https://doi.org/10.1016/j.jcorpfin.2019.101514

Espinoza, G. (2020). El Crédito Bancario y las Pymes en Ecuador. and*ACHANA, 9*(2), 77-90. https://doi.org/10.62325/10.62325/yachana.v9.n2.2020.649

Feijó, N., Ceular, N. and Navajas, V. (2023). Behavioral patterns that influence the financing choice models of small enterprises in Ecuador through latent class analysis. *Sustainability, 15*(8), 1-17. https://doi.org/10.3390/su15086790

Gana, K. and Broc, G. (2021). *Structural equation modeling: an introduction using R and R-Studio.* Routledge.

Hair, J., Hult, T., Ringle, C., Sarstedt, M., Danks, N. and Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R.* Springer.

Henseler, J., Hubona, G. and Ray, P. A. (2021). Using PLS Path modeling in new technology research: updated guidelines. *Industrial Management & Data Systems, 121*(1), 2-20. https://doi.org/10.1108/IMDS-09-2015-0382

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Hurtado, J. (2012). *Metodología de la investigacion. Guía para la comprension holística de la ciencia.* Quirón ediciones.

Johnson, R. A. and Wichern, D. W. (2022). *Applied Multivariate Statistical Analysis.* Pearson.

Karakaya-Ozyer, K. and Aksu-Dunya, B. (2018). A review of structural equation modeling applications in Turkish educational science literature. *International Journal of Research in Education and Science*, *4*(1), 279-291. https://doi.org/10.21890/ijres.383177

Kumar, K. (2022). *Research Methodology in Social Science.* K.K. Publications.

Lam, T., Nhien, D., Anh, T., Xuan, T., Thuy, T. and Uyen, T. (2022). The impact of supply chain financing on SMEs performance in Global supply chain. *Uncertain Supply Chain Management*, *10*, 255-270. https://doi.org/10.5267/j.uscm.2021.9.003

Łasak, P. (2022). The role of financial technology and entrepreneurial finance practices in funding small and medium-sized. *Journal of Entrepreneurship, Management and Innovation, 18*(1), 7-34. https://doi.org/10.7341/20221811

Liu, Y., Dilanchiev, A., Xu, K. and Merdan, A. (2022). Financing SMEs and business development as new post Covid-19 economic recovery determinants. *Economic Analysis and Policy*, *76*, 554-567. https://doi.org/10.1016/j.eap.2022.09.006

Manaces, G., Rivera, G., Zambrano, M. and Triviño, K. (2023). Constitution of popular and solidary economic organizations in post-pandemic for the Ecuadorian economic reactivation. *Baltic Journal of Law & Politics, 16*(3), 1-10. https://doi.org/10.2478/bjlp-2023-00000111

Mejía-Escobar, J., González-Ruiz, J. and Duque-Grisales, E. (2020). Sustainable financial products in the Latin America banking industry: Current status and insights. *Sustainability, 12*(5648),1-25. https://doi.org/10.3390/SU12145648

Motta, V. and Sharma, A. (2019). Lending technologies and access to finance for SMEs in the hospitality industry. *International Journal of Hospitality Management*, *86*, 1-9. https://doi.org/10.1016/j.ijhm.2019.102371

Mpofu, O. and Bongani, A. (2022). Informal finance: a boon or bane for African SMEs? *Journal of Risk and Financial Management*, (15), 1-15. https://doi.org/10.3390/jrfm15060270

Páez Pérez, P., Jaramillo Vasconez, O. and Ramírez González, R. (mayo de 2021). Concentración y tasas de interés en el sistema financiero ecuatoriano. *Economía, 73*(1), 93-104. https://doi.org/10.29166/economia.v73i117.2629

Proaño, B. and Feria, J. (2022). Are Ecuadorian banks enough technically efficient for growth? A clinical study. *WILEY*, 1-19. https://doi.org/10.1002/ijfe.2775

Pu, G., Qamruzzaman, M., Muneeb, A. N. and Karim, S. (2021). Innovative finance, technological adaptation and SMEs Sustainability: the mediating role of government support during COVID-19 Pandemic. *Sustainability,* (13), 1-27. https://doi.org/10.3390/su13169218

Sellbom, M. and Tellegen, A. (2019). Factor analysis in psychological assessment research: Common pitfalls and recommendations. *Psychological Assessment, 21*(12), 1428-1441. https://doi.org/10.1037/pas0000623

