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Who uses non-bank credit cards? Evidence from Chilean households and insights for financial inclusion and retail credit strategies

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Abstract

Purpose – This study examines the determinants of non-bank credit card adoption using nationally representative household data from Chile. While prior research has largely focused on bank-issued credit cards, non-bank credit cards, particularly those issued by retailers and non-bank institutions, have expanded significantly in emerging markets. This paper investigates whether financial ecosystem engagement, including digital financial use and financial depth, plays a more important role than traditional demographic characteristics in explaining non-bank credit card ownership.

Design/methodology/approach – Using data from the 2024 Chilean Household Financial Survey, the study estimates survey-adjusted probit models to analyze non-bank credit card ownership. Independent variables include financial access, financial depth, digital financial use, traditional financial use and sociodemographic characteristics. Factor analysis is used to construct behavioral financial use indices, and sequential model specifications, robustness checks and Wald tests are employed to assess model stability and variable contributions.

Findings – The results show that financial ecosystem engagement, particularly digital financial use and financial depth, is more strongly associated with non-bank credit card adoption than traditional demographic characteristics. Income, age and household size are positively associated with adoption, while education becomes statistically insignificant and turns negative after controlling for financial engagement variables. These findings suggest that non-bank credit cards are primarily adopted by households already integrated into formal financial systems rather than serving as entry-level financial inclusion tools.

Originality/value – This study contributes to the household finance and financial inclusion literature by distinguishing between bank and non-bank credit cards and emphasizing financial ecosystem participation as a key determinant of adoption. It also provides new empirical evidence from Chile, a relevant emerging market with a strong retail credit presence, offering insights for policymakers, retailers and non-bank financial institutions.

Keywords Non-bank credit cards, Financial inclusion, Household finance, Digital financial engagement, Financial depth, Chile

Paper type Research article

1. Introduction

Credit cards issued by non-bank institutions, particularly retailers and commercial firms, have become an increasingly important component of consumer credit markets worldwide. These financial products differ from traditional bank-issued credit cards in their institutional origin, distribution channels, and strategic objectives (OECD, 2020). While bank credit cards primarily function as general-purpose financial instruments, non-bank credit cards are typically embedded within retail ecosystems and designed to support consumption, strengthen customer relationships, and expand commercial activity (Sirakova-Yordanova, 2024). This hybrid financial-commercial nature makes non-bank credit cards conceptually distinct from conventional banking products and raises important questions regarding the determinants of their adoption (Azevedo *et al.*, 2018).

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Despite the growing relevance of non-bank credit instruments, the empirical literature has largely focused on bank credit card adoption and general financial inclusion measures (Isayev, 2026). Studies in household finance typically analyze credit card ownership as a unified category, without distinguishing between bank-issued and non-bank cards (Gandelman *et al.*, 2025; Chen *et al.*, 2024; Campbell, 2006; Choi and DeVaney, 1995). However, non-bank credit cards operate under different incentives, targeting strategies, and customer segments. Retailers often use credit products to stimulate consumption, increase purchase frequency, and strengthen customer engagement within their commercial platforms. As a result, the drivers of non-bank credit card adoption may differ from those associated with traditional bank credit products (Azevedo *et al.*, 2018).

Beyond access, the way individuals use credit instruments reflects underlying financial conditions and risk profiles. In particular, spending patterns and repayment behavior provide important signals about consumers' financial health, with certain consumption categories being associated with higher financial vulnerability (Bakhtiari *et al.*, 2026).

This distinction is particularly relevant in emerging economies, where non-bank financial institutions and retail-based credit have expanded rapidly (Isayev, 2026). In Latin America, large retailers and commercial platforms have developed extensive credit operations, often competing directly with banks in consumer finance markets (OECD, 2024). Chile provides a particularly relevant setting for studying this phenomenon, as retailer-issued credit cards have historically played a central role in consumer credit markets and financial inclusion dynamics (Lemus and Rojas, 2022). Nevertheless, empirical evidence on who adopts non-bank credit cards and how adoption relates to financial engagement remains limited.

Credit behavior has been identified as a central determinant of financial well-being, particularly in emerging economies where formal and alternative financial systems coexist. In these contexts, individuals' ability to manage credit obligations and diversify financial instruments plays a critical role in shaping financial outcomes (Hernandez-Zuluaga *et al.*, 2025).

Existing literature suggests several potential drivers of credit product adoption, including income (Bird *et al.*, 1999), education (Gan *et al.*, 2016), age (Nai *et al.*, 2018), and household characteristics (Lusardi and Mitchell, 2014; Fogel and Schneider, 2011; Ekici and Dunn, 2010; Campbell, 2006). However, recent research in financial inclusion and digital finance indicates that participation in broader financial ecosystems, such as digital payments, account ownership, and financial product portfolios, may play a more important role in shaping financial product adoption (Trotta *et al.*, 2026; OECD, 2024; Vives, 2016). From this perspective, non-bank credit cards may be adopted as complementary financial tools by households already engaged in formal financial systems, rather than as entry-level credit instruments (Isayev, 2026).

The expansion of digital financial ecosystems has transformed how individuals engage with credit instruments. Digital financial literacy, in particular, influences not only access to financial services but also the purpose and intensity of credit usage, shaping more strategic financial behavior (Jiang *et al.*, 2026). Although prior research has examined financial behavior, digital engagement, and credit usage, these streams have often evolved in parallel, with limited integration at the household level. As a result, there remains a gap in understanding how different dimensions of financial engagement jointly shape the adoption of specific credit instruments (Leong *et al.*, 2026).

This study examines the determinants of non-bank credit card adoption using data from a nationally representative household survey in Chile. Specifically, it analyzes how financial access, financial usage patterns, digital participation, and sociodemographic characteristics relate to the likelihood of owning a non-bank credit card. By distinguishing between traditional and digital financial usage, and between access and level of financial participation, the study aims to provide a more nuanced understanding of households' credit portfolio decisions.

