



A multidimensional analysis of customer loyalty across customer lifetime value segments in credit card services

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Abstract

This study examines the factors influencing customer loyalty in credit card services and analyzes whether the structural relationships among loyalty determinants differ across customer segments defined by Customer Lifetime Value (CLV). A k-means clustering algorithm was applied to segment a population of 544,046 cardholders from a Colombian financial institution, followed by a survey of 664 customers. The proposed model was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that perceived value, satisfaction, reputation, trust, and commitment significantly influence loyalty. Although statistically significant differences are observed in construct levels across CLV-based segments, the structural relationships remain invariant. This suggests that the mechanisms underlying loyalty formation are consistent across customers with different economic value. By integrating CLV-based segmentation with relationship marketing constructs, this study contributes to bridging economic and relational perspectives in financial services, demonstrating that customer heterogeneity in value does not imply structural differences in loyalty formation.

Keywords Loyalty · Customer Lifetime Value · Satisfaction · Commitment · Trust

Introduction

The Colombian financial system, akin to other Latin American systems, is undergoing a transformation characterized by the digitization of payments, the expansion of fintech, and the implementation of open finance frameworks. This dynamism has intensified competition and encouraged the adoption of management models that prioritize customer relationships as a strategic asset. Between 2018 and 2021, the region's fintech ecosystem experienced a significant growth of 112% to a total of 2,482 platforms (Finnovista, Inter-American Development Bank, IDB Invest, 2022). More recently, the sector's growth has been even more pronounced: between 2017 and 2023, the number of companies

in the region quadrupled to more than 3,000, with Colombia accounting for approximately 13% of this total, largely due to regulatory developments and advances in financial inclusion (Reuters 2024). In this increasingly competitive context, understanding the drivers of customer loyalty has become a critical challenge for financial institutions. Recent research in banking contexts highlights the growing importance of behavioral intentions and continuance decisions in understanding customer relationships in financial services (Faradis and Afandi 2025).

In this context, the perceived value, satisfaction, reputation, trust, and commitment constructs are still regarded as the foundation for customer loyalty. These widely researched constructs have consistently demonstrated reliability as predictors of retention and relationship continuity (Sweeney and Soutar 2001; Selnes 1993; Nguyen and Leblanc 2001; Feldman et al. 2014; Ranaweera and Prabhu 2003; Wulf and Odekerken-Schröder 2003). Nevertheless, recent reviews in the banking sector highlight that, while satisfaction and trust remain key factors, loyalty in digital banking environments is also influenced by digital experience, perceived security, and personal customer innovation (Kim et al. 2024; Musyaffi et al. 2024; Buhler et al. 2024).

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Customer Lifetime Value (CLV), on the other hand, serves as a strategic metric for customer segmentation and the allocation of marketing resources. It allows companies to estimate the future profitability of customers to guide retention and cross-selling strategies (Collings et al., 2005; Kumar and Reinartz 2016; Ali and Shaban 2024). Its predictive capabilities have been heightened by recent advancements in data analytics and machine learning, which have augmented its utility in the financial services sector (Wong et al. 2025; Doğan et al. 2025).

Although numerous studies examine the foundations of loyalty, and others employ CLV as a segmentation tool, there is a scarcity of research that integrates both approaches to investigate how the explanatory factors of loyalty differ across segments explicitly defined by CLV, particularly in emerging markets such as Colombia (Firdose and Rao 2025). Specifically, prior research has not sufficiently examined whether the structural relationships underlying loyalty formation remain stable across customer segments with different economic value. This study aims to fill this gap by analyzing credit card customer loyalty at a Colombian financial institution. More specifically, it investigates whether the relationships among perceived value, satisfaction, reputation, trust, commitment, and loyalty differ across CLV-based segments. Loyalty is defined as a stable pattern of use and billing over time, explained by five constructs: perceived value, satisfaction, reputation, trust, and commitment. These constructs are contrasted in customer segments defined through CLV. Data from 664 cardholders, drawn from a portfolio of 544,046 customers, were utilized to estimate individual CLV and to apply a structural equation model (PLS-SEM).

The results indicate that, while significant differences exist in the levels of the constructs across segments, the structural relationships remain invariant. Despite the stability of the structural coefficients, as well as the consistency in adjustment, reliability, and validity indices, the results confirm the positive influence of the constructs on loyalty. Additionally, they disclose significant disparities in average ratings among CLV segments. From a theoretical perspective, these findings contribute to the integration of CLV with the antecedents of loyalty in an emerging market. They further suggest that customer heterogeneity in economic value does not imply differences in the mechanisms underlying loyalty formation. At the managerial level, they demonstrate that relationship marketing strategies must be tailored to customer lifetime value, thus maximizing the long-term return on the relationship.

This study reviews the literature on the above constructs and presents a segmentation strategy derived from the

Customer Lifetime Value. It then formulates the hypotheses, describes the methodology and results, and discusses the research's findings, conclusions, and limitations.

Literature review

Perceived Value

Perceived value is understood as the consumer's overall assessment of a product's utility, determined by their perceptions of what is received and what is given (Zeithaml 1988). It has been conceptualized as the quality-price ratio (Lin et al. 2005) or as the balance between benefits and sacrifices (Cronin et al. 2000). In the case of credit cards, the benefits include convenience, security, and immediate access to credit, while the trade-offs are financial costs or barriers to access (Zeithaml 1988; Pacheco 2016).

In retail banking, relationship marketing emphasizes value creation as a competitive advantage and sustainability factor (Ivanauskienė et al. 2012). It has been substantiated that while social dimensions often play a minor role in shaping value perception, emotional factors, such as trust, security, and attention, along with functional dimensions, such as service quality, exert the most significant impact (Cossío-Silva et al. 2016). Recent research in financial services highlights the role of emotional responses as key mechanisms linking customer experience to satisfaction and loyalty, reinforcing the relevance of emotional value dimensions in banking contexts (Espinosa Fernandez et al. 2026).

The PERVAL measurement instrument (Sweeney and Soutar 2001), which has been validated and replicated in various contexts, is employed in this study due to its ability to capture the multidimensional nature of perceived value (Walsh et al. 2014). Its applicability in banking has been confirmed by recent research. For instance, Mainardes (2023) demonstrates that perceived value impacts satisfaction and loyalty, Saif et al. (2024) highlight the significance of convenience and sustainability in digital banking, and Croitoru (2024) provides evidence of cross-cultural differences in the valuation of these dimensions. These findings prove that the construct remains valid and adaptable to the challenges posed by financial digitization.

From a theoretical perspective, perceived value is a key antecedent of satisfaction, as it captures the consumer's evaluation of the benefits received relative to the costs incurred. According to expectation-value and relationship marketing frameworks, higher perceived value leads to more favorable post-consumption evaluations, thereby increasing satisfaction levels (Cronin et al. 2000; Sweeney



and Soutar 2001). Empirical evidence in financial services consistently supports this relationship, showing that customers who perceive greater value are more likely to report higher satisfaction with the service. Therefore, the following hypothesis is proposed:

H₁: Perceived value positively influences satisfaction.

