

ORIGINAL

## Towards sustainable financial inclusion in Ecuador: analysis of key factors

### Hacia una inclusión financiera sostenible en Ecuador: análisis de factores claves

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#### ABSTRACT

**Introduction:** financial inclusion is a key component for economic development and reducing inequalities, especially in emerging economies such as Ecuador, where gaps in access to and effective use of formal financial services persist.

**Objective:** to analyze the determining factors of financial inclusion in Ecuador through a multidimensional approach that allows identifying causal relationships between different components of the financial system and their impact on effective access to financial services.

**Method:** quantitative study with cross-sectional design that employed a structural equation model (SEM) to evaluate five dimensions of financial inclusion. The sample included 151 participants from key sectors of the Ecuadorian financial system, selected through stratified sampling. A validated instrument with 19 indicators organized into five latent factors was used, with statistical analysis performed in AMOS 24.

**Results:** the analysis revealed a statistically significant relationship between financial product development and financial inclusion ( $\beta = 1,223$ ,  $p = 0,019$ ). The regulatory framework and supervision achieved the highest level of knowledge (74,05 %), while the commitment of public and private sectors presented the lowest performance (52,45 %). The SEM model demonstrated adequate fit (RMSEA = 0,054, CFI = 0,939).

**Conclusions:** innovation in financial products constitutes the determining factor for improving financial inclusion in Ecuador. The results evidence the need to strengthen public-private partnerships and improve inter-institutional coordination to translate regulatory knowledge into effective practical implementation.

**Keywords:** Financial Inclusion; Ecuador; Structural Equations; Financial Products; Public Policy.

#### RESUMEN

**Introducción:** la inclusión financiera es un componente clave para el desarrollo económico y la reducción de desigualdades, especialmente en economías emergentes como la ecuatoriana, donde persisten brechas en el acceso y uso efectivo de servicios financieros formales.

**Objetivo:** analizar los factores determinantes de la inclusión financiera en Ecuador mediante un enfoque multidimensional que permita identificar las relaciones causales entre diferentes componentes del sistema financiero y su impacto en el acceso efectivo a servicios financieros.

**Método:** estudio cuantitativo con diseño transversal que empleó un modelo de ecuaciones estructurales (SEM) para evaluar cinco dimensiones de inclusión financiera. La muestra incluyó 151 participantes de sectores clave del sistema financiero ecuatoriano, seleccionados mediante muestreo estratificado. Se utilizó un instrumento validado con 19 indicadores organizados en cinco factores latentes, con análisis estadístico realizado en AMOS 24.

**Resultados:** el análisis reveló una relación estadísticamente significativa entre el desarrollo de productos financieros y la inclusión financiera ( $\beta = 1,223$ ,  $p = 0,019$ ). El marco regulatorio y supervisión alcanzó el mayor nivel de conocimiento (74,05 %), mientras que el compromiso de sectores público y privado presentó el menor desempeño (52,45 %). El modelo SEM demostró ajuste adecuado (RMSEA = 0,054, CFI = 0,939).

**Conclusiones:** la innovación en productos financieros constituye el factor determinante para mejorar la inclusión financiera en Ecuador. Los resultados evidencian la necesidad de fortalecer alianzas público-privadas y mejorar la coordinación interinstitucional para traducir el conocimiento regulatorio en implementación práctica efectiva.

**Palabras clave:** Inclusión Financiera; Ecuador; Ecuaciones Estructurales; Productos Financieros; Política Pública.

## INTRODUCTION

Financial inclusion has become a fundamental element for sustainable economic development and poverty reduction at the global level.<sup>(1)</sup> This concept has evolved from simple access to banking services to a multidimensional perspective that encompasses the quality, use, and impact of these services on the well-being of the population. In the Latin American context, and in Ecuador in particular, financial inclusion represents a complex challenge that requires the effective articulation of multiple factors, including solid regulatory frameworks, innovation in financial products, inter-institutional coordination, and commitment from both the public and private sectors.<sup>(2)</sup> Globally, the financial inclusion gap remains considerable, especially in developing economies, where structural, technological, and socioeconomic barriers limit access to quality financial services.

International literature has shown that effective financial inclusion is not limited to access to financial services, but encompasses broader dimensions such as the quality, appropriate use, and impact of these services on the well-being of users.<sup>(3)</sup> This multidimensional perspective is relevant in emerging economies such as Ecuador, where structural, technological, and socioeconomic barriers can limit the effectiveness of financial inclusion policies.

The Ecuadorian financial system has undergone significant transformations in recent decades, particularly with the implementation of the Organic Monetary and Financial Code and the strengthening of the popular and solidarity economy sector.<sup>(4)</sup> However, significant challenges remain in terms of effective access, especially for rural populations, women, youth, and microentrepreneurs.<sup>(5)</sup>

A previous study has identified that financial inclusion in Ecuador has particular characteristics related to the country's geographical, cultural, and economic diversity.<sup>(6)</sup> The presence of a dual financial sector, which includes both traditional banking institutions and savings and credit cooperatives, creates unique opportunities but also specific challenges in terms of coordination and regulation.<sup>(7)</sup>

Research on financial inclusion in Ecuador has tended to focus on specific aspects such as access to credit, use of banking services, or the impact of government programs.<sup>(8)</sup> However, there is a gap in knowledge about the causal relationships between different factors that influence financial inclusion, as well as about the relative effectiveness of different public policy strategies.

In this context, this study seeks to contribute to existing knowledge through a comprehensive analysis that examines the relationships between five key dimensions of financial inclusion. The first dimension, regulatory framework and supervision, comprises the regulations and control mechanisms that ensure the stability of the financial system. The second, implementation of access programs, refers to concrete initiatives to facilitate access to financial services for underserved populations. The third dimension, comprehensive inclusion strategy, encompasses the development of innovative financial products tailored to specific needs. The fourth, regulatory framework and governance, includes institutional structures and coordination among actors in the system. Finally, the fifth dimension, financial inclusion and access to services, evaluates the effective results in terms of access, use, and quality of financial services. The methodological approach used, based on structural equation models, allows for the identification of not only correlations but also causal relationships between these factors.

