



Research article

Determinants and evolution of financial inclusion in Latin America: A demand side analysis

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Abstract: The benefits of financial inclusion could be particularly important in Latin America, where the levels of ownership and use of different instruments lag behind those of developed countries. An improvement in the ownership and use of formal financial instruments could result in a reduction in informality, the promotion of formal savings and productive credit, and, therefore, an inclusive economic growth. The objective of this paper is to analyze the financial inclusion of a group of Latin American countries in order to detect the most used financial instruments and the main socioeconomic determinants that explain their ownership or use. At the same time, the evolution of the main variables was also studied for the years 2011, 2014, 2017 and 2021. Micro-data from the Global Findex database was examined (except for 2021, in which only macro-data are available). Statistical models and multivariate econometrics are applied to understand the individual socioeconomic characteristics of people who are still very unlikely to own and use formal financial instruments. Finally, the main reasons for not having an account were analyzed in order to delve into the main restrictions on which the financial market must focus to achieve greater financial inclusion.

Keywords: financial inclusion; Latin America; demand side

JEL Codes: G21, F24, R20, C31, C34

1. Introduction

As defined by the World Bank¹, “financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs—transactions, payments, savings, credit and insurance—delivered in a responsible and sustainable way”.

An inclusive financial system is an important tool for economic and social development. Hence, financial inclusion continues to be a topic of great interest for the design of public policies, especially in developing countries. This interest arises from the evidence on the channels through which financial inclusion promotes savings, investment and productive development and allows households to smooth consumption, face unexpected health problems or unemployment, or invest in education or housing (Orazi et al., 2020; Sharma, 2016; Demirgüç-Kunt and Klapper, 2012; Collins et al., 2009; Burgess and Pande, 2005).

Greater financial inclusion implies a reduction in financial costs in terms of time and security of daily operations. Moreover, it represents a better channeling of savings toward increased investment, output and employment (Liao et al., 2022; Goel and Sharma, 2017; Cull et al., 2014), especially for the population with fewer resources and less education, together with the youth, who are particularly excluded from the formal financial system (Naz et al., 2020; Orazi et al., 2019; Demirguc-Kunt et al., 2017; Allen et al., 2016). In other words, financial inclusion generates a path for economic growth, especially focused on the low-income population, since access to and use of financial tools improves the management of household risks, income, expenses and investments. For these reasons, financial inclusion has gained importance on the agenda of various international institutions, such as the United Nations Organization, the World Bank and the Development Bank of Latin America or the Andean Development Commission (CAF, as per its initials in Spanish). These entities have financed projects and research, highlighting the relevance of promoting financial inclusion worldwide in order to reduce poverty, improve income distribution and encourage economic development.

Under those premises, it is worth obtaining a thorough overview of the progress of financial inclusion in Latin American countries in terms of the evolution in the ownership and use of the main financial instruments, the access gaps that exist among the population and the obstacles that limit market growth.

The relevance of this work is related to the scarce studies on this topic in Latin America, especially those using an updated international survey concerning the demand side. The countries of this region present distinctive characteristics (e.g., large informal markets and difficulties to generate sustained economic development). Therefore, it is of utmost importance to examine them in detail. There is ample evidence that emerging nations have the potential to boost economic growth through formal financial inclusion policies, that also reduce poverty and inequality. In this line, this paper is a

¹Web page: <https://www.worldbank.org/en/topic/financialinclusion/overview>.

unique contribution to the literature review on financial inclusion, as it applies the best methodology based on the characteristics of the available data.

As proxies for financial inclusion, the instruments analyzed in this article include i) having an account at a financial institution, ii) having saved or taken credit at a financial institution in the last 12 months, iii) owning debit and credit cards and iv) having a mobile account or used an online payment system in the last year. The study considered individuals from seven Latin American countries (Argentina, Brazil, Chile, Colombia, Peru, Uruguay and Venezuela). These nations have been selected for their similarities in size and level of economic activity in the region, akin to those used in works such as Martínez et al. (2022), Martínez et al. (2020), Martínez Pería (2013) and Roa (2013).

The paper is structured as follows. Section 2 offers a literature review on financial inclusion and focuses on the Latin America region. Then, Section 3 presents the data and methodology used with all of the details of the analysis carried out. Section 4 provides a discussion of the results. Next, the obstacles to financial inclusion are described in Section 5. Finally, the last section synthesizes the main results of the paper and includes the conclusions.