Perceived value is conceptualized as a multidimensional construct comprising emotional, social, economic, and quality dimensions. In this study, these dimensions are modeled as independent first-order constructs rather than as a higher-order construct. This specification allows for a more detailed assessment of the relative contribution of each value dimension to satisfaction, which is particularly relevant in financial services contexts where different value components may exert distinct effects.

Satisfaction

Customer satisfaction is one of the pillars of relationship marketing and consumer behavior. It has traditionally been described as a post-consumption evaluation, an emotional judgment that results from contrasting expectations with perceived performance (Selles 1993; Fornell et al. 1996). Although early research substantiated that high levels of satisfaction boost loyalty and profitability in organizations (Anderson et al. 1994; Oliver 1999), it is also acknowledged as a required but insufficient condition for ensuring sustained customer loyalty. Recent reviews suggest that this construct plays a pivotal role in influencing purchase behavior and ensuring customer loyalty, despite a global decline in satisfaction levels (Ramasamy et al. 2024).

In the financial services sector, rates, fees, perceived security, service quality, and ease of use of the channel are all factors that directly affect customer satisfaction, which in turn influences repurchase intent and the institution's reputation (Ganesh et al. 2000; Rasheed et al. 2015). Recent data support the strength of these relationships in digital contexts. Factors such as accessibility, security, reliability, and ease of use of digital banking have been identified in Nigeria as key determinants of satisfaction (Ndubueze 2023). In Lebanon, the banking industry has adapted to a crisis scenario by embracing dynamic technological changes to attain and maintain higher levels of customer satisfaction with digital banking channels (Harb et al. 2022). Furthermore, according to recent studies, the quality of digital services is a direct predictor of satisfaction and loyalty in the banking sector, and dimensions such as efficiency, privacy, and responsiveness have been identified as essential drivers of satisfaction in Islamic banking (Gazi, 2024; Hilmy and Saujan 2025).

Satisfaction and perceived value are strongly associated; whereas the latter occurs at various stages throughout the consumption process, satisfaction emerges as a post-assessment (Sweeney and Soutar 2001). Perceived quality and value delivered have been identified as key determinants of satisfaction (Cronin et al. 2000). A recent meta-analysis conducted in the banking sector confirms this relationship by concluding that satisfaction is the strongest predictor of loyalty, even surpassing perceived quality (Buhler et al. 2024).

From a theoretical perspective, satisfaction acts as a central mechanism linking perceived value to subsequent relational outcomes. Within relationship marketing theory, satisfaction reflects the customer's evaluation of the exchange and serves as a key driver of trust and long-term relational continuity. In addition, satisfaction has a direct effect on loyalty, as it shapes customers' intentions to continue the relationship, recommend the service, and expand their engagement with financial offerings. From a behavioral perspective, satisfied customers are more likely to exhibit repeat purchase behavior and attitudinal loyalty (Oliver 1999; Anderson et al. 1994). Therefore, the following hypothesis is proposed:

H₂: Satisfaction positively influences loyalty.

Finally, satisfaction has been shown to have a direct effect on loyalty. In addition to their propensity to maintain a relationship with the institution, satisfied customers actively endorse it and expand their engagement with its financial offerings (Anderson et al. 1994; Oliver 1999; Ganesh et al. 2000). Nevertheless, it is acknowledged that satisfaction alone does not guarantee loyalty, as even satisfied consumers may opt for competing alternatives. In this regard, recent research has revealed that satisfaction drives both repurchase intent and continued adoption of digital services (Nguyen 2025; Saleh et al. 2025), acting as a mediating variable between digital service quality and loyalty, particularly in Islamic and digital banking (Gazi, 2024; Hilmy and Saujan 2025). Recent evidence in the banking sector confirms the mediating role of customer satisfaction between service processes and loyalty, highlighting its central role in transforming service experiences into long-term relational outcomes (Agada et al. 2026); and between relationship management practices, reputation, and loyalty outcomes (Haghighinasab et al. 2025).

Accordingly, higher levels of satisfaction reduce uncertainty and strengthen perceptions of credibility, integrity, and reliability of the service provider (Sirdeshmukh et al. 2002; Agarwal et al. 2017). Therefore, the following hypothesis is proposed:

H₃: Satisfaction positively influences trust.



Moreover, satisfaction has been demonstrated to be a precursor to trust, reducing uncertainty and strengthening perceptions of credibility, integrity, and commitment within the organization (Sirdeshmukh et al. 2002; Agarwal et al. 2017). This link is especially relevant in digital environments, where satisfaction ensures service reliability and data protection, thereby promoting the development of trust in long-term relationships (Faradis and Afandi 2025). In this context, satisfied customers are more inclined to trust the brand, which intensifies the rapport and fosters retention (Ranaweera and Prabhu 2003). Thus, satisfaction is reaffirmed as the connection between perceived value, trust, and loyalty, which consolidates its strategic role in financial customer management.

Reputation

Corporate reputation is an intangible asset impacting both existing and potential customers. A favorable perception can bolster credibility and loyalty, while a negative one can quickly erode them (Nguyen and Leblanc 2001; Selnes 1993). In addition to being influenced by external factors and the organization's communication, reputation is established through positive and consistent interactions (Feldman et al. 2014). Understanding customer needs and maintaining strong relationships are critical to preserving a positive reputation in sectors such as banking, where the intangibility of services creates uncertainty (Bhat et al. 2018).

Classical literature has demonstrated that corporate reputation is a determinant of trust, as it consolidates perceptions of integrity, credibility, and organizational competence (Nguyen and Leblanc 2001; Helm, 2007). A solid reputation conveys consistency and accountability, which lowers risk perception and fosters enduring relationships (Ali et al. 2014). This role is further supported by recent evidence in the digital environment. In online and mobile banking, not only does a well-managed reputation promote trust, but it also fosters satisfaction and a willingness to recommend (Haghighinasab et al. 2025). Similarly, research indicates that in the financial services industry, reputation mediates the relationship between service quality and loyalty (Agada et al. 2026). Recent evidence in digital banking confirms that corporate reputation significantly influences customer loyalty, with satisfaction acting as a mediating mechanism that strengthens this relationship (Haghighinasab et al. 2025).

From a theoretical perspective, corporate reputation acts as a signal that reduces information asymmetry and uncertainty, thereby facilitating the development of trust in service providers (Spence, 1978). In line with signaling theory

and relationship marketing, customers rely on reputation as heuristics to evaluate the credibility and reliability of financial institutions (Nguyen and Leblanc 2001). Consequently, a stronger reputation enhances trust by reinforcing perceptions of integrity and competence. Therefore, the following hypothesis is proposed:

H₄: Reputation positively influences trust.