The objective of this research is to analyze the determinants of financial inclusion in Ecuador using a multidimensional approach that allows for the identification of causal relationships between different components of the financial system and their impact on effective access to financial services.

## Literature review

### *Conceptual Framework of Financial Inclusion*

Financial inclusion has evolved conceptually from a perspective focused solely on access to a multidimensional approach that considers quality, use, and well-being.<sup>(9)</sup> This evolution reflects a growing recognition that mere access to financial services does not guarantee benefits for users, especially in contexts of socioeconomic vulnerability.

The most widely accepted definition, proposed by the World Bank, conceptualizes financial inclusion as the access to and use of useful and affordable services that meet the needs of individuals and businesses, delivered in a responsible and sustainable manner.<sup>(10)</sup> This definition emphasizes not only the availability of services, but also their relevance, affordability, and the responsible manner in which they are provided.

This conceptual framework has been expanded to integrate additional dimensions, such as financial education, consumer protection, and financial system stability. These elements provide a more comprehensive understanding of the conditions that favor inclusive, transparent, and secure access to financial services, as well as the risks associated with their absence. These elements are relevant in emerging economies where users may lack prior experience with formal financial services and where the stability of the system may be more vulnerable to external shocks.

### *Determinants of Financial Inclusion*

The literature has identified multiple factors that influence financial inclusion, which can be categorized into supply, demand, and institutional environment factors. Supply factors include the availability of appropriate financial products, distribution infrastructure, and transaction costs. Demand factors include income, financial education, trust in the financial system, and specific financial needs. Institutional environment factors include regulatory frameworks, macroeconomic stability, and the quality of institutions.

The effectiveness of financial inclusion policies depends on the coherent articulation between these factors. Adequate coordination between regulation, financial education, consumer protection, technological innovation, and service provision can reduce access gaps, improve confidence in the system, and ensure that financial instruments respond to the needs of traditionally excluded sectors.<sup>(13)</sup> For example, the availability of innovative financial products may have limited impact if it is not accompanied by appropriate financial education or if regulatory frameworks do not facilitate their adoption.

### *Innovation in Financial Products*

Innovation in financial products has emerged as a critical factor for financial inclusion, especially in the context of the digital revolution.<sup>(14)</sup> Financial technologies (fintech) have enabled the development of products and services that can overcome traditional barriers to access, such as geographical distance, lack of credit history, and high transaction costs.

Paredes Cruz *et al.*<sup>(1)</sup> emphasize that management styles in popular and solidarity finance have a significant impact on the sustainability of these initiatives, which supports the importance of developing specific financial products for different population segments. This perspective is relevant in the Ecuadorian context, where the popular and solidarity economy sector plays an important role in the provision of financial services.

### *Regulatory Framework and Supervision*

The regulatory and supervisory framework is a fundamental element of financial inclusion, as it must balance financial stability objectives with facilitating access.<sup>(15)</sup> Highly restrictive regulations can limit innovation and access, while inadequate regulatory frameworks can compromise stability and consumer protection.

The literature has identified key principles for regulatory frameworks that promote financial inclusion, including proportionality, a risk-based approach, and adaptive regulation that can evolve with technological innovations.<sup>(16)</sup> These principles are relevant in the context of digital financial services, where traditional regulatory frameworks may not be appropriate.

### *Interagency Coordination*

Effective coordination among different actors in the financial system has been identified as a critical factor for the success of financial inclusion policies.<sup>(17)</sup> This coordination should encompass not only government institutions, but also the private sector, civil society organizations, and international agencies.

Case studies of countries that have made significant progress in financial inclusion highlight the importance of clear institutional mechanisms for coordination, including interagency committees, national financial inclusion strategies, and monitoring and evaluation systems.<sup>(18)</sup>

### *Financial Education and Consumer Protection*

Financial education and consumer protection have gained recognition as essential elements of financial inclusion. Financial education not only facilitates the appropriate use of financial services, but also empowers

users to make informed decisions and protect themselves against abusive practices.

Casamen Gualotuña<sup>(3)</sup> emphasizes the importance of financial service quality for customer satisfaction, which is directly related to the need for robust consumer protection frameworks. Research has shown that trust in the financial system is an important determinant of the adoption and use of financial services.

### *Ecuadorian Context*

The Ecuadorian financial system has unique characteristics that influence the dynamics of financial inclusion. The dollarization of the economy has provided macroeconomic stability, but it has also limited some monetary policy tools.<sup>(20)</sup> The popular and solidarity economy sector, which includes savings and credit cooperatives, mutual societies, and other organizations, represents a significant proportion of the financial system and serves segments of the population that have always had limited access to traditional banking services.

Specific studies on Ecuador have identified particular challenges related to the country's geographic dispersion, cultural diversity, and economic heterogeneity. These factors require differentiated approaches that consider the specific needs of different regions and population groups.

## **METHOD**

### **Research Design**

This research used a quantitative, observational, cross-sectional design to analyze the determinants of financial inclusion in Ecuador. The study was based on the positivist paradigm, using advanced statistical methods to identify causal relationships between latent variables through structural equation modeling (SEM).<sup>(22)</sup>

The cross-sectional design was selected for its ability to provide a comprehensive snapshot of the current state of financial inclusion in Ecuador, allowing for the simultaneous evaluation of multiple dimensions and their interrelationships. Although this design has limitations in establishing temporal causality, the use of SEM allows for the inference of causal relationships based on solid theoretical frameworks.

### **Population and Sample**

The target population included key actors in the Ecuadorian financial system, including public officials, financial sector professionals, academics, and business sector representatives with knowledge and experience in financial inclusion issues. The sample was selected using non-probability convenience sampling, including individuals who agreed to participate voluntarily in the study. The inclusion criteria were: being of legal age, having professional or academic experience in the Ecuadorian financial system, and agreeing to participate in the study. Individuals who did not meet these criteria were excluded.