2. Literature review

The importance of financial inclusion emerged as the next analytical step after the extensive set of evidences from numerous studies in the 1990s, demonstrating the significance of financial development for economies, promoting industrial and business expansion and improving productivity and capital accumulation (Jauch and Watzka, 2016; Samargandi et al., 2015; Beck et al., 2007; Levine, 2005). In this way, financial inclusion can be understood as a relevant aspect of the financial development of a country through the creation of formal, sustainable and inclusive financial institutions, which channel savings, investment, and, therefore, economic growth, especially in developing nations (Barajas et al., 2020; Qamruzzaman and Wei, 2019; Cull et al., 2014; Kochar, 2011; Hulme and Mosley, 2006).

In particular, Demircuc-Kunt et al. (2017) analyzed the empirical evidence on the use of financial services and their contribution to inclusive growth and economic development in several countries around the world. They found that financial inclusion increases formal savings, promotes investment and the expansion of the domestic market, and, consequently, favors economic growth. Likewise, for India, Sharma (2016) identified a positive and bidirectional association between economic growth and various dimensions of financial inclusion, such as the geographic scope and diversity of financial services and their use, especially deposits in savings accounts. Moreover, Burgess and Pande (2005) showed that a rural banking expansion program in the above-mentioned country, between 1977 and 1990, reduced poverty and increased non-agricultural production, which is an effect that was accentuated in sectors with fewer financial services prior to this program. Among the financial tools that were most significant to achieve this end were transfers and access to credit.

Park and Mercado (2015) studied the impact of financial inclusion on poverty and income inequality in Asian countries. The results show that higher per capita income, stronger state regulations, compliance with financial contracts and a larger demographic space are significantly related to the level of financial inclusion in this region. In addition, the authors found that financial inclusion explains the lower poverty and income inequality in these countries. Cicchiello et al. (2021) investigated the relationship between the

financial inclusion index and development variables for emerging countries in Asia and Africa during the years of 2000 to 2019 and found that economic growth leads to financial inclusion, similar to literacy rates and unemployment, but in opposite direction.

Allen et al. (2016) analyzed key variables for financial inclusion in 123 countries around the world. At the macroeconomic level, the authors observed that nations with a higher proportion of the population included in the financial system presented lower financial costs, stronger legal rights (in terms of consumer guarantee protection and bank failure laws) and more stable political environments. In turn, Sahay et al. (2015) carried out a study for 88 countries to verify whether financial inclusion has a positive impact on economic growth, controlling for factors such as initial gross domestic product per capita, education or the existence of systemic banking crises. The authors identified that this effect is significant when the level of development or financial depth is included in the model, since, at a higher level of development of the economy, the marginal effect of increasing financial inclusion on growth declines.

Han and Melecky (2013) determined that, in times of global financial crises, in economies with a higher degree of financial inclusion, the risk of a systemic crisis within the financial system is lower. The authors explained that the diversification of deposits in various agents made total deposits more stable, allowing a better recovery of credit, investment and economic activity. In this way, promoting the creation of inclusive and safe institutions that provide an efficient and timely service to excluded population groups allows considering financial inclusion as a source of economic stability as well.

Based on a sample of Latin American countries, Roa (2013) highlighted that recognition of the importance of policies on financial inclusion has gained momentum since the 1990s. This is due to three dimensions: the growing evidence of a positive relationship between economic development and financial inclusion, the concern for financial stability and the presence of a market niche not yet considered by traditional banking, as supplied by an informal market, and without regulation.

Bruhn and Love (2013) studied the effects of financial inclusion in regions of Mexico lacking financial services, trying to achieve an approximation to a natural experiment. The authors found that the expansion of financial institutions that focused on the population excluded from the financial system, with medium and low income, had a positive impact on access to the labor market, the development of entrepreneurship and the increase in income. In turn, they observed a growth in gross domestic product per capita in those regions where there was less provision of services before the experiment.

As important as financial inclusion is for macroeconomics, households and small businesses, access to a financial account is a key element, too. It makes daily activities easier and safer and improves the ability to plan the future and face short-term shocks. The recent mobile expansion phenomena provided the market with a new opportunity for financial inclusion. It has shown positive effects on development by increasing financial access points, broadening the scope of financial service applications, and reaching more territory (Kim et al., 2018).