Overall, as an intangible resource that can guarantee long-term competitive advantages in the financial sector, especially in an increasingly digital environment, corporate reputation goes beyond merely shaping the organization's external image. Instead, it is a necessary condition for trust and loyalty, as confirmed by both classical and modern literature.

Trust

Trust is crucial in long-term relationships and transactions (Ranaweera and Prabhu 2003) for identifying transactional or relational strategies (Ganesan 1994). In the service sector, trust is the foundation for communication and continuity in the relationship and is grounded in the perception of the company's reliability and credibility (Agarwal et al. 2017; Raza et al. 2023). Several studies have underscored the relevance of this factor in forming an emotional bond between customers and the brand, positively influencing retention and loyalty (Bucheli and Brin 2016; Ho et al. 2025; Ranaweera and Prabhu 2003). In the banking sector, trust is a mediator between satisfaction and loyalty (Bhat et al. 2018; Ho et al. 2025; Thalhath et al. 2025) while also exerting a substantial impact on customer engagement (Tabrani et al. 2018).

Perceived value precedes trust, providing relational benefits and reducing uncertainty (Sirdeshmukh et al. 2002). Satisfaction contributes to trust (Bhat et al. 2018), and reputation positively influences trust (Ali et al. 2014). Corporate reputation reinforces trust and credibility (Feldman et al. 2014).

From a theoretical perspective, trust plays a central role in relationship marketing as a mechanism that reduces perceived risk and facilitates long-term exchange relationships (Morgan and Hunt 1994). In this context, trust emerges from prior evaluations of value, satisfaction, and reputation, and acts as a key driver of relational continuity. Customers who perceive higher value, experience greater satisfaction, and recognize a strong corporate reputation are more likely to develop trust in the service provider. Therefore, the following hypotheses are proposed:



H₅ Trust positively influences loyalty.

Commitment

Commitment, encompassing emotional and continuity dimensions, is crucial in relationship marketing (Morgan and Hunt 1994; Reydet and Carsana 2017). It represents a psychological state and a desire to maintain the relationship with the company (Wulf and Odekerken-Schröder 2003; Tabrani et al. 2018), influencing loyalty in both its affective and conative phases (Gustafsson et al., 2005; Oliver 1999; Buhler et al. 2024; Tegambwage and Kasoga 2024). The interplay of commitment and satisfaction determines retention (Gustafsson et al. 2005).

In the banking sector, customer loyalty is shaped by key relational constructs such as commitment, satisfaction, and trust (Afsar et al. 2010). Genuine loyalty is reflected not only in a favorable attitude toward the provider but also in a sustained intention to repurchase and continue the relationship over time (Hajiyani et al. 2017). In this sense, the consumer-company relationship is fundamentally grounded in trust and commitment, which together foster long-term relational stability and continuity (Hennig-Thurau and Klee 1997). From a theoretical perspective, commitment is a central construct in relationship marketing, emerging as a consequence of trust and acting as a key driver of long-term relational continuity (Morgan and Hunt 1994). Trust fosters commitment by reducing uncertainty and strengthening the willingness to maintain a valued relationship. In turn, committed customers are more likely to sustain their relationship with the provider and develop loyalty behaviors over time. Therefore, the following hypotheses are proposed:

H₆ Trust positively influences commitment.

H₇ Commitment positively influences loyalty.

Loyalty

Loyalty in the banking industry is determined by the duration of the customer's relationship with the bank, the number of products acquired, and the frequency of use (Kim et al. 2024; Ho et al. 2025). It encompasses intentional repurchase, emotional preference, recommendation, and commitment, along with cognitive, affective, conative, and behavioral phases (Oliver 1999). Behavioral loyalty refers to the frequency of repeat purchases, whereas attitudinal-affective loyalty is characterized by the psychological bond with the brand (Baptista and León 2013; Peter and Olson, 2005). Customer relationships are a valuable asset that should be leveraged to maximize profits (Pfeifer, 2005;

Chang 2007). Beliefs in brand attributes and affective preference are the foundations of loyalty (Oliver 1999).

From a theoretical perspective, loyalty represents the ultimate outcome of relationship marketing processes, reflecting both behavioral continuity and attitudinal commitment toward the service provider. Prior research consistently shows that loyalty is driven by relational constructs such as satisfaction, trust, and commitment, which together shape customers' intentions to maintain and strengthen their relationship with the firm.

Trust is crucial for fostering loyalty and establishing a lasting, successful relationship (Trif 2013; Tabrani et al. 2018; Buhler et al. 2024; Ho et al. 2025; Kim et al. 2024). In particular, trust enhances loyalty by reducing perceived risk and reinforcing confidence in the service provider, while commitment reflects the customer's willingness to maintain the relationship over time. Therefore, loyalty is conceptualized as the final outcome of the proposed model, influenced by satisfaction, trust, and commitment. In line with the proposed model, loyalty is therefore conceptualized as the final endogenous construct capturing the outcome of relational processes in financial services.

In light of the literature review, the hypothesized relationships are summarized in Fig. 1.

Customer Lifetime Value (CLV)

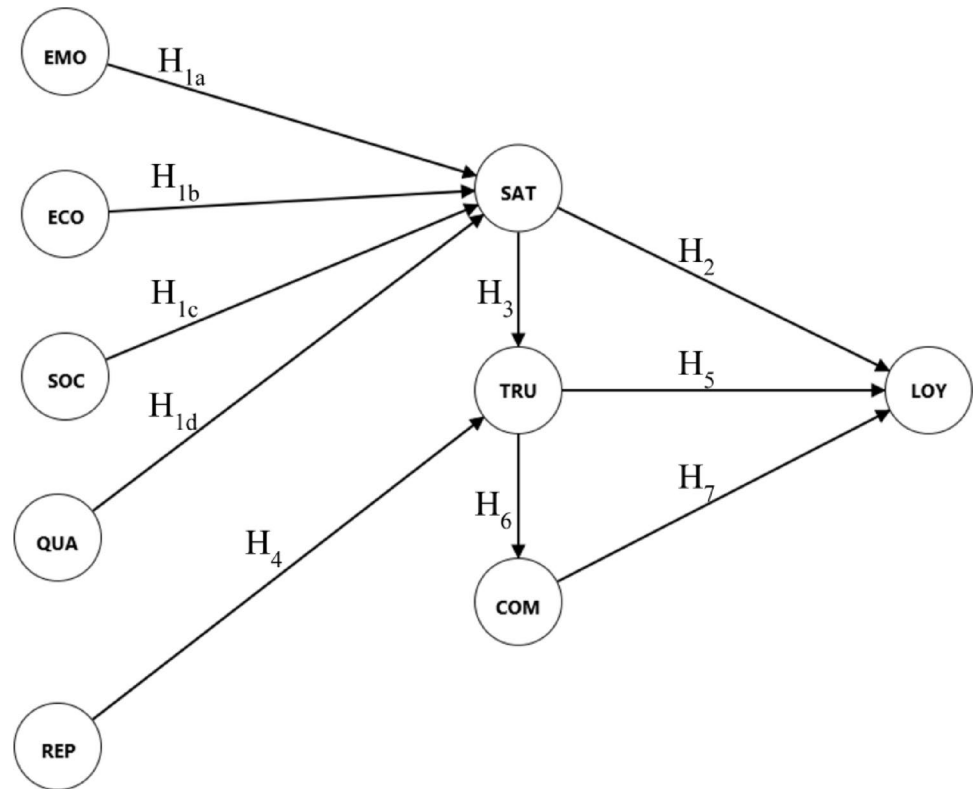
Customer Lifetime Value (CLV) is closely tied to customer satisfaction, marketing management, channel usage, cross-selling, frequency, and transaction value. A long-term relationship maximizes the net income generated from the customer, while concurrently decreasing expenditures in promotional activities (Blattberg et al. 2009).