The sample size was calculated using the formula for finite populations with a 95 % confidence level and an 8 % margin of error:

$$n = (Z^2 \times p \times q) / E^2$$

Where:

- Z: Critical value for 95 % confidence (1,96)
- p: Expected proportion (0,5, for maximum variability)
- q: 1-p (0,5)
- E: Maximum allowable sampling error (0,08)

Applying the formula:  $n = (1,96^2 \times 0,5 \times 0,5) / 0,08^2 = 150,06 \approx 151$

The final sample of 151 participants was distributed across different sectors, ensuring representativeness and external validity of the results.<sup>(24)</sup>

### **Data Collection Instrument**

A structured questionnaire was applied, designed based on specialized literature and international financial inclusion frameworks, adapted to the Ecuadorian context through expert judgment. The instrument consisted of 19 items grouped into five latent dimensions:

#### *Dimension 1: Regulatory Framework and Supervision of the Financial System (F1)*

- Organic Monetary and Financial Code.
- General Law on Financial System Institutions.

#### *Dimension 2: Implementation of Financial Access Programs (F2)*

- Technology and Access to Financial Services.

- Specific Initiatives and Programs.

*Dimension 3: Comprehensive Financial Inclusion Strategy (F3)*

- Objectives and Scope of Financial Inclusion.
- Institutional Mandate and Regulatory Framework.
- Development of Financial Products.
- Commitment of the Public and Private Sectors.
- Interinstitutional Coordination Framework.

*Dimension 4: Regulatory and Governance Framework (F4)*

- Legal Mandate and Regulatory Framework.
- Protection and Stability of the Financial System.

*Dimension 5: Financial Inclusion and Access to Services (F5)*

- Financial Inclusion Objectives.
- Technology and Access to Financial Services.
- Financial Education and Consumer Protection.
- Legal and Regulatory Framework.
- Financial Education and User Protection.
- Financial User Protection.
- Financial Education.
- Access to Financial Products and Services.

Each indicator was measured using a 6-point Likert scale (1 = Very low, 6 = High), eliminating the neutral option to force participants to take a position.<sup>(25)</sup>

### **Validation of the Instrument**

The validation of the instrument was carried out in three stages:

Content validity: eight experts (academics in finance and professionals from the Ecuadorian financial system) evaluated the clarity, relevance, and consistency of the items. Suggested semantic and wording adjustments were incorporated.

Construct validity: exploratory factor analysis (EFA) was applied, supporting the five-factor structure, explaining 68,4 % of the total variance. Subsequently, confirmatory factor analysis (CFA) confirmed the adequacy of the measurement model.

Internal reliability: cronbach's alpha was calculated ( $\alpha = 0,952$ ), indicating excellent internal consistency.<sup>(26)</sup> The coefficients per dimension were: F1 ( $\alpha = 0,847$ ), F2 ( $\alpha = 0,823$ ), F3 ( $\alpha = 0,891$ ), F4 ( $\alpha = 0,798$ ), and F5 ( $\alpha = 0,924$ ), all within acceptable and high ranges.

### **Data Collection Procedure**

Data collection took place between March and May 2024, using a mixed strategy that combined face-to-face and digital surveys. Face-to-face surveys were conducted during academic and professional events related to financial inclusion, while digital surveys were distributed through professional networks and industry associations.

Multiple quality controls were implemented, including verification of response completeness, detection of inconsistent response patterns, and validation of participant eligibility. The response rate was 78,3 %, which is considered satisfactory for this type of study.<sup>(27)</sup>

### **Statistical Analysis**

The statistical analysis was performed in three stages using SPSS 28 and AMOS 24. The first stage included descriptive analysis to characterize the sample and evaluate the distribution of variables. The second stage comprised reliability analysis and validation of the measurement model. The third stage involved structural equation modeling ( ) to evaluate causal relationships between latent factors.

### **Structural Equation Modeling**

SEM was implemented following the two-stage approach proposed by Anderson et al.<sup>(28)</sup>. The first stage evaluated the measurement model to confirm that the observed indicators adequately represent the latent constructs. The second stage evaluated the structural model to examine the causal relationships between latent factors.

The criteria for evaluating model fit included:

**Absolute Fit Indices**

- Chi-square ( $\chi^2$ ): evaluates the discrepancy between observed and predicted matrices.
- RMSEA (Root Mean Square Error of Approximation): < 0,06 indicates good fit.
- GFI (Goodness of Fit Index): > 0,9 indicates acceptable fit.
- AGFI (Adjusted Goodness of Fit Index): > 0,9 indicates acceptable fit.

**Incremental Fit Indices**

- CFI (Comparative Fit Index): > 0,9 indicates a good fit.
- TLI (Tucker-Lewis Index): > 0,9 indicates good fit.
- NFI (Normed Fit Index): > 0,9 indicates acceptable fit.

**Parsimony Indices**

- CMIN/DF: < 3 indicates acceptable fit.
- AIC (Akaike Information Criterion): lower values indicate better fit.
- PNFI and PCFI: higher values indicate greater parsimony.

**Evaluation and Interpretation Criteria**

To interpret the results, a rating scale was established based on the class interval method, which allows data to be organized into specific ranges, facilitating their analysis and interpretation.<sup>(29)</sup> Table 1 presents the scale used for the qualitative assessment of the indicators.

Alternative	Rank (%)	Qualitative Assessment	Description
6	83,34 - 100,00	High	Excellent knowledge/implementation
5	66,68 - 83,33	Moderately high	Good knowledge/implementation
4	50,01 - 66,67	Moderate	Acceptable knowledge/implementation
3	33,34 - 50,00	Moderately low	Limited knowledge/implementation
2	16,68 - 33,33	Low	Poor knowledge/implementation
1	0,00 - 16,67	Very low	Very poor knowledge/implementation

The classification system uses six levels ranging from “Very Low” (0-16,67 %) to “High” (83,34-100 %), allowing for a standardized interpretation of the results obtained in each dimension and indicator evaluated.

**Ethical considerations**

The study respected the ethical principles established in the Declaration of Helsinki and the Ethical Standards of the American Psychological Association, guaranteeing the respect, confidentiality, and autonomy of the participants. All subjects were informed about the objectives, scope, and academic purposes of the study and gave their informed consent prior to participation.

No sensitive personal data was collected, nor were any interventions applied that compromised the physical or psychological integrity of the participants. The data obtained was treated anonymously and used exclusively for scientific purposes.