Van, N., Thi, T., Duc, T., Dinh, V., Thi, N., Van, D., Mingh, N., Van, T., Dang, N. and Ba, T. (2021). SME fnancing role in developing business environment and economic growth: empirical evidences from technical SMEs in Vietnam. *Environmental Science and Pollution Research*, *29*. https://doi.org/10.1007/s11356-022-19528-w

Vogt, W. (2015). Structural Equation. *Dictionary of Statistics & Methodology.*

Zhavoronok, A., Shchur, R., Zhezherun, Y., Sadchykova, I., Viadrova, N. and Tychkovska,

L. (2022). The role of the credit services market in ensuring stability of the banking system. *International Journal of Safety and Security Engineering, 12*(6), 667-679. https://doi.org/1org/10.18280/ijsse.120602

Infographics

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR | Retos Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 9-20

Campo Elías López-Rodríguez
Johanna Katherine Sotelo-Muñoz
Ingrid Janeth Muñoz-Venegas
Nicolás Fabián López-Aguas

Analysis of the multidimensionality of brand equity for the banking sector: a study on generation

Objective: Analyze the multidimensionality of Brand equity for the banking sector from the Generation Z perspective.

Result: The findings infer that Brand equity in banking perceived by Generation Z is made up of brand loyalty and importance, perceived quality, partnership, performance and brand awareness

Methodology: An analytical and cross-sectional quantitative study was developed, using exploratory and confirmatory factor analysis from an instrument applied online to 535 people belonging to generation z

Conclusion: The banking sector must continue to consolidate its brand equity from the dimensions found, strengthening the positioning of its brands, its participation and its orientation to the market, especially for generation Z.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

print ISSN: 1390-6291; electronic ISSN: 1390-8618

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR
Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 21-34

Eugenia Csoban-Mirka
Sofía Esqueda-Henríquez
Alfredo Ríos

Prediction of online purchase behavior: An application of the S-O-R Model

Objective: To evaluate the effect of the atmosphere of the online store in terms of computer and human characteristics, along with hedonic and utilitarian purchasing values on the attitude towards online shopping and emotional purchase, understood as mediating variables that ultimately affect the intention to repurchase in an online retail pharmacy, based on the Stimulus Organism Response (SOR) model.

Result: The greatest impact is recorded in the effect of hedonic purchase value (HSV) on emotional purchases (EVs), followed by attitude towards online purchases (AOS) on intention to repurchase (RI) and again hedonic purchase value (HSV) on AOS.

Methodology: 306 quality surveys were obtained after applying the questionnaire to users of an online pharmaceutical store in Venezuela and Colombia. Structural equations were used to evaluate, initially, the reliability and validity of the measure and, subsequently, the relationships between the variables

Conclusion: The study shows that the theoretical framework of the S-O-R model is appropriate for studying online shopping behavior. Elements of the web atmosphere, hedonic and utilitarian purchasing values, as well as computer factors along with individual factors, influence online purchasing behavior.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR
Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 35-50

Judith Cavazos-Arroyo
Aurora Máynez-Guaderrama
María Marisela Vargas-Salgado

Satisfaction with online clothing shopping: an analysis of its background

Objective: To evaluate whether the orientation to fast fashion and slow fashion, environmental awareness and product experiences, emotions and the website, affect the satisfaction with online shopping. In addition, to analyze the importance and performance of the experiences on satisfaction.

Result: Slow fashion orientation influences environmental awareness, as opposed to fast fashion orientation that has no effect on it. Environmental awareness has a positive impact on all three types of experience and these positively impact on satisfaction with buying clothes online.

Methodology: The research design is quantitative, explanatory and transversal. A non-probabilistic sample of 539 participants at the Mexican northern border is used. As statistical techniques, a PLS structural equation model and an importance-performance matrix were used

Conclusion: Clothing consumers who are more sensitive to environmental issues value more the consumer experience with the product; the emotional and the website are relevant aspects to satisfy online clothing buyers.

Scopus Q3
retos.ups.edu.ec
Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

print ISSN: 1390-6291; electronic ISSN: 1390-8618

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR | Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 51-66

Gerson Jaquin Cristancho Triana
Yezid Alfonso Cancino Gómez
Fabian Arley Ninco Hernández

Factors influencing sustainable consumption behavior in generation Z

Objetive: To analyze the relationship between sustainable consumption behavior with attitude, practices and perceived attributes in products and manufacturers around responsible consumption in generation Z of the city of Bogotá.