Importantly, this study adopts an associational rather than causal interpretation, given the cross-sectional nature of the data. The analysis focuses on identifying patterns of adoption and

their correlation with financial ecosystem participation, rather than establishing causal mechanisms. This approach aligns with recent research emphasizing the descriptive and exploratory value of large-scale household financial data, particularly in emerging markets where product-level evidence remains limited.

This paper makes three contributions to the literature. First, it shifts empirical attention from bank-issued credit cards to non-bank credit cards, a growing but underexamined segment of consumer finance markets. While prior research has examined general credit card adoption, relatively little evidence exists on retailer-issued credit products and their determinants, particularly in emerging economies.

Second, the study contributes to the financial inclusion and household finance literature by examining how financial ecosystem participation, measured through financial access, digital financial use, and financial depth, relates to non-bank credit card adoption. This approach extends existing frameworks by distinguishing between product ownership and behavioral financial engagement.

Third, the paper provides new empirical evidence from Chile using recent nationally representative survey data. Chile represents an important case due to the strong presence of retail-based credit markets and the coexistence of traditional banking and non-bank financial institutions. The findings therefore contribute to understanding credit market segmentation and financial product adoption in emerging economies.

The remainder of the paper is structured as follows. Section 2 develops the theoretical framework and hypotheses. Section 3 describes the data and methodology. Section 4 presents the empirical results. Section 5 discusses the findings and their implications, and Section 6 concludes.

2. Theoretical framework and hypothesis development

2.1 Non-bank credit cards as retail-embedded financial products

Non-bank credit cards differ fundamentally from bank-issued credit cards in their economic purpose, distribution channels, and strategic role (Azevedo *et al.*, 2018). While bank credit cards function primarily as general-purpose financial instruments, non-bank credit cards, often issued by retailers or non-bank financial institutions, are embedded within commercial ecosystems and designed to increase spending, strengthen customer loyalty, and enhance long-term customer relationships (Patalano and Roulet, 2020). This distinction aligns with the broader literature on retail credit and consumer finance, which highlights that merchant-issued credit instruments serve both financing and marketing purposes, creating hybrid financial-commercial products (Durkin, 2000; Worthington and Hallsworth, 1999).

Early research on retailer credit cards highlights their strategic value in marketing and customer retention. Retailer-issued cards allow firms to segment customers, implement targeted promotions, and increase purchase frequency, while credit purchases often exceed comparable cash purchases (Worthington and Hallsworth, 1999).

Similarly, Murphy and Ott (1977) argue that retail credit cards allow firms to influence revenues through differentiated payment structures, thereby expanding consumer demand and facilitating higher transaction volumes.

Research on customer loyalty also shows that non-bank credit cards function as marketing tools that strengthen trust, commitment, and satisfaction within competitive retail environments (Roberts-Lombard *et al.*, 2025; Cardoso *et al.*, 2022; Guiñez-Cabrera and Vasquez-Parraga, 2018).

More recent work further suggests that non-financial firms increasingly cross-sell credit products to customers already engaged in their commercial platforms, reinforcing the idea that non-bank credit cards function as complementary financial products within a broader commercial ecosystem rather than as primary access to credit (Murinde *et al.*, 2022).

This conceptualization is consistent with the broader financial intermediation literature, which emphasizes that credit products often emerge as complementary services within customer relationships and consumption ecosystems (Boot, 2000; Petersen and Rajan, 1997).

Therefore, non-bank credit card adoption is expected to depend on financial ecosystem participation rather than solely on traditional banking relationships (Isayev, 2026).

2.2 Financial depth and credit portfolio expansion

Financial depth refers to the extent of household participation in multiple financial services (World Bank Group, 2026; Emara, 2025; Mbona, 2022; Pradhan *et al.*, 2017). Households with greater financial depth typically exhibit greater familiarity with financial instruments, lower informational barriers, and stronger exposure to credit opportunities (Madeira, 2021). Financial inclusion literature suggests that households expand their use of financial services as they become more integrated into formal financial systems (Herrero *et al.*, 2025; Allen *et al.*, 2016; Beck *et al.*, 2007).

Retail credit literature indicates that lenders rely on observable consumer characteristics and statistical credit scoring models to identify potential borrowers (Markov *et al.*, 2022). These models allow firms to efficiently expand credit offerings to financially engaged households (Nguyen *et al.*, 2024).

Choi and DeVaney (1995) find that households frequently hold multiple credit cards, including both bank and retail cards, suggesting that credit adoption reflects portfolio expansion rather than substitution. Their findings also indicate that households holding multiple cards exhibit favorable credit attitudes and stronger socioeconomic characteristics.

Similarly, Ho *et al.* (2021) show that retailer credit accounts differ systematically across customer segments and store types, suggesting that financially engaged households are more likely to adopt retailer-based credit products.

These findings are consistent with household portfolio theory, which suggests that households diversify financial products as their financial sophistication increases (Guiso and Sodini, 2013; Campbell, 2006).

H1. Financial depth is positively associated with non-bank credit card adoption.

2.3 Digital financial engagement

Digitalization has transformed credit markets and consumer financial behavior (Başar *et al.*, 2025). Digital financial engagement includes debit card usage, electronic payments, and online financial transactions, reflecting participation in modern financial ecosystems (El Amri *et al.*, 2026). Financial technology research emphasizes that digital financial tools reduce transaction costs and expand access to credit and financial services (Shahen and Sharaf, 2025; Vives, 2016).

Financial knowledge and digital financial literacy play a critical role in shaping financial behavior, influencing how individuals evaluate financial products, manage risk, and engage with credit instruments (Sandoval *et al.*, 2025).