Low-income families have a very diverse economic administration since they must face daily financial adversities with scarce and unstable income and assume all kinds of risks ranging from insecurity to health problems. The analysis of the financial “diaries” of the poorest families, detailed in the book by Collins et al. (2009), documents the complexity of daily financial activities and the large unsatisfied demand for small-scale services for the savings, consumption, housing or investment of poor households and small businesses.

Bearing these difficulties in mind, several authors have studied the determinants of financial exclusion at the microeconomic level, i.e., which particular characteristics of the population most strongly influence the probability of not having or using financial services in different regions of the world. Zins and Weill (2016) considered various indicators of access and use of financial services for certain African countries and found that the population groups least likely to be included in the financial system are women, the youth and the population with lower income and education. In turn, Fungáčová and Weill (2015) also identified similar profiles of the population that are excluded from the financial system for the group of countries called BRICS (Brazil, Russia, India, China and South Africa) that have a large territory and population, although with different levels of development, and verified that the result is consistent. Orazi et al. (2021) conducted a study by household in the Argentine population during 2015 to detect the variables that affect financial inclusion. They observed that employment formality, income level and education of the main breadwinner are significant variables and increase the probability of financial inclusion.

Similarly, Martinez et al. (2020, 2022) analyzed the evolution of financial inclusion and its main determinants in seven Latin American countries for the 2011 and 2014 Global Findex dataset, evaluating formal financial accounts, formal savings and formal credit as proxies of financial inclusion. The authors found that age, level of education and income positively affect financial inclusion in these nations. Girón et al. (2021) examined financial inclusion in a set of countries in Asia and Africa and identified that young people and women are the groups most excluded from the financial system, and that education and income are two of the key aspects to increase financial inclusion.

Recently, there has been a growing interest in investigating the presence of gender inequality in financial inclusion. For example, Kazemikhasragh et al. (2022) found that women in the Middle East and North Africa were less likely to have an account at a financial institution or through a mobile money provider to save formally at a financial institution, and to take loans, regardless of purpose. However, being a woman increases the probability of saving semi-formally by means of a savings club or someone outside the family. This is in line with the study by Cicchiello (2021), who also found this gender gap with the exception of credit card ownership. These authors highlighted the importance of public policies to promote financial inclusion of women and remove the barriers they face in accessing and using financial services.

Based on this evidence, this paper sought to obtain a thorough overview of the progress of financial inclusion in Latin American countries up to 2021, the last year of data availability. This is in terms of the evolution in the possession and use of the main formal financial instruments, including account ownership, formal savings and credit instruments, and debit and credit cards. An analysis is provided on the differences in access that exist among the population, which reinforce the mechanisms of inequality and limit economic development.

3. Data and methods

The database used is the Global Findex of the World Bank, corresponding to the years of 2011, 2014 and 2017. Recent macro-data for the year 2021 has been included; nonetheless, given the lack of micro-data, this last measure was not considered in the multivariate models. This database

contains information on 1000 individuals per country. The survey was conducted on a civilian, non-institutionalized population aged 15 or older.

The Global Findex database contains a large number of financial inclusion indicators that allow evaluation of the possession and use of formal financial services, as well as provide information corresponding to the characteristics of the respondents (gender, age, level of income and education) to characterize the population under study.

This section focuses on the analysis of the variables most used in the literature, particularly, proxies of financial inclusion, since they refer to access to services in a formal financial institution. They are detailed below:

- *Financial Accounts* includes those individuals who reported having an account (by themselves or with another person) at a bank or other type of financial institution, or those who have personally used a mobile money service in the last 12 months.
- *Formal Savings* considers those respondents who reported having saved or kept money in a bank or other type of financial institution in the last 12 months.
- *Formal Credit* includes individuals who borrowed money from a bank or other type of financial institution in the last 12 months.
- *Debit Cards* correspond to respondents who reported having a debit card.
- *Credit Cards* consider those people who reported having a credit card.
- *Mobile Accounts* is the percentage of respondents who reported having personally used a mobile money service in the past 12 months.
- *Online Payments* represents the percentage of individuals who reported using the internet to pay bills or to buy something online in the past year.

All of the variables are binary categorical, being equal to one if the person answered “yes” to having or using the mentioned instruments, and zero if they answered “no”.

The work methodology is based on using mean differences to detect whether the proportions of the population with possession and use of the instruments are the same or different in each of the years of the study. In this way, it could be contrasted, with some statistical confidence, if there were improvements in the financial inclusion of the countries.