CLV differs from Customer Profitability (CP) mainly due to its temporal focus. Whereas CLV projects a customer's predicted net value over the course of their engagement with the company, CP refers to the profitability generated by a customer in a specific period that has already elapsed. In other words, CLV is a forward-looking estimate that relies on predictions, while CP is a backward-looking measurement derived from actual accounting data (Pfeifer, 2005).

Customer Lifetime Value (CLV) is a key metric in Customer Relationship Management (CRM) that helps identify, categorize, and manage customers according to their anticipated economic value (Karahan and Kuzu 2014). This information facilitates decision-making aimed at retaining valuable customers and acquiring new, highly profitable ones (Chang 2007). The strategic application of CLV in CRM thereby boosts the organization's competitiveness, consumer satisfaction, and commercial efficiency.



Fig. 1 Proposed theoretical model



CLV-based differentiated customer management assists the banking sector in catering to customers according to their value and in handling revenue-generating transactions (Haenlein et al. 2007). By combining factors such as lifestyle and purchasing patterns, CLV-based segmentation allows businesses to pinpoint attributes that impact profitability and implement targeted strategies accordingly (Kahreh et al. 2014).

Although Customer Lifetime Value (CLV) is inherently a forward-looking metric, its estimation in applied contexts often relies on observed customer behavior as a proxy for expected future performance (Malthouse 2013). In this study, CLV is approximated using customers' net contributions over a 12-month observation window, under the assumption that recent transactional patterns are indicative of short-term future cash flows in relatively stable market conditions (Pfeifer, 2005). This approach allows for the estimation of customer value without requiring explicit forecasting of parameters such as growth rates or attrition probabilities, which are not always observable at the individual level. Therefore, although the metric is derived from historical data, it is interpreted as an approximation of expected customer value rather than a purely retrospective measure of customer profitability.

Following Malthouse (2013), CLV is conceptually defined as the discounted sum of expected future contributions:

$$CLV = \sum_{t=0}^T \frac{V_t}{(1+d)^{t-1}}$$

Where V_t represents the expected net contribution of the customer to the company in the period t ; d is the discount rate (approximated using inflation); and T is the time horizon for the estimation. In this study, expected contributions are proxied using observed contributions from the 12-month period. Growth and attrition parameters are not explicitly modeled, as the estimation focuses on providing a consistent and comparable measure of customer value for segmentation purposes across a large population.

Methodology

Information gathering

A segmentation technique is proposed for a population of 544,046 credit card customers holding “Type-A” products at the financial institution under examination. In this context, “Type-A” refers to a category of standard retail credit cards



defined internally by the bank, characterized by revolving credit features and broad customer eligibility (Kim et al. 2006).

The initial dataset consists of each customer's net contributions over the 12-month period prior to the analysis cut-off date, transactional information (purchases, advances, number of transactions, deferrals, billing months, balances, and credit limits), and sociodemographic data (city, gender, age, marital status, educational level, and economic activity). This dataset was organized into 44 data fields, comprising both continuous and categorical variables, for all customers over a 12-month estimation horizon. To minimize bias, only customers with at least six months of history were considered (Malthouse 2013).

Participation in the research was entirely voluntary, and participants gave their consent before completing the questionnaire. Furthermore, the confidentiality and anonymity of the information were assured, and data protection was maintained in accordance with national regulations.

Measurement scales

Drawing from previous research, a 5-point Likert scale specifically designed for retail banking was used to assess the variables of the constructs in this study (See Appendix A). The variable of trust was derived from research examining its relationship with loyalty and purchasing behavior (Ganesan 1994; Gefen et al. 2003; Morgan and Hunt 1994; Sirdeshmukh et al. 2002). Commitment was analyzed in terms of retention and the customer's effort to maintain the relationship (Gustafsson et al. 2005; Wulf and Odekerken-Schröder 2003). Perceived value was assessed from emotional, social, economic, and functional perspectives, following Sweeney and Soutar (2001), Fandos Roig et al. (2006), and Koller et al. (2011); and operationalized as independent first-order constructs. The reputation variable was formulated within

a banking-focused business setting, drawing on research by Nguyen and Leblanc (2001) and Feldman et al. (2014). Satisfaction attributes were established by analyzing their relationship with perceived value (Chen and Wang 2016; Lin et al. 2005) and their contribution to loyalty in the banking context (Ganesh et al. 2000; Hajiyan et al. 2017). All constructs in the model were specified as reflective measurement models, as the observed indicators are considered manifestations of the underlying latent variables. This specification is consistent with prior research in relationship marketing and perceived value literature, where these constructs are typically modeled as reflective.

Analysis and findings

The portfolio of 544,046 cardholders was segmented using the k-means algorithm, which is particularly suitable for large-scale datasets and for partitioning observations based on continuous variables such as transactional indicators and customer value measures. Its computational efficiency and interpretability make it appropriate for exploratory segmentation in financial services contexts.

The statistical robustness of the clustering solution was initially supported by an F-test that confirmed a significant reduction in within-group variability as the number of groups increased (Peña 2002). To determine the optimal number of clusters, silhouette score analysis was employed, obtaining its maximum value of 0.65 when the solution was configured into three segments. This value indicates a good balance between internal cohesion and separation across clusters.

Alternative solutions with a higher number of clusters (e.g., four or more) were also evaluated but resulted in lower silhouette scores and reduced interpretability of the segments. Therefore, the three-cluster solution was selected as the most appropriate for this study. Under this configuration,

Table 1 Descriptive analysis of transactional variables

Variable	Segment 1	Segment 2	Segment 3	Total
Customers	195,232	171,917	176,897	544,046
%Customers	35.9%	31.6%	32.5%	100.0%
Frequency	1.1	5.9	29.4	11.8
Retention	0.5	3.4	8.0	3.9
Recency	71.4	63.4	30.1	55.4
Deferred	2.6	7.4	10.6	6.7
Average Annual Revenue	532,207	1,895,893	8,800,796	3,651,667
Average Annual Purchases	397,399	1,590,451	5,230,606	2,345,921
Average Annual Advances	134,809	305,443	3,570,190	1,305,746
Average Annual Balance	319,660	912,933	3,307,558	1,478,650
Average CLV	4,098	90,799	244,184	109,559



the resulting segments represent 35.9%, 31.6%, and 32.5% of the total number of customers, respectively.