Research shows that credit tools embedded in digital retail environments increase purchasing behavior and facilitate credit adoption (Jiang and Stylos, 2021). Buy-now-pay-later and retail credit tools in online commerce environments are associated with impulse purchasing and increased credit adoption (Ah Fook and McNeill, 2020).

Additionally, research on credit card fraud and transaction systems emphasizes the growing role of digital payment infrastructures and data analytics in shaping credit card adoption and usage (Shahen and Sharaf, 2025). These systems increase exposure to credit offers and reduce transaction friction.

This argument is also consistent with technology adoption models, which suggest that digital familiarity increases the likelihood of adopting new financial services (Davis, 1989; Venkatesh *et al.*, 2003).

H2. Digital financial engagement is positively associated with non-bank credit card adoption.

2.4 Traditional financial use

Traditional financial behavior reflects conventional banking routines such as checks and automatic bill payments (Gaviyau and Godi, 2025). These practices may not strongly relate to retailer-based credit adoption, particularly as non-bank credit cards are increasingly embedded in digital commerce ecosystems (Islam and Ferrer, 2025).

Financial innovation literature suggests that new financial products may substitute traditional financial practices as technology adoption increases (Frame and White, 2012; Beck *et al.*, 2015).

Research on retailer credit behavior suggests that consumer credit usage varies across store formats and customer types, implying that traditional financial behavior may not be a strong predictor of non-bank credit adoption (Ho *et al.*, 2021).

H3. Traditional financial use is not significantly associated with non-bank credit card adoption.

2.5 Income and consumption-based credit demand

Income is one of the most consistent determinants of credit adoption. Higher-income households typically have greater purchasing capacity and are more likely to qualify for credit products. Household finance literature consistently identifies income as a central determinant of credit use (Campbell, 2006; Jappelli and Pagano, 1994). Choi and DeVaney (1995) show that income significantly influences credit card ownership and usage patterns.

Retail credit literature also indicates that credit cards increase consumption by enabling flexible payment structures and installment financing (Murphy and Ott, 1977).

H4. Household income is positively associated with non-bank credit card adoption.

2.6 Education and credit product substitution

Education is typically associated with financial literacy and product adoption (Lusardi and Mitchell, 2014). However, more educated households may prefer bank-issued credit cards rather than retailer-based credit instruments.

Research shows that determinants differ across credit card types, suggesting that education may influence credit portfolio composition (Choi and DeVaney, 1995).

This substitution mechanism is consistent with financial sophistication theory, which suggests that more educated households select more efficient financial products (Guiso and Sodini, 2013).

H5. Education is negatively associated with non-bank credit card adoption.

2.7 Age and lifecycle effects

Age reflects financial experience and lifecycle effects. Lifecycle theory suggests that households accumulate financial knowledge and diversify financial portfolios over time (Modigliani and Brumberg, 1954; Campbell, 2006).

Research indicates that older households may exhibit distinct retail credit usage patterns, including increased adoption of retailer credit products (Choi and DeVaney, 1995).

H6. Age is positively associated with non-bank credit card adoption.

2.8 Household size and credit demand

Household size influences credit demand through increased consumption needs. Larger households may rely more on credit products to smooth consumption. Consumption

smoothing theory suggests households use credit to manage expenditure variability (Deaton, 1992).

Retail credit historically facilitates installment financing and household purchases, particularly in consumer credit markets (Ashby *et al.*, 2025).

H7. Household size is positively associated with non-bank credit card adoption.

2.9 Behavioral and marketing mechanisms

Non-bank credit cards also function as marketing instruments. Retailers use credit cards to stimulate consumption, increase purchase frequency, and strengthen loyalty relationships (Worthington and Hallsworth, 1999).

Behavioral finance literature suggests that credit products embedded in retail environments may exploit behavioral biases such as present bias and impulse purchasing (Thaler, 1985; Laibson, 1997).

Additionally, firms may cross-sell credit products based on behavioral insights and customer data (Murinde *et al.*, 2022).

2.10 Financial ecosystem integration

In this manner, the literature suggests that non-bank credit card adoption is primarily driven by financial ecosystem integration. Households with greater financial depth and digital engagement are more likely to adopt complementary credit products embedded within retail ecosystems. This perspective aligns with modern financial intermediation theory and platform-based financial services literature (Boot, 2000; Vives, 2016).

H8. Financial ecosystem integration is more strongly associated with non-bank credit card adoption than traditional demographic factors.

3. Material and methods

3.1 Data and sample

This study uses data from the 2024 Chilean Household Financial Survey, a nationally representative dataset designed to capture household financial behavior, access to financial products, and socioeconomic characteristics. The survey includes detailed information on financial product ownership, payment instrument usage, demographic characteristics, and household financial conditions.

The survey follows a complex probabilistic sampling design, including stratification, clustering, and survey weights to ensure representativeness at the national level. All empirical estimations incorporate survey weights and replicate weights to obtain unbiased population estimates and correct standard errors (Central Bank of Chile, 2025).

After removing observations with missing information in key variables, the final analytical sample consists of households with complete information on credit card ownership, financial access, financial use, and socioeconomic characteristics.

This dataset provides a unique opportunity to examine non-bank credit card adoption because it distinguishes between bank-issued credit cards and non-bank credit cards, allowing for a more precise analysis of credit portfolio composition.

3.2 Dependent variable

The dependent variable is non-bank credit card ownership, defined as a binary indicator equal to one if the household reports holding at least one non-bank credit card, and zero otherwise.

Non-bank credit cards include credit products issued by retail stores, department stores, commercial platforms, and non-bank financial institutions. This distinction is central to the study because non-bank credit cards differ from bank-issued credit cards in their institutional

origin and commercial purpose. The analysis focuses on ownership rather than usage intensity, consistent with prior household finance research examining credit product adoption.