Result: Responsible consumption habits, attitude towards responsible consumption and product attributes have an impact on sustainable consumption behavior in generation Z.

Methodology: A descriptive study with a quantitative approach was carried out. A digital survey was applied to 903 adults born since 1995 in the city of Bogotá. A causal model was made from an analysis of structural equations using the Bootstrapping methodology, in order to validate the proposed hypotheses.

Conclusion: Manufacturers should improve their efforts to communicate and offer environmentally friendly products to the market.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR | Retos Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp.67-80

Isabel Cristina Flores-Rueda
Armando Sánchez-Macías
Mónica Eugenia Peñalosa-Otero
Sofía Cheverría-Rivera

¿Are you what you pay? Analysis of price knowledge and consumer profiles

Objective: To analyze the variations in the preferences of different types of consumers with respect to the pricing strategies implemented by a supermarket and its impact on the customer experience.

Result: The most important result reveals the presence of different segments in consumers, each with specific characteristics and behaviors, providing valuable information for marketing decision-making.

Methodology: A market segmentation methodology is employed to identify five thriving consumer segments: myopic switcher light, strategic switcher light, myopic switcher heavy, strategic loyal heavy and myopic loyal light.

Conclusion: It highlights the importance of adopting price strategies based on market segmentation in different regions, offering practical guidelines to improve efficiency in the implementation of retail price strategies in Mexico.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

print ISSN: 1390-6291; electronic ISSN: 1390-8618

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR | Retos Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 81-95

Basheer M. Al-Ghazali

Navigating the Digital Landscape: Factors Shaping Entrepreneurial Dynamics in Saudi Arabia

Objective: Thoroughly analyze the Saudi digital business landscape, exploring its impact on business goals, behaviors, innovation and self-efficacy, aligning with the country's vision for economic diversification and technological advancement.

Result: The study reveals a significant positive relationship between the digital entrepreneurial ecosystem and entrepreneurial behavior, emphasizing the influential role of the ecosystem in shaping strategies and actions of digital entrepreneurs.

Methodology: Using a mixed-method strategy, the study conducts interviews with experts to obtain qualitative information and subsequently collects quantitative data through a structured questionnaire applied to 248 participants in Saudi Arabia who participate in digital entrepreneurship.

Conclusion: The findings mention the importance of educational programs for digital entrepreneurs, suggesting that business education is essential to improve understanding and promote strategic decision-making in the digital business environment.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR
Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

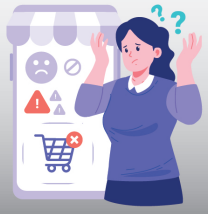
pp. 97-109

Vasilica Maria Margalina
Álvaro Jiménez-Sánchez
Alberto Magno Cutipa-Limache

PLS-SEM for online shopping intention in the fashion sector in Ecuadorr

Objective: To study the effect of confidence, convenience, perceived costs and perceived risks on the purchase intention, as well as to analyze the mediating role of trust among the other variables.

Result: Risks, confidence, and convenience directly influence purchase intention, but not costs.



Methodology: Model of structural equations PLS-SEM. Questionnaire provided to a sample of 223 Ecuadorian university students.

Conclusion: Businesses should reduce risks in online shopping and increase convenience with various strategies.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

print ISSN: 1390-6291; electronic ISSN: 1390-8618

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR | Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

Pedro Ramos De Santis

pp. 111-125

Customer satisfaction in logistics. An analysis of chatbots in the leading companies in Colombia, Peru and Ecuador

Objective: To analyze the impact of chatbots on logistics customer service in Colombia, Peru and Ecuador, identifying key factors that influence customer satisfaction and providing valuable perspectives for the practical application of these tools.

Result: The findings highlight the potential of chatbots to significantly improve customer service in logistics, highlighting their effectiveness in problem solving, familiarity with products, autonomy in problem solving, grammatical correction and user recommendations.

Methodology: The study was based on a multiple regression analysis with 1250 B2C chatbots users in logistics companies in the CPE area, focusing on the effectiveness of these tools and their impact on customer compliance.