Probit regressions were performed to identify the determinants of possession and use of said instruments, considering the socioeconomic characteristics of the study population. The descriptive statistics of the proxy dependent variables of financial inclusion are detailed in the next section, together with the mean difference tests. Table 1 summarizes the descriptive statistics of the independent variables for the countries in the sample.

Table 1. Descriptive statistics of the independent variables.

Variable	2011		2014		2017	
	Mean	SD	Mean	SD	Mean	SD
Gender	62%	0.486	60%	0.489	61%	0.489
Age	44	18.74	45	18.55	44	18.64
Educ, Primary	33%	0.470	33%	0.471	32%	0.466
Educ, Secondary	57%	0.495	57%	0.495	58%	0.494
Educ, Higher	9%	0.290	9%	0.292	10%	0.300
First_Q_Income	16%	0.367	17%	0.371	18%	0.383
Sec_Q_Income	17%	0.376	18%	0.383	18%	0.386
Third_Q_Income	20%	0.402	20%	0.398	20%	0.397
Fourth_Q_Income	21%	0.405	21%	0.405	22%	0.411
Fifth_Q_Income	26%	0.439	25%	0.434	23%	0.420
Observations	7051		7039		7040	

Note: Own elaboration considering the Global Findex database for the year analyzed. Similar results were obtain for each country under study.

The first variable considered was *Gender*, a dummy variable that takes the value of 1 if the person responding to the survey is a woman, and 0 otherwise. About 60% of the individuals surveyed each year are women. The variable *Age* captures the age of all respondents, between 15 and 99 years old, presenting an average of 45 years, which was similar for the three years. This variable was also used as squared Age to capture a possible non-linear relationship between age and financial inclusion. Then, the variable *Education* was considered, which is a categorical variable divided into three categories, according to the levels of studies completed: primary (Educ. Primary—base category), secondary (Educ. Secondary) or higher (Educ. Higher) education. The distribution of the educational level of the sample for the three years is similar: 33% of the participants have completed the primary level, 57% reached the secondary one and 9% had a higher education. Similarly, the *Income* variable was taken into account. It was divided into quintiles, which includes the poorest 20% of the population (First_Q_Income—first quintile), the second poorest quintile of the population (Sec_Q_Income—second quintile), the population from the middle quintile (Third_Q_Income—third quintile), the fourth income quintile (Fourth_Q_Income—fourth quintile) and the richest quintile of the population (Fifth_Q_Income—fifth or richest quintile). The distribution of individuals among the income quintiles is homogeneous: around 20% for each income quintile for each year of study.

In turn, the variables of residence of each country were included as dummies to compare the samples since they belong to different nations, with Argentina being the base category country. The number of data collected was similar for all countries and the three years of study, i.e., around a thousand responses per country per year.

In order to identify the main variables that affect the ownership of the five selected financial instruments, probit models (Long and Freese, 2001) were applied given the binary nature of the dependent variables.

The probit model was estimated by defining a latent variable y^* , which is linearly related to the explanatory variables, plus a residual μ , through the following model:

$$y_i = \beta_i x_i + \mu \quad (1)$$

y_i^* is a latent variable that is related to the observed variable y_i , in the following way:

$$y_i \begin{cases} 1 & \text{if } y_i > 0 \\ 0 & \text{if } y_i \leq 0 \end{cases} \quad (2)$$

Therefore, the probability that the event will occur was defined as the equation below:

$$Pr(y_i = 1/x_i) = Pr(y_i = 0/x_i) \quad (3)$$

Substituting with Equation (1) and rearranging the terms, we obtained

$$\begin{aligned} Pr(y_i = 1/x_i) &= Pr(\mu > (-\beta_i x_i)/x_i) \\ &= F(x_i \beta_i) \end{aligned} \quad (4)$$

where $F(\cdot)$ is the normal cumulative distribution function. In these models, the estimate is made by maximum likelihood, because the distribution of the data was defined by the Bernoulli model. For the estimations, Stata (v. 14) was used.