The descriptive analysis of transactional variables and CLV (Table 1) reveals pronounced differences across segments. Segment 3, which includes 32.5% of customers, generates 72.5% of total CLV and shows much higher levels of usage frequency, retention, and monetary flows. Segment 1, by contrast, represents 35.9% of the base but contributes only 1.3% of total value. This pattern describes a portfolio

in which a relatively small group of customers sustains most of the long-term economic value.

Beyond differences in average values, the segments exhibit distinct transactional profiles (see Appendix B). Segment 3 is characterized by high usage intensity, as reflected in substantially higher transaction frequency, retention levels, and financial activity (e.g., purchases, advances, and balances), which translate into a disproportionate contribution to total CLV. In contrast, Segment 1 comprises customers with very low transactional activity, limited engagement with credit card services, and minimal contribution to long-term value, as evidenced by low frequency, retention, and revenue levels, combined with higher recency values. Segment 2 represents an intermediate group, combining moderate usage patterns with stable but less intensive engagement, positioning it between the low- and high-value segments in terms of both behavior and economic contribution. These patterns indicate that the segments differ not only in their economic value but also in their level of behavioral engagement, reinforcing the relevance of CLV-based segmentation for understanding customer heterogeneity in financial services.

Sociodemographic variables do not display meaningful differences across segments; they are therefore described for the full population (Table 2). Most customers report low or medium monthly income, are older than 31 years, and are predominantly married, which is consistent with the typical profile of retail-banking users in the market under study.

To examine the attitudinal constructs, a proportional stratified simple random sampling design without replacement was employed, using the three CLV-based segments as strata. The final sample comprised 664 respondents, yielding an overall sampling error of 3.8% at a 95% confidence level.

Mean scores for the constructs differ significantly across segments ($p < 0.05$), according to mean-comparison tests based on the central limit theorem (Walpole et al. 2012). Segment 3 records the highest levels of emotional, economic, quality and social value, as well as satisfaction, reputation, trust, commitment, and loyalty. For instance, average loyalty increases from 2.53 in Segment 1 to 3.37 in Segment 3, and satisfaction rises from 3.01 to 3.91 in the same segments. Segment 2 systematically occupies an intermediate position. Post-hoc comparisons indicate that Segment 3 differs significantly from Segment 1 on all constructs and from Segment 2 on most of them.

Content validity was ensured by adapting measurement scales from established literature and by aligning each item with its corresponding construct definition. In line with the PLS-SEM approach, the measurement model was evaluated

Table 2 Descriptive analysis of sociodemographic variables

Variable	Frequency
<i>Expenses</i>	
Less than 500k	74.27%
500k – 1 m	14.70%
1–3 m	9.02%
3–5 m	1.20%
More than 5 m	0.81%
<i>Income</i>	
Less than 500k	13.66%
500k – 1 m	21.11%
1–1.5 m	15.17%
1.5–2 m	12.57%
2–3 m	14.13%
3–5 m	12.52%
More than 5 m	10.84%
<i>Gender</i>	
Female	51.35%
Male	48.65%
<i>Age</i>	
18–24	0.37%
25–30	5.19%
31–40	19.95%
41–50	23.73%
More than 50	50.77%
<i>Marital status</i>	
Single	29.92%
Married	62.15%
Common-law marriage	7.93%
<i>Level of education</i>	
No information	8.42%
High school graduate	27.18%
Associate's degree	23.86%
Bachelor's degree	27.53%
Postgraduate degree	13.01%
<i>Occupation</i>	
Employee	52.04%
Self-employed	27.47%
Student	0.51%
Household	5.42%
Retired	14.56%
<i>City type</i>	
Primary	47.21%
Secondary	23.84%
Tertiary	28.94%
Population	544,046



Table 3 Convergent validity and reliability

Construct	Item	Loading	T	P	Average factor loading	Cronbach's alpha	AVE
			values	values			
Commitment (COM)	COM3	0.97	18.3	0	0.97	0.93	0.9
	COM4	0.97	16.72	0			
Trust (TRU)	TRU1	0.97	29.39	0	0.97	0.94	1
	TRU2	0.97	17.63	0			
Loyalty (LOY)	LOY1	0.87	15.01	0	0.89	0.94	0.8
	LOY2	0.91	21.16	0			
	LOY3	0.83	41.5	0			
	LOY4	0.93	17.88	0			
	LOY5	0.92	19.57	0			
Reputation (REP)	REP1	0.93	33.21	0	0.93	0.94	0.8
	REP2	0.93	15.5	0			
	REP3	0.94	33.57	0			
	REP6	0.93	42.27	0			
Satisfaction (SAT)	SAT3	0.94	22.38	0	0.93	0.92	0.9
	SAT4	0.92	20.44	0			
	SAT5	0.94	18.8	0			
Quality value (QUA)	QUA1	0.83	29.64	0	0.88	0.9	0.8
	QUA2	0.91	25.27	0			
	QUA3	0.91	60.66	0			
	QUA4	0.87	34.8	0			
Economic value (ECO)	ECO1	0.92	57.5	0	0.91	0.93	0.8
	ECO3	0.93	16.9	0			
	ECO4	0.93	15.5	0			
	ECO5	0.87	51.17	0			
Emotional value (EMO)	EMO2	0.94	25.4	0	0.94	0.85	0.9
	EMO4	0.93	26.57	0			
Social value (SOC)	SOC1	0.97	32.33	0	0.97	0.93	0.9
	SOC4	0.97	53.88	0			

Table 4 Discriminant validity

COM	COM	TRU	LOY	REP	SAT	QUA	ECO	EMO	SOC
	0.93	0.94	0.89	0.93	0.92	0.82	0.79	0.86	0.78
TRU	0.90	0.95	0.87	0.95	0.90	0.84	0.77	0.84	0.77
LOY	0.82	0.81	0.80	0.88	0.88	0.75	0.83	0.82	0.77
REP	0.90	0.87	0.83	0.87	0.90	0.83	0.79	0.83	0.78
SAT	0.90	0.90	0.83	0.83	0.87	0.85	0.80	0.89	0.76
QUA	0.87	0.88	0.81	0.89	0.80	0.78	0.73	0.81	0.68
ECO	0.81	0.81	0.89	0.84	0.84	0.79	0.83	0.77	0.70
EMO	0.83	0.82	0.81	0.80	0.86	0.89	0.85	0.87	0.72
SOC	0.79	0.80	0.81	0.82	0.79	0.73	0.74	0.80	0.94

through indicator loadings, internal consistency, and convergent and discriminant validity, which serve as the equivalent of confirmatory factor analysis in covariance-based SEM (Hair et al. 2019). This approach is consistent with variance-based SEM, where measurement validation is conducted through reliability and validity criteria rather than covariance-based confirmatory factor analysis. Following Hair et al. (2019), all constructs meet standard thresholds for reliability and convergent validity: Cronbach's alpha