Conclusion: Although chatbots can positively impact consumer satisfaction, the need to recognize geographical limitations and explore additional areas such as customer loyalty, response quality, and the optimal balance between chatbot and human support for a more comprehensive and generalizable understanding is emphasized.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR
Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 127-142

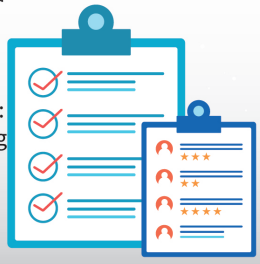
María Elizabeth Arteaga-García
Cecilia Alexandra Portalanza-Chavarría

Validation of an assessment instrument for Latin American projects

Objective: To adapt and validate the instrument called project implementation profile (PIP) for the assessment of projects carried out in Latin America..

Result: Compared to the original PIP (62 items), a reduction of 34 items and 10 to four critical success factors was evidenced: communication with the client, monitoring and planning, senior management and technical capabilities.

Conclusion: In the academic field, this adapted instrument facilitates the collection of data on the critical factors and criteria of success of the projects, particularly in the Ecuadorian context.



Methodology: For content validation, a translation and re-translation procedure was used. Exploratory factor analysis was performed in SPSS 229.0 for construct validation, and confirmatory factor analysis was applied in Smart PLS4 to evaluate convergent and discriminant validity.

Conclusion: This study contributes with an adapted instrument with complete validation, mainly for the Ecuadorian context consisting of 28 items: 23 measure the critical success factors and five the performance of the project.

Scopus Q3
retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

print ISSN: 1390-6291; electronic ISSN: 1390-8618

UNIVERSIDAD POLITÉCNICA SALESIANA ECUADOR | Retos
Revista de Ciencias de Administración y Economía

Vol. 14 No. 27
april-september 2024

pp. 143-159

Armando José Urdaneta-Montiel
Ángel Alberto Zambrano-Morales

Banking regulatory framework in Ecuador and its impact on SME financing

Objective: The main objectiive of this research is to clarify the connection between the regulatory framework of the Ecuadorian financial sector and the conditions that affect the financing for SMEs.

Result: The intention is to evaluate through analysis of the latent variable "Monetary Regulatory Framework" whether or not there is a linear relationship or dependence with other factors that show correlation and covariation between them, emphasizing the limitations of bank credit to Ecuadorian SMEs, due to the lack of guarantees and the high financing costs according to the literature consulted.

Methodology: The proposed methodology involves the application of structural equation models in order to establish solid theoretical relationships among the variables evaluated.

Conclusion: Detailed exploration of key variables, such as access to credit requirements, regulatory framework, organic codes, and financing conditions, reveals a significant relationship between them. This analysis highlights the critical importance of understanding these relationships to improve access to credit and promote sustainable economic growth.

Scopus Q3

retos.ups.edu.ec

Free publication
Translation from English-Spanish-Spanish to English
Desing: kcarbo@ups.edu.ec

Basic writing rules

Universidad Politécnica Salesiana del Ecuador

General information

"Retos" is a bilingual scientific publication by the Universidad Politécnica Salesiana de Ecuador, which has been edited on a bi-annual basis since January 2011. The journal focuses on Development and transdisciplinary issues including Public Administration, Social Economics, Marketing, Tourism, Entrepreneurship, Management, Administrative and Economic Science, etc.

It is an arbitrated Scientific Journal that uses an external evaluation system known as *peer-review*, employing *double-blind review*, in accordance with the American Psychological Association (APA) style rules. By using this system, the authors have access to an objective, impartial and transparent review process, which facilitates their publication being included in databases, repositories, and international indexed references.

"Retos" is indexed in the selective directory and catalog of the Online Regional Information System for Scientific Journals in Latin America, the Caribbean, Spain, and Portugal (Latindex), in the REDALYC Scientific Information System, the Directory of Open Access Journals in repositories, libraries, and specialized catalogs in Ibero-America.

The Journal is published with two different editions: printed (ISSN: 1390-62911) and electronic (e-ISSN: 1390-8618), in Spanish and English, and each article is identified with a DOI (Digital Object Identifier System).

Scope and policies

Themes

Original contributions in Development issues, as well as related fields: Public Administration, Social Economics, Marketing, Tourism, Entrepreneurship, Management...and all other disciplines related to the central thematic issue.

Contributions

"Retos" preferably publishes the results of empirical research about Development, written in Spanish and/or English, while reports, studies, and proposals are also accepted, as well as reviews of state-of-the-art literature.