**RESULTS**

**Sample Characteristics**

Sector	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Public Officials	39	25,8	25,8	25,8
Small and Medium-Sized Entrepreneurs	31	20,5	20,5	46,3
University Professors	21	13,9	13,9	60,2
Social Science Professionals	18	11,9	11,9	72,1
Basic Education or High School Teachers	13	8,6	8,6	80,7
Legal Professionals	11	7,3	7,3	88,0
Banking Sector Employees	10	6,6	6,6	94,6
Cooperative Sector Employees	8	5,3	5,3	100,0
Total	151	100,0	100,0	100,0

The final sample of 151 participants showed a diverse distribution but was strategically concentrated in key sectors of the Ecuadorian financial system. Public officials accounted for 25,8 % (n=39), followed by small and medium-sized entrepreneurs with 20,5 % (n=31), university professors with 13,9 % (n=21), and social science professionals with 11,9 % (n=18). This distribution reflects the importance of these sectors in the implementation and supervision of financial inclusion policies.<sup>(32)</sup> Table 2 presents the detailed distribution of the sample by sector.

The table shows the frequency, percentage, and cumulative percentage of participants according to their professional sector, revealing a diverse representation that is strategically concentrated in key sectors of the Ecuadorian financial system.

The balanced representation of sectors such as teachers (8,6 % primary and secondary education) and legal professionals (7,3 %) provides valuable insights into educational and regulatory aspects of financial inclusion. The lower representation of employees in the cooperative (5,3 %) and banking (6,6 %) sectors could limit the analysis of these specific sectors, although their inclusion provides important operational perspectives.<sup>(33)</sup>

### Reliability and Distribution Analysis

The reliability analysis confirmed the excellent internal consistency of the instrument ( $\alpha = 0,952$ ), validating its use for measuring perceptions of financial inclusion in the Ecuadorian context.<sup>(34)</sup> The distribution analysis is presented in figure 1, which shows the behavior of the total scores.

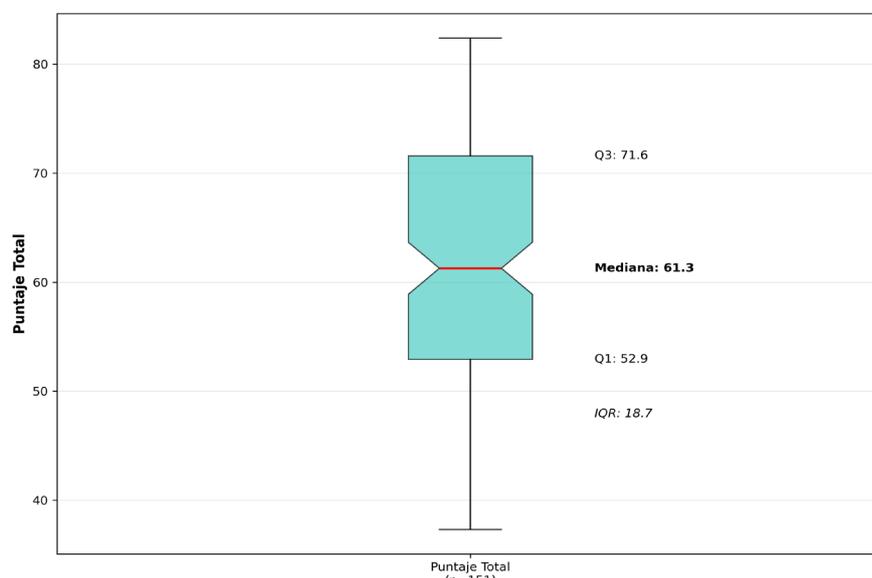


Figure 1. Box Plot - Distribution of Scores

The graph shows the distribution of the scores obtained by the 151 participants, revealing a slight negative asymmetry, with a higher concentration of values at the high levels of financial inclusion. The median is close to the third quartile (Q3), indicating that more than 50 % of the participants obtained high scores. The interquartile range (IQR) concentrates 50 % of the data between 40 and 80 points. The absence of outliers, determined using the criterion of 1,5 times the IQR, reflects adequate homogeneity of the sample and supports the stability of the estimates.<sup>(35)</sup>

This analysis was performed in the SPSS 28 program, using descriptive statistics (mean, median, standard deviation, minimum and maximum values, IQR, skewness, and kurtosis), as well as graphical inspection of the distribution. These elements made it possible to characterize the behavior of the scores, verify basic assumptions, and provide a solid basis for the subsequent interpretation of the results and estimation of the structural equation model.