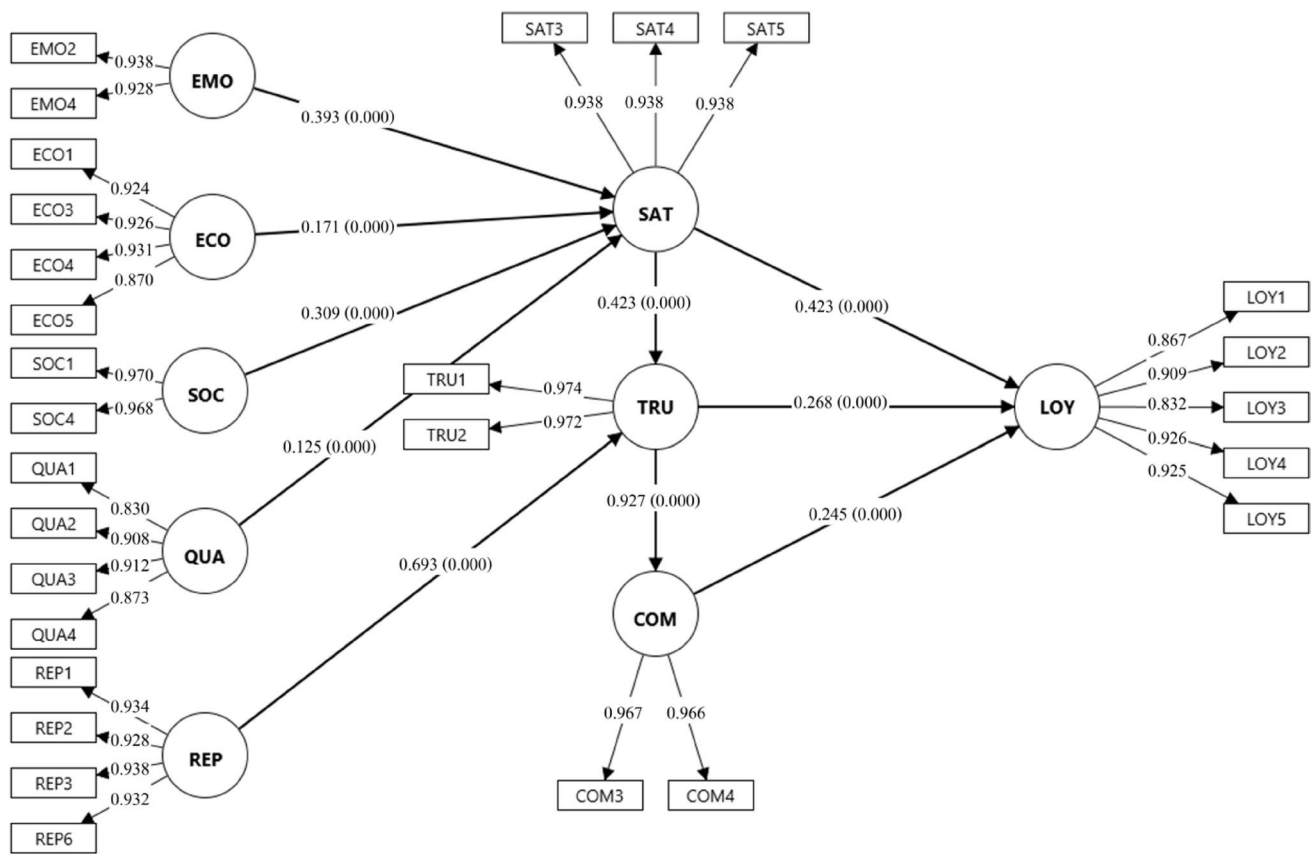
values remain below 0.95 and average variance extracted (AVE) exceeds 0.50. Factor loadings are above 0.50 for all retained items, with high average loadings at the construct level (see Table 3), which confirms the internal consistency of the scales.

Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT), which is considered a more robust criterion than cross-loadings in PLS-SEM (Hair et al. 2019). All HTMT values were below the recommended threshold,



Table 5 Hypothesis testing

Hypothesis		Path Coefficients						Conclusion
		General	T value	P value	Cluster 1	Cluster 2	Cluster 3	
H _{1a}	EMO $\diamond$ SAT	0.393	12.281	0.000	0.270	0.419	0.447	Not rejected
H _{1b}	ECO $\diamond$ SAT	0.171	3.800	0.000	0.176	0.208	0.115	Not rejected
H _{1c}	QUA $\diamond$ SAT	0.309	14.714	0.000	0.409	0.240	0.355	Not rejected
H _{1d}	SOC $\diamond$ SAT	0.125	2.604	0.000	0.147	0.131	0.070	Not rejected
H ₂	SAT $\diamond$ LOY	0.423	16.920	0.009	0.445	0.406	0.406	Not rejected
H ₃	SAT $\diamond$ TRU	0.260	8.667	0.000	0.166	0.275	0.275	Not rejected
H ₄	REP $\diamond$ TRU	0.693	46.218	0.000	0.776	0.680	0.661	Not rejected
H ₅	TRU $\diamond$ LOY	0.268	7.657	0.000	0.236	0.265	0.277	Not rejected
H ₆	TRU $\diamond$ COM	0.927	77.250	0.000	0.910	0.924	0.936	Not rejected
H ₇	COM $\diamond$ LOY	0.245	5.976	0.000	0.272	0.260	0.258	Not rejected

**Fig. 2** Structural model

confirming discriminant validity (see Table 4). The results are consistent with a clear empirical separation among perceived value, satisfaction, reputation, trust, commitment and loyalty, even in the presence of relatively strong associations expected in relational settings. In addition, variance inflation factors ($VIF < 5$) rule out relevant multicollinearity problems; indicators with higher VIF values were removed from the model and the retained items exhibit VIF values between 2.22 and 4.99.

The SRMR is used to assess model fit by comparing the observed correlation matrix to that of the model. A good fit is defined as $SRMR < 0.08$, and in this study, an SRMR of 0.06 was obtained. The NFI is also examined, despite its lack of robustness for complex models. An acceptable fit is described as an NFI value greater than 0.9; in this instance, an NFI of 0.87 was attained. Although slightly below the conventional threshold, this value is considered acceptable given the complexity of the model and the use of PLS-SEM.