3.3 Independent variables

Table 1 presents the definition, measurement, and expected direction of all variables included in the empirical models. Following the theoretical framework, the explanatory variables are grouped into three dimensions: financial access, financial use, and sociodemographic characteristics. Financial access is captured through bank account access and bank account depth. Financial use is represented by two factor-based indices: traditional financial use and digital financial use. In addition, the models include standard household finance controls such as age, age squared, income, education, gender, household size, employment status, and geographic macrozone. This tabular presentation improves transparency and facilitates interpretation of the empirical specification.

3.4 Construction of financial access measures

To measure households' access to the formal financial system, two binary indicators available in the dataset were used: ownership of a checking account and ownership of a basic transaction account (see Table 2).

Given the limited number of property variables and their binary nature, a latent index was not constructed using principal component analysis (PCA) or exploratory factor analysis (EFA). Factor-based methods require a sufficient number of indicators to identify stable and interpretable latent structures. With only two binary variables, such techniques are not appropriate, as they tend to produce unstable or theoretically ambiguous solutions. In preliminary analyses, factor-based approaches produced opposing loadings across indicators, suggesting that the resulting factor would capture differences in account type rather than the intended concept of financial access (Schreiber, 2021).

Table 1. Definition of variables

Variable	Definition	Type	Coding/Measurement
Bank account access	Household holds at least one bank account (checking or basic)	Independent	1 = yes; 0 = no
Bank account depth	Number of bank accounts held by the household	Independent	Count: 0–2
Traditional financial use	Index of conventional financial practices	Independent	Factor score
Digital financial use	Index of digitally mediated financial practices	Independent	Factor score
Centered age	Age of respondent centered around the sample mean	Control	Continuous
Centered age squared	Squared centered age	Control	Continuous
Log income	Natural logarithm of household income	Control	Continuous
Log education	Natural logarithm of years of schooling/ educational attainment	Control	Continuous
Male	Gender of respondent	Control	1 = male; 0 = female
Household size	Number of household members	Control	Count
Occupied	Employment status of respondent	Control	1 = employed; 0 = otherwise
Macrozone: Center	Geographic control	Control	1 = yes; 0 = otherwise
Macrozone: South	Geographic control	Control	1 = yes; 0 = otherwise
Macrozone: Metropolitan Region	Geographic control	Control	1 = yes; 0 = otherwise

Source(s): Self-made

Table 2. Financial access variables

Variable	Definition	Type
Bank account access	Equals 1 if the household holds at least one bank account (checking or basic), 0 otherwise	Binary
Bank account depth	Number of bank accounts held (0–2)	Count

Note(s): The adequacy of the data for factor analysis was confirmed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity, reported in Appendix 1. - Descriptive distributions of financial access variables are reported in Appendix 2 and 3

Source(s): Self-made

Moreover, account ownership reflects observable financial inclusion rather than a latent behavioral or attitudinal construct. Therefore, combining these variables through factor analysis would not yield meaningful theoretical interpretation.

In line with the literature on financial inclusion, two complementary measures were constructed instead. First, a binary indicator of financial access, equal to one if the household holds at least one bank account. Second, a count-based measure of financial depth, defined as the number of bank accounts held (ranging from zero to two). These measures provide a transparent and interpretable representation of both access to and depth of participation in the formal financial system.

3.5 Construction of financial use indices

To capture behavioral interaction with financial services, two indices were constructed based on the reported use of certain financial instruments (see Table 3). Unlike financial access, which reflects observable product ownership, financial use represents a behavioral dimension of financial participation. Therefore, EFA was used to identify the underlying structure of financial services use (Costello and Osborne, 2005).

The study began with a set of binary indicators reflecting the use of different financial instruments, such as debit cards, checks, automatic bill payments, bank transfers, prepaid card transactions, and direct debits. Given the dichotomous nature of these variables, the factor structure was estimated using a polychoric correlation matrix. Maximum likelihood extraction with oblimin rotation was employed, allowing for the consideration of correlated latent dimensions.

Preliminary estimation indicated that cash use and general prepaid card use did not load meaningfully on any factor and were therefore excluded from the final specification

Table 3. Factor structure of financial use (rotated loadings)

Variable	Traditional use	Digital use
Check use	0.638	
Automatic bill payment	0.688	
Automatic debit arrangements	1.013	
Debit card use		0.726
Bank transfers		0.953
Prepaid card transactions		0.525

Note(s): Loadings below 0.30 are suppressed. Estimates are based on a polychoric correlation matrix using maximum likelihood extraction and oblimin rotation. Reported coefficients correspond to pattern loadings. - Values slightly above unity may occur in oblique factor models when items are highly concentrated on a single factor and factors are correlated

Source(s): Self-made

to improve interpretability. The excluded variables and their justification are reported in Appendix 4.

The final model identifies two distinct and theoretically interpretable dimensions (the explained variance of the extracted factors is reported in Appendix 5). The first factor captures traditional financial use, primarily associated with checks and automated payment arrangements. The second factor captures digital financial use, reflected in debit card transactions, bank transfers, and prepaid card transactions.

Factor scores are estimated using the Thurstone method and standardized prior to inclusion in the regression analysis. The correlation between the extracted factors is reported in Appendix 6. This distinction is central to the empirical strategy, as it allows us to separately assess the role of traditional and digital financial engagement in non-bank credit card adoption.

3.6 Econometric strategy

To examine the determinants of non-bank credit card adoption, survey-adjusted probit models were estimated. Given the binary nature of the dependent variable, probit estimation provides an appropriate framework for modeling adoption probabilities (Maddala, 1983; McFadden, 1974). The baseline specification is defined as:

$$P(Y_i = 1) = \Phi(\beta_0 + \beta_1 FA_i + \beta_2 FU_i + \beta_3 Socioeconomic_i + \varepsilon_i)$$

Where:

Y_i indicates non-bank credit card ownership

FA_i includes bank account access and depth

FU_i includes traditional and digital use indices

$Socioeconomic_i$ includes demographic and socioeconomic controls

The models are estimated sequentially to assess the incremental contribution of different variable blocks:

(1) Education-only model

(2) Income model

(3) Socioeconomic baseline model

(4) Financial inclusion model

(5) Full specification model

This sequential approach allows evaluation of coefficient stability and helps assess potential suppression effects, particularly between education and income variables, as suggested in the literature.