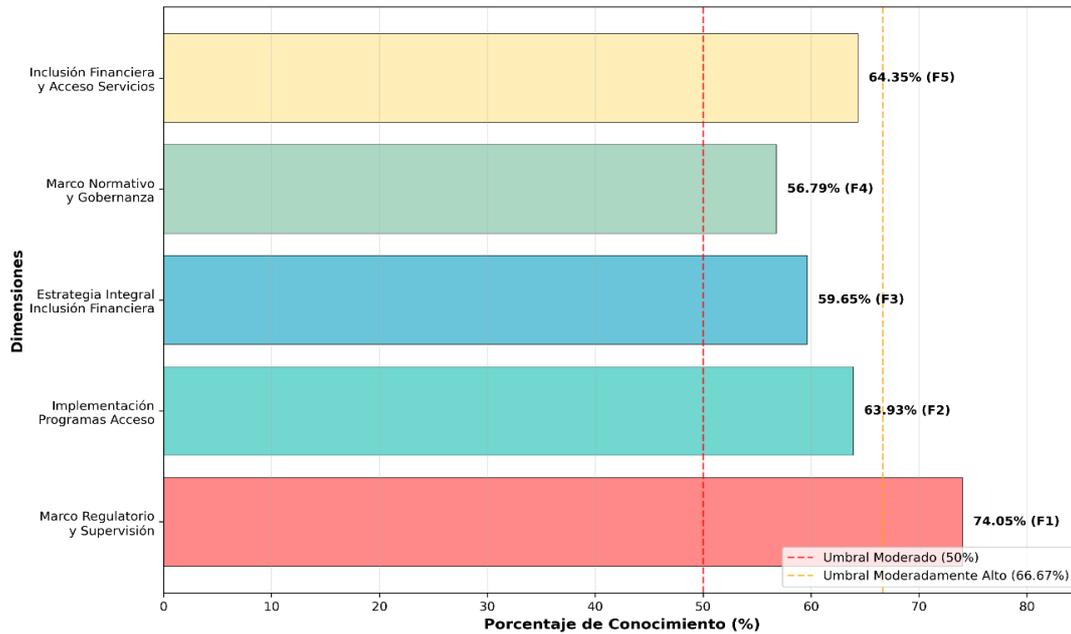
### Nonparametric Analysis

The Kruskal-Wallis nonparametric test was applied to evaluate differences in total scores between different sectors, given that the data did not meet the assumptions of normality (Shapiro-Wilk,  $p < 0,05$ ). The results did not show statistically significant differences between groups ( $H = 8,247$ ,  $p = 0,311$ ), so the hypothesis of equal distributions between sectors was maintained.

This finding indicates that perceptions of financial inclusion are relatively homogeneous among the different actors analyzed, suggesting a general consensus regarding the main challenges and opportunities identified in the Ecuadorian context.

**Evaluation by Dimensions and Indicators**

The dimensional analysis revealed significant variations in knowledge and perception of different aspects of financial inclusion. Figure 2 presents a comprehensive visualization of the results by dimension.



**Figure 2.** Evaluation by Dimensions

The figure 2 shows the percentages of knowledge for each of the five dimensions evaluated (F1-F5), including reference lines for moderate (50 %) and moderately high (66,67 %) thresholds. The results show significant variations between dimensions, with F1 reaching the highest level (74,05 %) and F4 the lowest (56,79 %). Table 3 presents a detailed analysis of all indicators organized by factors and dimensions.

Factor	Dimension	Indicator	Percentage	Rating
F1	Regulatory Framework and Supervision	Organic Monetary and Financial Code	71,61	Moderately High
F1	Regulatory Framework and Supervision	General Law on Financial System Institutions	76,49	Moderately High
F2	Implementation of Programs Access	Technology and Access to Financial Services	64,74	Moderate
F2	Implementation of Access Programs	Specific Initiatives and Programs	63,13	Moderate
F3	Comprehensive Inclusion Strategy	Financial Inclusion Objectives and Scope	70,64	Moderately High
F3	Comprehensive Inclusion Strategy	Institutional Mandate and Regulatory Framework	54,08	Moderate
F3	Comprehensive Inclusion Strategy	Financial Product Development	60,60	Moderate
F3	Comprehensive Inclusion Strategy	Public and Private Sector Commitment	52,45	Moderate
F3	Comprehensive Inclusion Strategy	Interinstitutional Coordination Framework	60,49	Moderate
F4	Regulatory Framework and Governance	Legal Mandate and Regulatory Framework	52,98	Moderate
F4	Regulatory Framework and Governance	Financial System Protection and Stability	60,60	Moderate
F5	Financial Inclusion and Access	Financial Inclusion Goals	71,71	Moderately High
F5	Financial Inclusion and Access	Technology and Access to Financial Services	58,44	Moderate

F5	Financial Access	Inclusion	and	Financial Education and Consumer Protection	75,76	Moderately High
F5	Financial Access	Inclusion	and	Legal and Regulatory Framework	63,58	Moderate
F5	Financial Access	Inclusion	and	Financial Education and User Protection	65,81	Moderate
F5	Financial Access	Inclusion	and	Financial User Protection	56,29	Moderate
F5	Financial Access	Inclusion	and	Financial Education	60,93	Moderate
F5	Financial Access	Inclusion	and	Access to Financial Products and Services	62,25	Moderate

The table presents a comprehensive assessment of the 19 indicators organized according to the five latent factors (F1-F5), including awareness percentages and qualitative assessment according to the established scale. The highlighted values indicate indicators with above-average (green) or below-average (red) performance.

- Regulatory Framework and Supervision of the Financial System (F1): 74,05 %
- Organic Monetary and Financial Code: 71,61 %
- General Law on Financial System Institutions: 76,49 %

This dimension achieved the highest level, classified as “Moderately High.” The results suggest a solid knowledge of the regulatory framework among participants, which can be attributed to the importance of these regulations in the Ecuadorian financial system and their widespread dissemination among professionals in the sector.

- Implementation of Financial Access Programs (F2): 63,93 %
- Technology and Access to Financial Services: 64,74 %
- Specific Initiatives and Programs: 63,13 %

Technology emerges as a slightly more recognized factor than specific initiatives.

- Comprehensive Financial Inclusion Strategy (F3): 59,65 %
- Financial Inclusion Objectives and Scope: 70,64 %
- Institutional Mandate and Regulatory Framework: 54,08 %
- Development of Financial Products: 60,60 %
- Public and Private Sector Commitment: 52,45 %
- Inter-institutional Coordination Framework: 60,49 %

This dimension shows the greatest internal variability, with defined objectives but significant weaknesses in sectoral commitment and institutional mandates. Public-private commitment has the lowest score in the entire study.

- Regulatory and Governance Framework (F4): 56,79 %
- Legal Mandate and Regulatory Framework: 52,98 %
- Protection and Stability of the Financial System: 60,60 %

This dimension has the lowest performance, suggesting that, although there is knowledge of the regulatory framework (F1), its translation into effective governance has significant limitations.

- Financial Inclusion and Access to Services (F5): 64,35 %
- Financial Inclusion Objectives: 71,71 %
- Technology and Access to Financial Services: 58,44 %
- Financial Education and Consumer Protection: 75,76 %
- Legal and Regulatory Framework: 63,58 %
- Financial Education and User Protection: 65,81 %
- Financial User Protection: 56,29 %
- Financial Education: 60,93 %
- Access to Products and Services: 62,25 %

The results show that, although the overall objectives are clear and financial education is valued, implementation faces significant barriers. Figure 3 presents a radar analysis that allows us to visualize the multidimensional profile of financial inclusion in Ecuador.