All of the publications must be original, never have been published in any other journal, and not be undergoing any arbitration or publication processes. Contributions to the journal can include any of the following:

- **Research:** 5,000 to 6,500 words of text, including the title, abstracts, keywords, tables, and references.
- **Reports, Studies, and Proposals:** 5,000 to 6,500 words of text, including the title, abstracts, tables, and references.
- **Reviews:** 6,000 to 7,000 words of text, including tables and references. Justified, current, and selective references shall be evaluated, and should include around 70 publications.

print ISSN: 1390-6291; electronic ISSN: 1390-8618

"Retos" is published bi-annually (20 articles per year), in April and October, and each edition has two sections with five articles each, the first containing a **Monograph** theme edited by subject matter experts, and a second **Miscellaneous** section, made up of diverse contributions related to the publication's theme.

Presentation, structure, and submission of manuscripts

Papers are to be presented with Arial 10 typeface, single line spacing, all justified, without indentation or blank spaces between paragraphs. A space is only to be included between the major sections (title, authors, abstracts, keywords, credits, and epigraphs). All margins on each page must be 2 cm.

The papers are to be presented in Microsoft Word format (.doc or .docx), and the file is to be anonymous in the File Properties such that the author(s) is(are) not identified.

Manuscripts are to be submitted only through the OJS (Open Journal System), in which all authors must first register. Original papers sent via email or another interface are not accepted.

Manuscript Structure

For papers that are empirical research, the manuscripts are to follow IMRDC structure, while Notes and Contributions epigraphs are optional. Papers that constitute reports, studies, proposals, and reviews are afforded greater flexibility in terms of epigraphs, especially in relation to Materials and Methods, Analysis and Results, and Discussion and Conclusions. All types of papers are required to include References.

1. **Title (Spanish) / Title (English):** Concise but informative, the first line in Spanish and the second, in English. Maximum 80 characters are accepted, including spaces. The Editorial Board is allowed to propose changes to the author's title.
2. **First and last names:** of each of the authors, organized in order of priority. Maximum three authors are accepted per original paper, although justified exceptions may be allowed, based on the theme, complexity, and length. The names are to be followed by the professional category, workplace, each author's email address and ORCID number. It is mandatory to include whether the author has a doctorate degree (Dr. before the name).
3. **Abstract (Resumen, Spanish) / Abstract (English):** This section can contain a maximum of 230 words, first in Spanish and then in English. The abstract shall concisely contain the following, and in this order: 1) Justification of the theme; 2) Objectives; 3) Methods and sample; 4) Main results; 5) Main conclusions. It should be written impersonally "This paper analyzes..." In the abstract, automatic translation is not accepted due to its poor quality.
4. **Keywords (descriptores, Spanish) / Keywords (English):** Six keywords are to be included for each language, and must be directly related to the paper's theme. This requirement shall be scored based on whether the keywords can be found in the UNESCO Thesaurus.
5. **Introduction and State of the Question:** The section proposes the question, the context of the issue surrounding it, justification, basis, and proposal for the study, using bibliographic references, including the most important up-to-date literature on the theme, both nationally and internationally.
6. **Material and Methods:** This is to be composed in such a way that the reader can easily understand how the research was performed. As appropriate, describe the method, sample, sampling, and refer to the type of statistical analysis used. If it is an original method, present the reasons for applying it, and describe any possible limitations.

7. **Analysis and Results:** This section should seek to highlight the most important observations, and without including any value judgments, describe the methods used. Throughout the text, essential tables and figures shall be included in a logical sequence, without repeating any data.
8. **Discussion and Conclusions:** This section summarizes the most important findings related to any observations from relevant studies, pointing out contributions and limitations, without repeating data from other sections. The discussion and conclusions paragraph is to include inferences and new lines of research for the future.
9. **Contributions and acknowledgment (optional):** The Science Editors Board recommends that the author(s) specify the financing source for their research. Priority shall be given to work endorsed by competitive national or international projects. Regardless, for the manuscript to be scientifically evaluated, it is to be anonymized with an XXXX only for the initial evaluation, in order to avoid identification of any of the authors or research teams, which are to be named in the Cover Letter and later, in the final manuscript.
10. **Notes** (optional) are included, only if necessary, at the end of the article (before the references). They are to be included manually, since the Word footnotes are not recognized by the layout systems. Note numbers are to be included using superscript, both in the text and in the final note. Notes including simple bibliographic references (without comments) are not allowed, since these are supposed to be included in the references.
11. **References:** Bibliographic references are to follow the text references. Under no circumstances should references be included that have not been cited in the text. There should be enough references in order to contextualize the theoretical framework, and be based on criteria of contemporary relevance and importance. They are presented alphabetically, according to the author's last name (if the last name has more than one word, based on the first word of the last name).