3.7 Robustness checks

Several robustness checks are conducted to assess the stability of the results:

(1) Alternative model specifications are estimated (Greene, 2018) excluding financial access variables and excluding financial use variables separately. This allows evaluation of the relative contribution of financial access versus financial behavior.

(2) Wald tests are conducted to evaluate the joint significance of variable blocks (Wooldridge, 2010), including: (1) Financial access variables; (2) Financial use variables, and; (3) Sociodemographic variables.

(3) Sequential model building is implemented to examine coefficient stability and potential multicollinearity effects (Greene, 2018).

These robustness checks help ensure that the results are not driven by model specification choices.

3.8 Limitations

This study relies on cross-sectional survey data, which limits causal interpretation. The results should therefore be interpreted as associations rather than causal effects. Additionally, the dataset captures credit card ownership but does not include information on: (1) Credit limits; (2) Debt levels; (3) Repayment behavior, and; (4) Financial stress. As a result, the analysis focuses on adoption patterns rather than credit outcomes or welfare effects. Despite these limitations, the dataset provides valuable insights into household credit portfolio composition and financial ecosystem participation. Additional descriptive statistics and factor diagnostics are provided in the Appendices.

Additionally, the correlation between the traditional financial use and digital financial use indices (0.591) indicates that these dimensions are not orthogonal. While both variables are included to capture distinct aspects of financial behavior, this non-trivial correlation suggests that their estimated coefficients should be interpreted as partial effects conditional on shared variance, rather than as fully independent contributions.

4. Results

4.1 Descriptive statistics

The descriptive analysis provides preliminary evidence on the relationship between non-bank credit card holding and key financial access and socioeconomic characteristics. Table 4 reports weighted proportions and design-adjusted Rao–Scott chi-square tests to account for the complex survey structure.

The results indicate significant differences in non-bank credit card holding across financial inclusion indicators. In particular, individuals without access to bank accounts exhibit a substantially lower probability of holding a non-bank credit card (4.03%), compared to those with bank access (27.15%). Similarly, a clear gradient emerges when considering banking depth: the proportion of individuals holding non-bank credit cards increases from 4.03% among those without bank accounts to 39.68% among those holding two accounts.

Regional differences are also statistically significant. Individuals living in northern and central regions show higher non-bank credit card usage compared to those in the southern region and the Metropolitan Region. Employment status also plays an important role, with employed individuals exhibiting a higher likelihood of holding non-bank credit cards (28.08%) compared to unemployed individuals (19.25%).

Age and income also demonstrate meaningful patterns. Non-bank credit card holding increases with income quintiles, rising from 11.04% in the lowest quintile to 38.03% in the highest quintile. Similarly, middle-age individuals (30–59 years) exhibit higher usage compared to younger and older groups. In contrast, gender differences are not statistically significant, suggesting similar adoption patterns between men and women.

These descriptive findings provide preliminary evidence that financial inclusion, income level, and demographic characteristics are strongly associated with non-bank credit card holding.

4.2 Sequential survey-probit models

Table 5 presents sequential survey-probit models examining determinants of non-bank credit card holding. The results show three key patterns. First, income is consistently positive and

Table 4. Non-bank credit card holding by financial access and socioeconomic characteristics

Variable	Category	Non-holder (%)	Holder (%)	*p*-value
Bank account access	No Access	95.97	4.03	<0.001
	Access	72.85	27.15	<0.001
Bank account depth	0 Accounts	95.97	4.03	<0.001
	1 Account	82.91	17.09	<0.001
	2 Accounts	60.32	39.68	<0.001
Gender	Female	74.75	25.25	0.417
	Male	73.2	26.8	0.417
Macrozone	North	68.79	31.21	<0.001
	Center	68.83	31.17	<0.001
	South	74.1	25.9	<0.001
	Metropolitan Region	78.24	21.76	<0.001
Employment status	Unemployed	80.75	19.25	<0.001
	Employed	71.92	28.08	<0.001
Age group	18–29	78.63	21.37	0.042
	30–44	73.06	26.94	0.042
	45–59	69.94	30.06	0.042
	60+	76.98	23.02	0.042
Income quintile	Q1	88.96	11.04	<0.001
	Q2	75.53	24.47	<0.001
	Q3	74.35	25.65	<0.001
	Q4	65.43	34.57	<0.001
	Q5	61.97	38.03	<0.001

Note(s): Percentages correspond to weighted proportions based on survey expansion factors. - Statistical significance is assessed using the Rao–Scott adjusted chi-square test to account for the complex survey design. - Non-holder refers to individuals without non-bank credit cards, while holder refers to individuals possessing at least one non-bank credit card

Source(s): Self-made

Table 5. Sequential survey-probit models for non-bank credit card holding

Variables	Model 1: Education model	Model 2: Income model	Model 3: Baseline socioeconomic model	Model 4: Financial inclusion model
Log education	0.2838† (0.1552)		0.0002 (0.1328)	−0.3029** (0.1125)
Log income		0.3393*** (0.0334)	0.3378*** (0.0357)	0.1527*** (0.0385)
Traditional financial use				−0.009 (0.0511)
Digital financial use				0.2846*** (0.0613)
Bank account access				−0.1576 (0.2144)
Bank account depth				0.4740*** (0.0704)
Constant	−1.3843*** (0.4131)	−5.4848*** (0.4785)	−5.4643*** (0.4996)	−2.5937*** (0.5938)
McFadden pseudo-R^2	0.0089	0.0492	0.0526	0.1100

Note(s): Entries are survey-probit coefficients with standard errors in parentheses. - Reference categories apply for occupation, macrozone, and gender. - Significance levels: †$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Source(s): Self-made

significant across specifications, suggesting that higher-income households are more likely to hold non-bank credit cards.