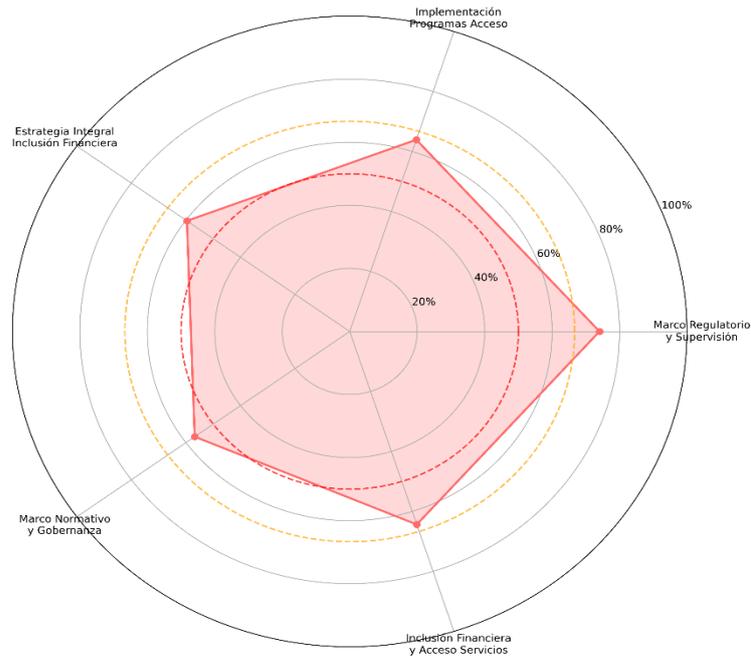


Figure 3. Multidimensional Profile of Financial Inclusion

The radar chart shows the relative performance of the five dimensions evaluated, highlighting strengths in the regulatory framework (F1) and areas for improvement in the normative framework and governance (F4). The reference lines indicate the moderate (50 %) and moderately high (66,67 %) thresholds. Additionally, figure 4 presents a detailed analysis of all indicators organized by factors.

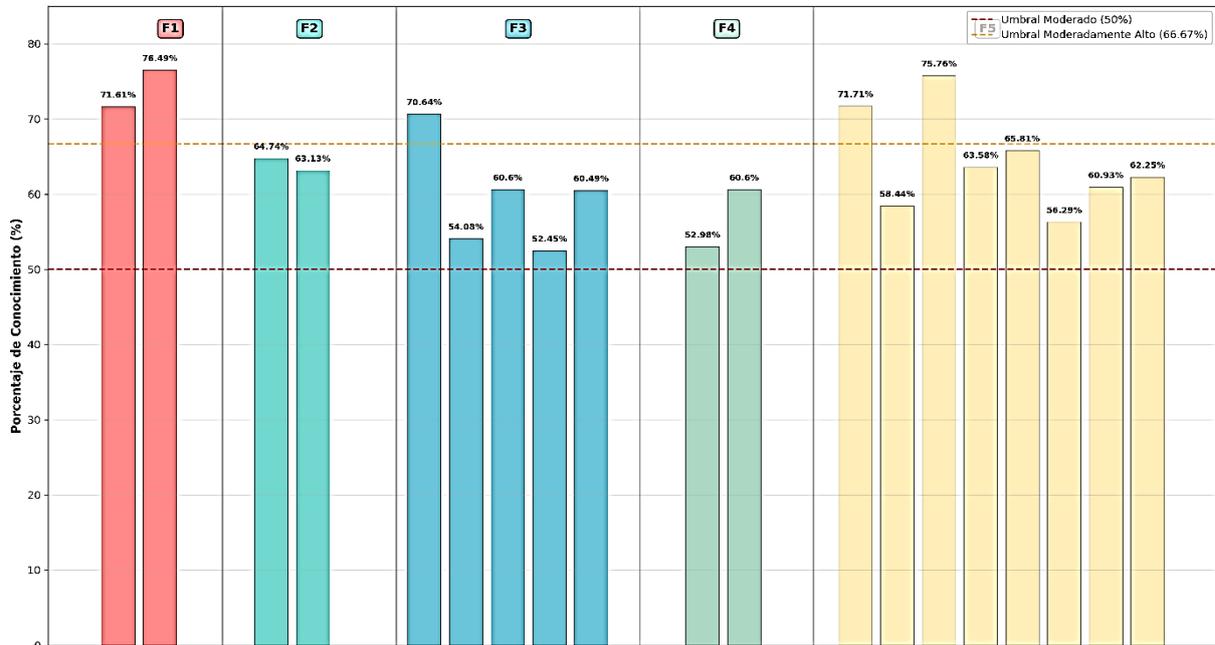


Figure 4. Detailed Analysis by Indicators and Factors

The figure 4 shows the 19 indicators organized according to the five latent factors (F1-F5), allowing for the identification of specific strengths such as financial education and consumer protection (75,76 %) and weaknesses such as public and private sector engagement (52,45 %). Vertical separators delimit each factor, facilitating intra- and inter-factor comparison.

**Structural Equation Modeling (SEM)**  
*Evaluation of the Measurement Model*

The measurement model demonstrated adequate fit according to multiple evaluation criteria. Table 4 presents the goodness-of-fit indices for the SEM model.

Category	Indicator	Observed Value	Acceptable Threshold	Evaluation
Absolute Adjustment	CMIN/DF	1,439	< 3,0	Good fit
Absolute fit	RMR	0,014	≈ 0	Excellent
Absolute Fit	GFI	0,885	> 0,9	Acceptable
Absolute Fit	AGFI	0,842	> 0,9	Acceptable
Incremental Adjustment	NFI	0,828	> 0,9	Acceptable
Incremental Adjustment	CFI	0,939	> 0,9	Good fit
Incremental Adjustment	TLI	0,924	> 0,9	Good fit
Incremental Adjustment	IFI	0,940	> 0,9	Good fit
Approximation	RMSEA	0,054	< 0,06	Good fit
Approximation	PCLOSE	0,332	> 0,05	Good fit
Criteria Information	AIC	302,009	Lower is better	Acceptable
Criteria Information	ECVI	2,013	Lower is better	Acceptable

The table presents a comprehensive assessment of the quality of the model fit using multiple criteria organized by categories: absolute fit, incremental fit, approximation, and information criteria. The results indicate an adequate to good fit in most key metrics.