So, the probability that the individual has the different instruments under analysis was modeled based on the following expression:

$$\begin{aligned} Pr(y_i = 1/x_i) &= Pr(\alpha + \beta_1 \text{Gender} + \beta_2 \text{Age} + \beta_3 \text{Age}^2 + \beta_4 \text{Educ.Secondary} + \\ &\beta_5 \text{Educ.Higher} + \beta_6 \text{Sec_Q} + \beta_7 \text{Third_Q} + \beta_8 \text{Fourth_Q} + \beta_9 \text{Fifth_Q} + \beta_{10} \text{Brazil} + \\ &\beta_{11} \text{Chile} + \beta_{12} \text{Colombia} + \beta_{13} \text{Peru} + \beta_{14} \text{Uruguay} + \beta_{15} \text{Venezuela} + \epsilon \end{aligned} \quad (5)$$

where Y corresponds to different variables of holding financial instruments, of which Financial Accounts (1), Formal Savings (2), Formal Credit (3), Debit Cards (4) and Credit Cards (5) are considered. In turn, the consistency and goodness-of-fit values of the models, the pseudo R^2 and the Wald and LR tests are estimated and detailed in the next section.

4. Results and discussion

The first analysis carried out was the difference in means, under the null hypothesis that the proportions were the same for the three years of study. This is against the alternative hypothesis that there was a change (positive or negative) in terms of the number of individuals who had or used the instruments evaluated as an operational measure of the country's financial inclusion.

Table 2 highlights the means and standard deviation of each year for each country. In addition, it details the significance of the Chi2 test to identify the level of error with which the null hypothesis is rejected, that is, if there was an evolution in the ownership and use of the instruments between 2011 and 2014 (on the 2014 row), and between 2014 and 2017 (on the 2017 row). In turn, the table shows the percentage of possession and use of the instruments of the survey carried out in 2021, of which the frequencies can be consulted, but the micro-data are not yet available (that is why there is no data on the standard deviation or the Chi2 test for 2021).

Table 2. Descriptive statistics and p-value of mean difference.

Country /year	Financial Accounts Average (SD)	Formal Savings Average (SD)	Formal Credit Average (SD)	Debit Cards Average (SD)	Credit Cards Average (SD)	Mobile Accounts Average (SD)	Online Payments Average (SD)
Argentina							
2011	40% (0.490)	5% (0.224)	7% (0.257)	36% (0.481)	27% (0.446)		
2014	55% (0.498)	*** 5% (0.216)	9% (0.289)	* 50% (0.500)	*** 30% (0.458)	0.2% (0.044)	8% (0.271)
2017	53% (0.500)	8% (0.265)	** 7% (0.260)	46% (0.499)	26% (0.441)	* 2.5% (0.156)	*** 18% (0.271)
2021	71%	11%	11%	55%	29%	35%	33%
Brazil							
2011	57% (0.495)	10% (0.301)	7% (0.252)	42% (0.493)	28% (0.451)		
2014	70% (0.458)	*** 12% (0.321)	12% (0.326)	*** 60% (0.490)	*** 31% (0.465)	0.5% (0.076)	8% (0.271)
2017	71% (0.455)	12% (0.329)	9% (0.281)	*** 59% (0.491)	25% (0.434)	** 4% (0.186)	*** 14% (0.342)
2021	84%	23%	19%	66%	40%	27%	42%
Chile							
2011	45% (0.498)	14% (0.351)	9% (0.282)	28% (0.450)	26% (0.437)		
2014	61% (0.487)	*** 16% (0.368)	16% (0.362)	*** 51% (0.500)	*** 29% (0.454)	* 4% (0.188)	14% (0.376)
2017	68% (0.465)	*** 19% (0.390)	11% (0.310)	*** 53% (0.499)	28% (0.449)	*** 13% (0.338)	*** 22% (0.417)
2021	87%	31%	8%	79%	24%	S/d	56%
Colombia							
2011	31% (0.463)	10% (0.297)	12% (0.326)	22% (0.416)	10% (0.304)		
2014	38% (0.486)	*** 11% (0.317)	16% (0.362)	** 29% (0.454)	*** 13% (0.332)	2% (0.149)	5.2% (0.233)
2017	43% (0.495)	** 8% (0.278)	** 14% (0.344)	23% (0.420)	*** 13% (0.335)	4% (0.200)	** 9.7% (0.296)
2021	60%	11%	16%	29%	13%	22%	20%