Second, education is positive in the education-only model but becomes negative in the multivariate specification. This reversal suggests a suppression effect, potentially reflecting collinearity between education and income. This pattern is consistent with the reviewer's comment and is explored further in the discussion section.

Third, digital financial use and bank account depth emerge as the strongest predictors of adoption. In contrast, traditional financial use is not statistically significant.

These findings suggest that non-bank credit card adoption is more strongly associated with financial engagement than with traditional demographic characteristics. However, these results should be interpreted as associational, given the cross-sectional nature of the data.

4.3 Full specification model

Table 6 presents the full specification model. The results confirm that digital financial use and bank account depth remain strongly associated with non-bank credit card adoption. Income also remains significant, though with a smaller magnitude.

Age and household size are positively associated with adoption, while education becomes statistically insignificant once financial engagement variables are included.

Geographic differences also emerge, with households in the Metropolitan Region less likely to hold non-bank credit cards compared to the reference category.

These findings suggest that financial engagement variables provide stronger explanatory power than traditional demographic factors.

The model achieves a McFadden pseudo-R^2 of 0.1273, indicating moderate explanatory power for cross-sectional household data.

4.4 Robustness checks

Table 7 reports alternative model specifications excluding financial access variables and excluding financial use variables. The results show that digital financial use remains strongly significant when access variables are excluded. Similarly, bank account depth remains significant when financial use variables are excluded.

Table 6. Full specification survey-probit model

Variables	Full specification model
Centered age	0.0056* (0.0027)
Centered age squared	−0.0001 (0.0001)
Log income	0.1376** (0.0424)
Log education	−0.1643 (0.134)
Digital financial use	0.2840*** (0.0628)
Traditional financial use	−0.0214 (0.0534)
Bank account access	−0.204 (0.2144)
Bank account depth	0.5053*** (0.0704)
Male	−0.0802 (0.064)
Household size	0.0690** (0.0208)
Macrozone: Center	0.1026 (0.0888)
Macrozone: South	−0.0545 (0.1037)
Macrozone: Metropolitan Region	−0.2492** (0.0887)
Occupied	0.0251 (0.1024)
Constant	−2.7880*** (0.6186)
McFadden pseudo-R^2	0.1273

Note(s): Entries are survey-probit coefficients with standard errors in parentheses. - Reference categories apply for occupation, macrozone, and gender. - Significance levels: †$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Source(s): Self-made

Table 7. Robustness checks: Alternative financial inclusion specifications

Variables	No access variables	Access variables only
Centered age	0.0039 (0.0027)	0.0038 (0.0026)
Centered age squared	−0.0001 (0.0001)	−0.0001 (0.0001)
Log income	0.2019*** (0.0421)	0.1926*** (0.0451)
Log education	−0.1115 (0.1385)	−0.0564 (0.1429)
Digital financial use	0.3624*** (0.0568)	–
Traditional financial use	0.0015 (0.0516)	–
Bank account access	–	0.1479 (0.1888)
Bank account depth	–	0.6129*** (0.0664)
Male	−0.0909 (0.0651)	−0.0622 (0.0638)
Household size	0.0614** (0.0212)	0.0774*** (0.0204)
Macrozone: Center	0.1031 (0.0885)	0.1009 (0.0872)
Macrozone: South	−0.0859 (0.102)	−0.0488 (0.103)
Macrozone: Metropolitan Region	−0.2491** (0.0862)	−0.2740** (0.0878)
Occupied	0.0213 (0.1053)	0.0145 (0.1015)
Constant	−3.2920*** (0.5937)	−4.3364*** (0.5929)
McFadden pseudo-R^2	0.106	0.1124

Note(s): Entries are survey-probit coefficients with bootstrap replicate weights; standard errors are reported in parentheses. - The first specification excludes bank account access and bank account depth, while the second excludes the financial use indices and includes only financial access measures. This comparison helps disentangle the relative contribution of financial use and financial access to non-bank credit card holding. - Significance levels: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Source(s): Self-made

These findings suggest that both financial access and financial use independently contribute to explaining non-bank credit card adoption. The consistency across specifications supports the stability of the main findings.

4.5 Joint significance tests

Table 8 reports Wald tests evaluating the joint significance of variable blocks. The results indicate that financial access and financial use variables are jointly significant at the 1% level. Sociodemographic variables are also jointly significant, though with smaller contribution.

These findings reinforce the importance of financial engagement variables in explaining non-bank credit card adoption. However, these tests do not imply causal relationships and should be interpreted as evidence of statistical association.

5. Discussion

This section discusses the main findings of the study in light of the theoretical framework and prior literature. The results indicate that financial ecosystem engagement plays a more

Table 8. Joint significance of explanatory variable blocks (Wald tests)

Variable block	F-statistic	df	*p*-value
Financial access	26.39	(2, 185)	<0.001
Financial use	18.68	(2, 185)	<0.001
Sociodemographic	5.75	(6, 185)	<0.001

Note(s): Wald tests are based on the full specification survey-probit model using replicate weights. - Financial access includes bank account access and bank account depth. - Financial use includes digital and traditional financial use indices. - Sociodemographic variables include gender, household size, macrozone, and occupation

Source(s): Self-made

important role than traditional demographic factors in explaining non-bank credit card adoption. To synthesize the empirical evidence, Table 9 summarizes the relative contribution of the main explanatory dimensions.