#### *Absolute Fit Indices*

- Chi-square (CMIN): 200,009 ( $p = 0,001$ )
- Degrees of freedom (DF): 139
- CMIN/DF: 1,439 (< 3, indicates good fit)
- RMR: 0,014 (≈ 0, excellent)
- GFI: 0,885 (slightly below 0,9, but acceptable)
- AGFI: 0,842 (acceptable)

#### *Incremental fit indices*

- NFI: 0,828 (acceptable)
- CFI: 0,939 (> 0,9, good fit)
- TLI: 0,924 (> 0,9, good fit)
- IFI: 0,940 (excellent)

#### *Approximation Indices*

- RMSEA: 0,054 (< 0,06, good fit)
- PCLOSE: 0,332 (> 0,05, not significant, confirms good fit)

#### *Information Criteria*

- AIC: 302,009 (significantly lower than independent model)
- BIC: 455,890
- ECVI: 2,013 (range: 1,789-2,291)

#### *Structural Relationship Analysis*

The analysis of structural relationships between latent factors revealed significant results. Table 5 presents the regression coefficients and their statistical significance.

Relationship	Coefficient (B)	Standard Error	t-value	p-value	Significance	Interpretation
F1 → F5	-0,319	0,385	-0,829	0,401	Not significant	No causal effect
F2 → F5	0,114	0,127	0,898	0,383	Not significant	No causal effect
F3 → F5	1,223	0,521	2,347	0,019	Significant	Strong positive effect
F4 → F5	-0,452	1,401	-0,323	0,747	Not significant	No causal effect

The table shows the causal relationships between latent factors (F1-F5), including regression coefficients, standard errors, p-values, and statistical significance. The F3→F5 relationship is the only statistically significant

one ( $p = 0,019$ ), indicating that the development of financial products has a positive impact on financial inclusion.

Regression coefficients:

- $F1 \rightarrow F5: B = -0,319, p = 0,401$  (not significant).
- $F2 \rightarrow F5: B = 0,114, p = 0,383$  (not significant).
- $F3 \rightarrow F5: B = 1,223, p = 0,019$  (significant).
- $F4 \rightarrow F5: B = -0,452, p = 0,747$  (not significant).

The only significant coefficient corresponds to the relationship  $F3 \rightarrow F5$  (Comprehensive Financial Inclusion Strategy  $\rightarrow$  Financial Inclusion and Access to Services), with  $B = 1,223$  and  $p = 0,019$ . This result indicates that for each unit increase in  $F3$ ,  $F5$  increases by 1,223 units, suggesting a positive and substantial effect of financial product development on financial inclusion.

*Covariances between Factors*

All covariances between latent factors were statistically significant ( $p < 0,001$ ), indicating positive correlations between:

- $F4 \leftrightarrow F2, F2 \leftrightarrow F3, F1 \leftrightarrow F4, F1 \leftrightarrow F2, F1 \leftrightarrow F3, F4 \leftrightarrow F3$

These correlations suggest that the factors are significantly interrelated, although not necessarily in direct causal relationships.<sup>(37)</sup> Figure 5 presents a visualization of these correlations.



Figure 5. Correlation Matrix between Latent Factors

The heat map shows the correlations between the five latent factors (F1-F5), with values ranging from moderate to high correlations. The F3-F5 relationship is highlighted with a red box, indicating the only causally significant relationship identified in the model ( $p = 0,019$ ). The more intense colors represent stronger correlations.

*Variances and Model Validation*

The variances of the latent factors were all significant ( $p < 0,001$ ), confirming that each factor explains a substantial proportion of the variability in its observed indicators. The variance values were: F1 (0,847), F2 (0,623), F3 (0,891), F4 (0,798), and F5 (0,924).

Convergent validity was confirmed by factor loadings greater than 0,5 for all indicators, with most exceeding 0,7. Discriminant validity was assessed using the Fornell-Larcker criterion, confirming that each factor shares more variance with its own indicators than with other factors.<sup>(38)</sup>

**DISCUSSION**

The results of this study reveal a complex picture of financial inclusion in Ecuador, characterized by moderate progress in knowledge of the regulatory framework (74,05 %), but with significant challenges in the practical

implementation of policies and programs. This observation is consistent with the findings of Demirguc-Kunt et al.<sup>(5)</sup>, who identified similar gaps between regulatory knowledge and effective implementation in emerging Latin American economies. Similarly, Beck et al.<sup>(6)</sup> documented that regulatory knowledge alone does not guarantee effective financial inclusion, requiring practical translation mechanisms. The results of this study confirm these findings, showing that the commitment of the public and private sectors (52,45 %) and inter-institutional coordination (60,49 %) perform significantly worse than knowledge of the regulatory framework, suggesting a disconnect between regulatory design and its operational implementation.

The finding of a statistically significant relationship between the development of financial products and effective financial inclusion is a relevant contribution that confirms previous theoretical approaches. This result suggests that innovation in financial products adapted to local needs is a determining factor in improving effective financial inclusion, which is in line with the postulates of Paredes Cruz et al.<sup>(1)</sup>, who highlight that management styles in popular and solidarity finance have a relevant impact on the sustainability of these initiatives. The empirical evidence obtained in this study supports the importance of developing specific financial products for different population segments, particularly in popular and solidarity economy contexts such as Ecuador. This causal relationship identified through the structural equation model allows us to understand that improvements in financial inclusion do not depend solely on the availability of services, but also on the capacity for innovation and adaptation of products to the characteristics and needs of the target population.

Accessibility to financial services is significantly improved when institutions develop effective infrastructures and targeted strategies. The findings of this study, which show a moderate level (63,93 %) of implementation of financial access programs, are consistent with research highlighting the positive impact of fintech and mobile money platforms in reducing geographical and economic barriers.<sup>(39)</sup> These advances allow a greater number of users, especially in rural areas, to access essential financial services.

Casamen Gualotuña<sup>(3)</sup> emphasizes the importance of financial service quality for customer satisfaction, which is directly related to this study's findings on the need to improve the implementation of access programs.