Rules for references

Periodical publications

Journal article (one author) Valdés-Pérez, D. (2016). Incidencia de las técnicas de gestión en la mejora de decisiones administrativas [Impact of Management Techniques on the Improvement of Administrative Decisions]. *Retos, 12*(6), 199-2013. https://doi.org/10.17163/ret.n12.2016.05

Journal article (up to six authors): Ospina, M.C., Alvarado, S.V., Fefferman, M., & Llanos, D. (2016). Introducción del dossier temático "Infancias y juventudes: violencias, conflictos, memorias y procesos de construcción de paz" [Introduction of the thematic dossier "Infancy and Youth: Violence, Conflicts, Memories and Peace Construction Processes"]. *Universitas, 25*(14), 91-95. https://doi.org/10.17163/uni.n25.%25x

Journal article (more than six authors): Smith, S.W., Smith, S.L. Pieper, K.M., Yoo, J.H., Ferrys, A.L., Downs, E.,... Bowden, B. (2006). Altruism on American Television: Examining the Amount of, and Context Surronding. Acts of Helping and Sharing. *Journal of Communication, 56*(4), 707-727. https://doi.org/10.1111/j.1460-2466.2006.00316.x

Journal article (with no DOI). Rodríguez, A. (2007). Desde la promoción de salud mental hacia la promoción de salud: La concepción de lo comunitario en la implementación de proyectos sociales. *Alteridad, 2*(1), 28-40. (https://goo.gl/zDb3Me) (2017-01-29).

print ISSN: 1390-6291; electronic ISSN: 1390-8618

Books and chapters of books

Complete books: Cuéllar, J.C., & Moncada-Paredes, M.C. (2014). *El peso de la deuda externa ecuatoriana*. Quito: Abya-Yala.

Chapters of a book: Zambrano-Quiñones, D. (2015). *El ecoturismo comunitario en Manglaralto y Colonche.* En V.H. Torres (Ed.), Alternativas de Vida: Trece experiencias de desarrollo endógeno en Ecuador (pp. 175-198). Quito: Abya-Yala.

Electronic media

Pérez-Rodríguez, M.A., Ramírez, A., & García-Ruíz, R. (2015). La competencia mediática en educación infantil. Análisis del nivel de desarrollo en España. Universitas Psychologica, 14(2), 619-630. https://doi.org.10.11144/Javeriana.upsy14-2.cmei

All reference that have a DOI (Digital Object Identifier System) must be included in the References (which can be obtained at http://goo.gl/gfruh1). All of the journals and books that do not have a DOI are to appear with a link (to the online version, if available, shortened using Google Shortener: http://goo.gl) and the date of query in said format.

Journal articles are to be listed in English, except for those that are available in Spanish and English, in which case, both languages are to be included in brackets. All internet addresses presented are to be shortened in the manuscript, except for the DOI, which are to be included in the established format (https://doi.org/XXX).

Epigraphs, Tables, and Graphs

The epigraphs in the article's body are in Arabic numbers. These are to avoid all capital letters, underlining, or bold text. Numbering should use maximum three levels: 1. / 1.1. / 1.1.1. A carriage return is to be used at the end of each epigraph.

Tables are to be included in the text in Word format, according to their order of appearance, with Arabic numbering and captioned with a description of their content.

Graphics or figures should be kept to a minimum and incorporated into the text, in accordance with their order of appearance, with Arabic numbers and captions with a short description. Quality should be no less than 300 ppp, if necessary, using TIFF, PNG, or JPEG formats.

Submission process

The papers are to be submitted in two files through the journal's OJS system:

1. **Cover letter and title page,** which includes the title in Spanish and English, first and last names of the authors (standardized format) with ORCID number, abstract in Spanish and English, keywords in Spanish and English, and a declaration that the manuscript constitutes an original contribution that has not been sent for evaluation in another journal, confirmation of the authorship, acceptance (as the case may be) of formal changes to the manuscript according to the rules, and partial transfer of copyright to the publishing house (use the official format).
2. **Completely** anonymized manuscript in accordance with the preceding rules.

All authors are to register on the OJS platform, even if only one of them will be in charge of correspondence. No author can submit two manuscripts simultaneously, with a penalty of not being able to participate in four consecutive editions (2 years)...