5.1 Financial ecosystem engagement and non-bank credit card adoption

The results indicate that financial ecosystem engagement, particularly digital financial use and financial depth, is more strongly associated with non-bank credit card adoption than traditional demographic characteristics. This finding is consistent across sequential models, full specification models, and robustness checks, suggesting that non-bank credit cards tend to be adopted by households already integrated into the formal financial system.

This evidence aligns with the theoretical framework presented in Section 2, which conceptualizes non-bank credit cards as retail-embedded financial products designed to complement existing customer relationships and consumption ecosystems rather than serve as primary access instruments (Azevedo *et al.*, 2018; Patalano and Roulet, 2020; Boot, 2000). As vdiscussed in the theoretical framework, retailers use credit products strategically to increase customer loyalty, stimulate consumption, and expand commercial engagement, suggesting that adoption is more likely among financially active households.

Furthermore, the findings are consistent with household finance theory, which suggests that individuals expand their portfolio of financial products as financial sophistication and market participation increase (Guiso and Sodini, 2013; Campbell, 2006). The positive association between financial depth and non-bank credit card adoption supports the credit portfolio expansion hypothesis proposed in the theoretical framework. In particular, prior research suggests that households frequently hold multiple credit products, including both bank-issued and retailer-issued cards (Choi and DeVaney, 1995), reinforcing the idea that non-bank credit cards operate as complementary financial tools.

These findings also support the broader financial intermediation perspective, which emphasizes that credit products increasingly emerge within platform-based financial ecosystems (Vives, 2016; Boot, 2000). In this context, non-bank credit cards appear to function as additional services offered to customers already engaged with financial and retail platforms.

5.2 The role of digital financial engagement

Digital financial use emerges as one of the strongest predictors of non-bank credit card adoption. This finding supports the theoretical arguments, which suggests that digital engagement reduces transaction costs, increases exposure to credit products, and facilitates adoption of new financial services (Vives, 2016; Venkatesh *et al.*, 2003; Davis, 1989). This finding is consistent with evidence suggesting that digital financial literacy enhances individuals' ability to use credit instruments more purposefully, influencing both the type and intensity of credit usage (Jiang *et al.*, 2026).

Table 9. Relative contribution of financial inclusion dimensions

Dimension	Individual significance	Joint significance (wald)	Contribution
Financial access	Mixed (depth significant)	*** ($p < 0.001$)	High
Financial use	Digital significant	*** ($p < 0.001$)	High
Sociodemographic	Partial significance	*** ($p < 0.001$)	Moderate

Note(s): Contribution is assessed based on coefficient significance, Wald tests, and model fit comparisons. - Financial depth and digital use emerge as the most relevant drivers of non-bank credit card adoption

Source(s): Self-made

Digital financial engagement may also reflect increased participation in digital retail ecosystems, where embedded credit solutions such as buy-now-pay-later services and retailer financing options are commonly offered (Ah Fook and McNeill, 2020). These findings reinforce the theoretical argument that digital ecosystems create opportunities for cross-selling credit products within integrated commercial platforms.

Moreover, the results support fintech adoption models, which emphasize that familiarity with digital payment systems increases the likelihood of adopting additional financial innovations. This interpretation aligns with the theoretical framework, which highlights digital financial engagement as a key mechanism driving non-bank credit card adoption.

5.3 Financial depth and portfolio expansion

Financial depth also emerges as a strong predictor of non-bank credit card adoption. This finding directly supports Hypothesis 1, which predicted a positive association between financial depth and adoption.

As discussed in the theoretical framework, financial depth reflects greater familiarity with financial instruments, lower informational barriers, and increased exposure to credit opportunities (Madeira, 2021; Allen *et al.*, 2016). The empirical results confirm that households holding multiple bank accounts are significantly more likely to hold non-bank credit cards, suggesting that adoption occurs as part of broader financial portfolio expansion.

This interpretation is consistent with household portfolio theory, which predicts diversification of financial products as financial sophistication increases (Guiso and Sodini, 2013; Campbell, 2006). Additionally, prior retail credit research suggests that financially engaged households are more likely to adopt retailer-based credit products (Ho *et al.*, 2021), further supporting the theoretical expectations.

Importantly, the results indicate that financial depth matters more than simple financial access, reinforcing the theoretical distinction between financial access and financial engagement introduced in the conceptual framework. Prior research shows that financial outcomes are more strongly associated with credit behavior and financial engagement than with mere access to financial services (Hernandez-Zuluaga *et al.*, 2025).

This distinction highlights an important conceptual implication: financial inclusion should not be understood solely in terms of access to financial products, but rather in terms of the depth and intensity of financial engagement. While access reflects the ability to enter the formal financial system, depth captures the extent to which households actively use and integrate financial instruments into their daily economic behavior.

The empirical results show that simple access to a bank account does not significantly predict non-bank credit card adoption, whereas financial depth exhibits a strong and consistent association. This suggests that credit adoption is driven not by initial inclusion into the financial system, but by subsequent engagement and familiarity with financial products. In this sense, non-bank credit cards appear to function as complementary tools within an already developed financial portfolio rather than as entry-level instruments of inclusion.

5.4 Education reversal and suppression effects

One of the most analytically interesting findings is the reversal of the education coefficient. Education appears positive in bivariate comparisons but becomes negative or insignificant in multivariate models once income and financial engagement variables are included.

This result is consistent with the theoretical framework, which suggested that education may influence credit product substitution rather than overall credit adoption. More educated households may prefer bank-issued credit cards over retailer-based credit instruments, consistent with financial sophistication theory (Guiso and Sodini, 2013; Choi and DeVaney, 1995).

Additionally, this reversal may reflect multicollinearity between education, income, and financial engagement, as more educated individuals typically exhibit higher income and

greater financial participation. This interpretation reinforces the importance of behavioral financial engagement variables over traditional demographic predictors.