The regulatory and legal framework focuses on ensuring the stability and security of the financial system, which can limit its direct impact on the inclusion of underserved users. The results of this study show that knowledge of the regulatory framework is moderately high (74,05 %), but the regulatory and governance framework performs less well (56,79 %).

In various institutional contexts, regulations are often designed more to protect the system than to remove barriers to access. This logic prioritizes the preservation of administrative structures over the real needs of users. As a result, mechanisms that hinder the full and equitable participation of certain groups are maintained.<sup>(40)</sup> This translates into an unbalanced approach that prioritizes transparency and basic consumer rights over proactive accessibility strategies. The findings of this study confirm this perspective, showing that, although there is knowledge of regulations, their translation into effective inclusion policies has limitations.

In this context, the private sector emerges as a key player in promoting financial inclusion. The results of this study reveal that the commitment of the public and private sectors has the lowest score (52,45 %), highlighting a critical gap that requires immediate attention. Velandia del Rio<sup>(7)</sup> shows that fintech and other private entities are more agile and better positioned to develop innovative and accessible solutions.

Collaboration between the public and private sectors could be an effective solution for aligning financial inclusion objectives with the capabilities and flexibility of the private sector. This assertion is based on international evidence documented by Claessens<sup>(16)</sup> who demonstrated that public-private partnerships in the field of financial inclusion allow for the combination of the regulatory and public policy capacity of the government sector with the agility, innovation, and operational efficiency of the private sector. Additionally, Khera et al.<sup>(13)</sup> showed that countries that have made the most progress in digital financial inclusion have implemented structured collaboration frameworks between both sectors. The findings of this study suggest that strengthening these partnerships is essential to improve inter-institutional coordination, which currently performs moderately (60,49 %), and to translate regulatory knowledge into effective practical implementation.

Financial education emerges as a relative strength in the results, reaching 75,76 % in financial education and consumer protection. This finding is relevant considering that financial education is a key element for vulnerable users to benefit from financial services.

Studies indicate that informed users are better prepared to make safe financial decisions, which reduces vulnerability and the risk of long-term financial exclusion.<sup>(41)</sup> However, despite these relatively high scores, financial user protection performs less well (56,29 %), suggesting that there is a gap between recognition of the importance of financial education and its effective implementation in terms of practical protection. This finding suggests that, although there is recognition of the importance of developing tailored products, practical implementation faces challenges.

International literature emphasizes that financial products designed specifically for vulnerable segments, such as microloans and simplified savings accounts, are fundamental to effective inclusion.<sup>(42)</sup> The results of this study confirm that innovation in financial products is a determining factor, but requires further development to reach its full potential.

Inter-institutional coordination shows moderate performance (60,49 %), reflecting challenges in coordination between different actors in the financial system. This finding is consistent with studies that highlight the importance of effective coordination between public, private, and civil society institutions for the success of financial inclusion policies. The lack of effective coordination can result in duplication of efforts, inefficient use of resources, and contradictory policies that limit the impact of financial inclusion initiatives.<sup>(43)</sup> The results suggest that strengthening coordination mechanisms should be a priority to improve the overall effectiveness of the system.

The findings of this study have important implications for the design and implementation of financial inclusion policies in Ecuador. The significant relationship between financial product development and inclusion suggests that policies should prioritize innovation and adaptation of products to the specific needs of different population segments.

The gap identified between regulatory knowledge and practical implementation indicates the need to strengthen mechanisms for translating policies into concrete actions. This requires not only solid regulatory frameworks, but also institutional capacities for their effective implementation. In the authors' opinion, this disconnect represents one of the most critical challenges to advancing financial inclusion in Ecuador, as it limits the potential impact of well-designed regulations.

Comparing these results with the international literature, it can be seen that this problem is not unique to Ecuador. Bayar et al.<sup>(15)</sup> identified similar patterns in post-communist countries of the European Union, where regulatory development significantly exceeded practical implementation capacity. However, the Ecuadorian case has particularities related to the duality of the financial system (traditional banking and the popular and solidarity economy) that require more complex coordination approaches than those documented in other contexts.

The authors consider that innovation in financial products, identified as a determining factor in this study, must be accompanied by three complementary elements to maximize its impact: first, strengthening financial education (currently at 75,76 %) to ensure the appropriate use of innovative products; second, substantial improvement in inter-institutional coordination (currently at 60,49 %) to avoid duplication of efforts; and third, a significant increase in the commitment of the public and private sectors (currently at 52,45 %), which represents the most critical gap identified.

A comparison of these results with the findings of Velandia del Rio<sup>(7)</sup> on strategic financial models for microenterprises reveals important convergences. Both studies identify that the adaptation of financial products to the specific characteristics of users is more decisive than the simple availability of services. This convergence strengthens the external validity of the findings and suggests that the conclusions may be applicable to other contexts of emerging economies with similar characteristics.

Finally, the authors emphasize that the results obtained using the structural equation model allow us to go beyond the simple correlations documented in previous studies, establishing causal relationships that can guide the design of more effective public policies. This methodological contribution represents a significant advance in research on financial inclusion in the Ecuadorian context, where descriptive or correlational studies predominate.

## CONCLUSIONS

Innovation in financial products, as a key component of a comprehensive inclusion strategy, is the determining factor for improving financial inclusion in Ecuador. The results of this study highlight the need to strengthen public-private partnerships and improve inter-institutional coordination in order to translate regulatory knowledge into practical and effective implementation. Although the regulatory framework is solid, its impact on financial inclusion is limited by the lack of a comprehensive strategy to coordinate the efforts of different actors and promote innovation.

The study also reveals the importance of financial education and consumer protection, which, although not analyzed as direct causal factors, are essential elements in ensuring that financial inclusion is sustainable and benefits the entire population. In this regard, it is essential that financial inclusion policies focus not only on increasing access to financial services, but also on ensuring that users have the skills and confidence to use them effectively and safely.

In conclusion, to move toward sustainable financial inclusion in Ecuador, it is necessary to adopt a comprehensive and coordinated approach that goes beyond simply providing access to financial services. This approach should focus on innovation, coordination, and user empowerment, with the ultimate goal of improving the well-being of the entire population.

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