The measures indicate adequate fit quality and robustness for testing the hypotheses. The findings for the 664 observations are reported, and no relevant differences were observed during the validations of each segment. With this level of robustness, the hypotheses are validated through Path Analysis, which assesses the fit of the theoretical models and the independent variables' direct and indirect contributions to the dependent variables. The statistical significance of the relationships was evaluated using a bootstrapping procedure with 10,000 subsamples. Table 5 displays the positive influence of all the proposed relationships, while Fig. 2 illustrates the relationships in the empirical structural model.

The structural model was also estimated separately for each CLV-based segment (Table 5). Although CLV and transactional behavior differ markedly across clusters, formal tests of differences in path coefficients (multi-group comparison) indicate no statistically significant differences in path coefficients in the structural relationships among perceived value, satisfaction, reputation, trust, commitment and loyalty. Thus, the loyalty formation mechanism is invariant across CLV segments.

Discussion

Theoretical contribution

On the theoretical side, combining CLV-based segmentation with the loyalty model adds a link between economic and relational perspectives. The CLV analysis reveals marked heterogeneity in profitability and transactional behavior: a relatively small high-CLV segment concentrates most of the long-term value, while a large low-CLV group contributes only a small share (Blattberg et al. 2009; Pfeifer, 2005; Malthouse 2013; Karahan and Kuzu 2014). Despite this heterogeneity, the PLS-SEM estimates remain stable across CLV-based clusters, indicating that the configuration of paths among perceived value, satisfaction, reputation, trust, commitment and loyalty does not change significantly with profitability. In other words, customer heterogeneity in economic value does not translate into differences in the structural mechanisms that explain loyalty formation. This suggests that the fundamental mechanisms underlying loyalty formation are structurally stable across customers with different levels of economic value. This is consistent with recent findings showing that trust remains a central and stable construct across different financial contexts, despite variations in demographic and behavioral factors (Sholevar and Bachmann 2025).

Importantly, differences across segments are reflected in the levels of relational constructs rather than in the structure of their relationships. That is, high- and low-CLV customers

differ in how strongly they perceive value, satisfaction, and trust, but not in how these constructs interact to generate loyalty. This finding contributes to bridging CLV-based segmentation and relationship marketing theory, showing that economic and relational perspectives can be integrated without assuming structural differences in behavioral mechanisms. This is consistent with recent findings in financial services marketing, where customer satisfaction has been identified as a key mediating mechanism linking service processes (Agada et al. 2026), customer experience (Thalhath et al. 2025; Espinosa Fernandez et al. 2026), and reputation to loyalty (Haghighinasab et al. 2025). Thus, loyalty formation follows a stable structural pattern across economically heterogeneous segments, reinforcing the robustness of relational constructs in explaining customer behavior in financial services contexts.

Managerial implications

For managers in retail banking, the joint use of CLV and structural modelling offers guidance on where and how to intervene. Specifically, it allows firms to align resource allocation with both customer profitability and the drivers of relational outcomes. CLV segmentation helps prioritize resources towards customers who generate the greatest stream of future cash flows (Pfeifer, 2005; Malthouse 2013; Haenlein et al. 2007). The structural model clarifies which levers are most closely related to loyalty: enhancing emotional and quality value, protecting economic value perceptions, and reinforcing satisfaction, reputation and trust.

Importantly, the invariance of the structural model across CLV segments suggests that firms can rely on a common relational logic when designing strategies to foster customer loyalty. However, this does not imply that differentiation strategies should be limited to increasing the intensity of rewards. Instead, firms should tailor the scale, personalization, and delivery of value propositions according to customer lifetime value. High-CLV customers may justify more proactive relationship management, personalized communication and enriched service experiences, whereas medium- and low-CLV segments may benefit from clearer communication of economic advantages, simpler product offerings and more cost-efficient digital channels (Ali et al. 2014).

Although sociodemographic characteristics showed no meaningful differences across segments, transactional variables displayed substantial variation, reinforcing their direct link with profitability. This pattern highlights the importance of monitoring product usage intensity, such as purchases and cash advances, as key drivers of economic value and loyalty. Thus, differentiation strategies should reflect



not only differences in the magnitude of benefits, but also in how value is delivered and communicated across segments. By combining CLV-based prioritization with a consistent relational framework, firms can allocate resources more effectively while maintaining coherence in their customer relationship strategies.

Limitations and future research

Several characteristics of the study impose limits and open paths for further work. The analysis focuses on a single Colombian financial institution and one specific product, so the stability of the loyalty mechanism across CLV segments should be re-examined in other banks, product portfolios and regulatory environments. The design is cross-sectional and uses self-reported scales for attitudinal constructs which may limit causal inference; longitudinal data and behavioral indicators of loyalty (e.g., product holding, digital channel usage) would allow a closer look at the dynamics of CLV and relationship quality over time. In addition, the model does not explicitly incorporate constructs related to digital experience, perceived cybersecurity or innovation in service delivery, which recent studies identify as relevant in increasingly digital banking ecosystems (e.g., Croitoru, 2024; Gazi, 2024; Kim et al. 2024; Musyaffi et al. 2024; Hilmy and Saujan 2025; Saif et al. 2024; Saleh et al. 2025). Extending the framework to include such variables would help explain how digital touchpoints reshape value perceptions, satisfaction, and loyalty. The CLV estimation is based on observed contributions over a 12-month period and does not explicitly incorporate growth or attrition dynamics. Future research could extend this approach by applying probabilistic CLV models that account for variations in retention, growth, and discount rates across customer segments, thereby enabling more precise estimates of customer lifetime value and its relationship with loyalty mechanisms. Future studies could also examine how curated service experiences and co-created loyalty attributes enhance satisfaction and relational outcomes across different CLV segments.

Conclusions

Overall, the evidence indicates that CLV-based heterogeneity in economic value coexists with a relatively stable loyalty mechanism grounded in perceived value, satisfaction, reputation, trust, and commitment. Credit card customers in an emerging-market setting differ widely in their contribution to long-term profitability yet respond to a common relational structure. In particular, the findings show that while differences across segments are reflected in the levels of relational constructs, the structural relationships among them remain invariant.

Using CLV to guide the allocation of marketing resources and the structural model to identify the main relational levers offers banks a way to align financial objectives with the management of customer relationships in a more systematic and sustainable manner. Despite limited sociodemographic differentiation across clusters, marked disparities in transactional behavior underscore the financial relevance of CLV-based segmentation. From a theoretical perspective, this study contributes to integrating economic and relational approaches by demonstrating that customer heterogeneity in value does not imply differences in the mechanisms underlying loyalty formation.

However, this study is subject to several limitations. The analysis is based on a single financial institution and a specific product category, which may limit the generalizability of the findings. In addition, the cross-sectional design and the use of self-reported measures may restrict causal inference. Future research could extend this approach by incorporating probabilistic CLV models that explicitly account for retention, growth, and discount dynamics. Further studies could also explore the role of digital experience, innovation, and security perceptions in shaping loyalty mechanisms across different customer segments and financial contexts.