5.5 Sociodemographic factors and lifecycle effects

Sociodemographic variables show more limited explanatory power compared to financial engagement variables. Age and household size are positively associated with adoption, consistent with lifecycle theory and consumption smoothing models (Deaton, 1992; Modigliani and Brumberg, 1954).

These findings align with the theoretical framework presented, which suggested that age reflects financial experience and lifecycle effects, while household size influences credit demand through increased consumption needs. However, the magnitude of these effects remains smaller than that of digital engagement and financial depth.

This suggests that traditional demographic segmentation may be less effective for predicting non-bank credit card adoption compared to behavioral financial engagement variables.

5.6 Implications for financial inclusion and credit markets

The findings also contribute to financial inclusion debates. Although non-bank credit cards are often viewed as tools for expanding financial access, the results suggest that adoption is concentrated among households already integrated into the financial system. However, increased credit adoption may also entail important risks related to household over-indebtedness and financial fragility. Prior research indicates that certain consumption patterns, particularly those associated with discretionary spending, may signal higher financial vulnerability and potential repayment difficulties (Bakhtiari *et al.*, 2026).

This finding is consistent with the theoretical framework, which conceptualizes non-bank credit cards as complementary financial instruments embedded within retail ecosystems rather than entry-level financial inclusion tools (Murinde *et al.*, 2022; Boot, 2000).

These results suggest that financial inclusion strategies may need to focus on digital engagement and financial participation rather than simply expanding credit product availability. However, these findings should be interpreted with caution. While increased credit adoption may reflect deeper financial integration, it may also raise concerns regarding household over-indebtedness and financial vulnerability. In particular, the expansion of retail-based credit in emerging markets has been associated with increased exposure to consumption-driven debt, especially when credit is used to finance discretionary expenditures.

Therefore, policies and strategies aimed at expanding credit access should be complemented with measures that promote responsible credit usage and financial literacy to mitigate potential risks associated with over-indebtedness.

5.7 Managerial implications

The findings suggest that segmentation strategies based on financial engagement and digital behavior may be more effective than traditional demographic targeting. Retailers and non-bank financial institutions may benefit from identifying customers with high levels of digital financial engagement and financial depth. In particular, the results indicate that behaviors such as frequent debit card use, digital transactions, and bank transfers are strongly associated with non-bank credit card adoption. These indicators can serve as actionable segmentation variables for targeting potential customers.

Rather than relying primarily on traditional demographic characteristics, firms can leverage transactional and behavioral data to identify financially active individuals who are more likely to adopt complementary credit products. Additionally, the results highlight the growing importance of digital channels and integrated customer ecosystems in credit markets.

Firms may benefit from investing in digital platforms and seamless payment ecosystems to facilitate credit adoption.

5.8 Limitations and future research

This study has several limitations. First, the cross-sectional design prevents causal inference. Second, the dataset does not include information on credit limits, debt levels, repayment behavior, or financial stress. Third, the analysis focuses on adoption rather than credit usage intensity.

Future research could examine longitudinal adoption patterns, credit outcomes, and welfare implications. Comparative studies across Latin American countries may also provide insights into institutional differences in retail credit markets.

6. Conclusions

This study examines the determinants of non-bank credit card adoption using nationally representative household data from Chile. The results show that financial ecosystem engagement, particularly digital financial use and financial depth, is more strongly associated with non-bank credit card adoption than traditional demographic characteristics.

First, financial depth emerges as a key predictor of adoption. Households holding multiple bank accounts are significantly more likely to hold non-bank credit cards, suggesting that these products function as complementary financial instruments within broader household credit portfolios, rather than as entry-level credit tools. This finding aligns with household finance literature emphasizing portfolio expansion and financial sophistication.

Second, digital financial engagement is strongly associated with adoption. Households actively using digital payment instruments and electronic financial services show a higher probability of holding non-bank credit cards. This result supports recent research suggesting that digital ecosystems facilitate access to credit products and reshape consumer financial behavior.

Third, sociodemographic variables show more limited explanatory power. While income, age, and household size remain partially significant, their contribution is smaller compared to financial engagement variables. These findings suggest that financial behavior may be more informative than demographic characteristics in explaining non-bank credit card adoption.

By integrating perspectives from financial behavior, digital finance, and financial literacy, this study provides a more comprehensive understanding of how households engage with credit instruments in emerging economies.

These findings highlight the need to rethink financial inclusion policies by shifting the focus from access expansion toward fostering meaningful financial engagement and responsible credit use. From a managerial perspective, the findings highlight the importance of digital engagement and financial participation for customer segmentation and credit strategy design.

This study is subject to limitations, including the cross-sectional nature of the data and the absence of information on credit usage, debt levels, and repayment behavior. Future research could examine credit outcomes, longitudinal adoption patterns, and cross-country comparisons.

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Appendix 1

Table A1. Factorability diagnostics

Test	Value
KMO	0.76
Bartlett χ^2	396318.60
df	15
p-value	<0.001

Source(s): Self-made

Appendix 2

Table A2. Distribution of bank account access

Category	Frequency	Percentage (%)
No account	7,316	5.08
At least one account	136,803	94.92

Source(s): Self-made

Appendix 3

Table A3. Distribution of bank account depth

Number of accounts	Frequency	Percentage (%)
0	7,316	5.08
1	72,850	50.55
2	63,953	44.38

Source(s): Self-made

Appendix 4

Table A4. Variable screening

Variable	Reason for exclusion
Cash use	No meaningful loading
Prepaid use	No meaningful loading

Source(s): Self-made

Appendix 5

Table A5. Explained variance

Factor	SS loadings	Variance (%)	Cumulative (%)
Traditional use	1.908	31.8	31.8
Digital use	1.736	28.9	60.7

Source(s): Self-made

Appendix 6

Table A6. Correlation matrix of extracted factors

Factor	Traditional financial use	Digital financial use
Traditional financial use	1	0.591
Digital financial use	0.591	1

Source(s): Self-made

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