Appendix

Appendix A. Measurement scales

Construct	Definition	Code	Item	Source
Emotional value	The affective utility derived from the consumption experience, reflecting the extent to which the service generates positive emotions such as enjoyment, pleasure, or reassurance.	EMO1	I feel comfortable making purchases with my credit card.	Sweeney and Soutar (2001)
		EMO2	I feel secure making purchases and/or payments with my credit card.	
		EMO3	I feel good when I make purchases and/or payments with my credit card.	
		EMO4	I often feel like using my credit card.	
Economic value	The perceived trade-off between monetary benefits and costs, reflecting the extent to which the service is considered financially advantageous.	ECO1	The costs associated with my credit card are reasonable in relation to the value it offers me.	Koller et al. (2011)
		ECO2	The costs associated with my credit card are competitive compared to other credit cards on the market.	
		ECO3	The benefits my credit card offers me generate value compared to the associated costs.	
		ECO4	The benefits my credit card offers me are competitive compared to other credit cards on the market.	
		ECO5	The handling fee I pay for my credit card is justified.	
Quality value	The perceived performance and reliability of the service, capturing functional benefits such as service quality, efficiency, and dependability.	QUA1	My credit card works whenever I need it.	Fandos Roig et al. (2006)
		QUA2	My credit card consistently delivers the benefits it promises.	
		QUA3	My credit card is reliable.	
		QUA4	The offers provided by my credit card give me good value for money.	
Social value	The utility derived from the service's ability to enhance social self-concept, including status, image, and social approval associated with its use.	SOC1	My credit card helps me feel accepted.	Sweeney and Soutar (2001)
		SOC2	My credit card improves how people perceive me.	
		SOC3	My credit card helps me present a positive image to others.	
		SOC4	My credit card gives me prestige.	



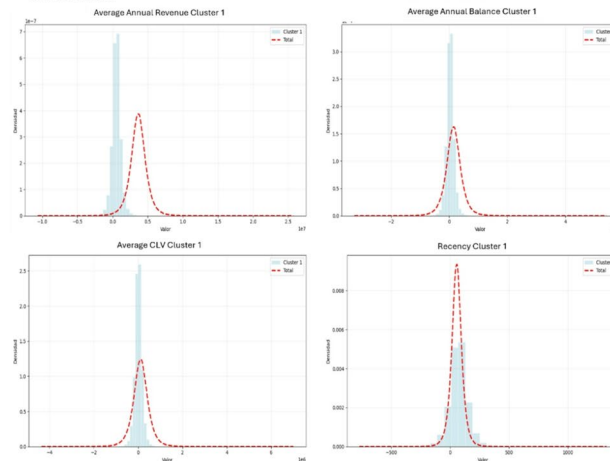
Construct	Definition	Code	Item	Source
Satisfaction	The overall evaluative judgment of the service experience, resulting from the comparison between expectations and perceived performance.	SAT1	I am satisfied with the services I receive through my credit card.	Chen and Wang (2016)
		SAT2	The choice to maintain my current credit card is the right one.	Lin et al. (2005)
		SAT3	I am doing the right thing by using my credit card to make purchases.	
		SAT4	I make purchases and/or advances with my credit card in a manner that is convenient for me.	Ganesh et al. (2000)
		SAT5	Overall, I am satisfied with my credit card issuer.	Hajiyan et al. (2017)
Trust	The belief in the reliability, integrity, and credibility of the service provider, reflecting confidence in its ability to fulfill promises and act in the customer's interest.	TRU1	My credit card issuer gives me a feeling of trust.	Ganesan (1994)
		TRU2	My credit card issuer is highly reliable.	Morgan and Hunt (1994)
		TRU3	My credit card issuer is responsive to its customers.	Sirdeshmukh et al. (2002)
		TRU4	My credit card issuer understands its market.	Gefen et al. (2003)
		TRU5	My credit card issuer maintains an open relationship with its customers.	Ganesan (1994)
Commitment	The customer's enduring intention to maintain a valued relationship with the service provider, reflecting both emotional attachment and willingness to continue the relationship.	COM1	I am pleased to be a customer of the financial institution that issued my credit card.	Gustafsson et al. (2005)
		COM2	My credit card issuer looks after my interests.	
		COM3	I trust my credit card issuer.	
		COM4	I am willing to continue being a customer of my credit card issuer.	Wulf and Odekerken-Schröder (2003)
Reputation	The overall perception of the organization's credibility, reliability, and standing in the market, formed through accumulated experiences and external signals.	REP1	My credit card issuer always keeps its promises.	Nguyen and Leb-lanc (2001)
		REP2	My credit card issuer is better than other companies in the financial sector.	
		REP3	My credit card issuer offers a range of good products and services.	Feldmand et al. (2014)
		REP4	My credit card issuer generates positive feelings among its customers.	
		REP5	My credit card issuer is ethical.	
		REP6	My credit card issuer has a good reputation.	Nguyen and Leb-lanc (2001)
		REP7	My credit card issuer is successful and confident.	



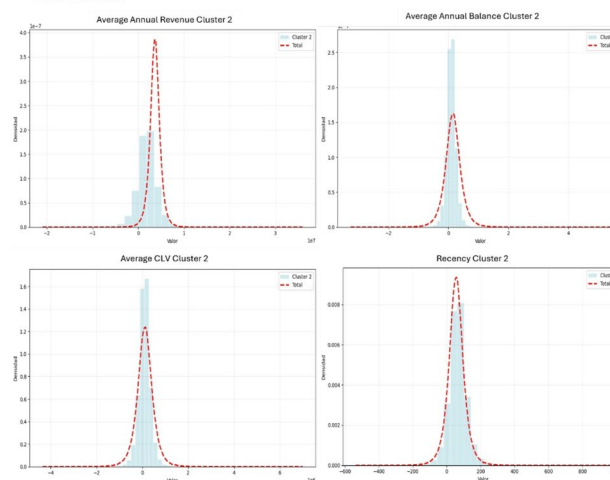
Construct	Definition	Code	Item	Source
Loyalty	The customer's intention and behavior to continue using the service, recommend it, and maintain a long-term relationship with the provider.	LOY1	I consider the financial institution that issued my credit card to be my first choice for financing.	Ganesh et al. (2000)
		LOY2	I plan to continue using my credit card in the years to come.	
		LOY3	I will continue to use my credit card, even if the current fee for its use rises.	
		LOY4	I will continue to use my credit card, despite an offer of similar benefits from a competing financial institution.	Hajiyani et al. (2017)
		LOY5	I recommend my credit card issuer to friends and family.	

Appendix B: Cluster characterization

CLUSTER 1



CLUSTER 2



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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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