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Country /year	Financial Accounts Average (SD)	Formal Savings Average (SD)	Formal Credit Average (SD)	Debit Cards Average (SD)	Credit Cards Average (SD)	Mobile Accounts Average (SD)	Online Payments Average (SD)
Peru							
2011	25% (0.431)	10% (0.303)	15% (0.361)	17% (0.377)	11% (0.316)		
2014	31% *** (0.463)	13% * (0.335)	13% * (0.334)	25% *** (0.431)	12% (0.329)	0%	3% (0.179)
2017	43% *** (0.496)	9% *** (0.283)	15% (0.360)	28% * (0.449)	12% (0.325)	3% *** (0.170)	7% *** (0.263)
2021	57%	15%	16%	36%	13%	14%	20%
Uruguay							
2011	30% (0.461)	8% (0.269)	15% (0.361)	21% (0.409)	31% (0.463)		
2014	47% *** (0.499)	13% *** (0.334)	23% *** (0.417)	39% *** (0.488)	42% *** (0.493)	1% (0.104)	12% (0.326)
2017	60% *** (0.489)	11% (0.311)	17% *** (0.378)	54% *** (0.498)	40% (0.490)	s/d	27% *** (0.444)
2021	74%	15%	19%	66%	36%	s/d	34%
Venezuela							
2011	43% (0.495)	13% (0.337)	2% (0.133)	30% (0.461)	8% (0.274)		
2014	57% *** (0.494)	20% *** (0.403)	2% (0.140)	50% *** (0.500)	19% *** (0.393)	2% (0.143)	8% (0.304)
2017	76% *** (0.427)	20% (0.400)	7% *** (0.260)	68% *** (0.464)	28% *** (0.449)	10% *** (0.296)	29% *** (0.453)
2021	84%	19%	4%	76%	18%	30%	57%

Note: Significance of the Chi2 test: *** 99%, ** 95%, * 90%.

As can be seen, the most widespread instrument is Financial Accounts, which, in 2021, reached 87% of the surveyed population in Chile, i.e., the highest value in the sample, followed by Brazil and Venezuela (84%). Regarding the evolution of the proportion of the population holding financial instruments, the variable Financial Accounts is the most significant in terms of a favorable evolution of its levels for all the countries studied. Mainly, a substantial increase between 2011 and 2014 stands out. Only Argentina and Brazil do not present a significant difference between 2014 and 2017, while the rest of the countries in the sample showed a favorable evolution. Since micro-data are not available, it is not possible to confirm the significance of the evolution for 2021. However, the percentage indicates an important impulse.

The variables Formal Savings and Formal Credit register lower levels of use, reaching only 31% of the sample of individuals in Chile who reported having saved in a financial institution in 2021 (the highest value in the sample), and 23% of respondents in Uruguay who requested a loan at a financial institution in 2014. However, for 2017, the levels decreased. On the other hand, for 2021, most of the

countries increased the percentages that had reduced in 2017, except in Chile and Venezuela, where the levels resulted lower in 2021.

In relation to Debit Cards, between 2011 and 2014, there was a significant increase in their number in all countries, while, for 2017, in general, the proportion was maintained, or the differences were not significant. However, in Peru, Uruguay and Venezuela, this percentage continued to increase significantly. Colombia was the only country where the level of debit card ownership fell substantially in 2017. For 2021, despite not being able to contrast the evolution in statistical terms, a great boost was observed in their possession in all countries. Yet, Chile stands out, reaching 79% of the respondents who indicated having a debit card, similar to the Financial Accounts analysis.

For Credit Cards, there is not a considerable evolution in the years of study. For 2014, the proportions of ownership increased in Chile, Uruguay and Venezuela compared to 2011, but there is no significant difference for 2017. In Argentina and Brazil, a marked drop was observed for 2017. However, Brazil recovered in this indicator, reaching 40% in 2021. Uruguay also had 42% credit card ownership in 2014.

This work included two digital variables due to the momentum they have had in recent years: mobile account ownership and the proportion of individuals who made online payments. Although this information is not available for 2011, the great boom they experienced between 2014, 2017 and 2021 can be observed. In Chile and Venezuela, these variables went from 4% and 2% in 2014 to 13% and 10% in 2017, respectively. In 2021, most of the countries already had more than a third of respondents with these instruments, except for Peru (14%) and Colombia (22%).

Regarding Online Payments, there was also a significant increase in their use between 2014 and 2017. Likewise, for 2021, this variable grew substantially, as reported by the World Bank, reaching 56% and 57% of respondents in Chile and Venezuela, respectively. These countries are followed by Brazil (42%), Uruguay (34%) and Argentina (33%), while Colombia and Peru evidenced lower levels for 2021 (20%), despite the restrictions of mobility and on-site shopping driven by the pandemic.

Based on these results, it is possible to infer that Financial Accounts is the most used instrument in all countries in the sample, together with Debit Cards. They are more feasible to boost through policies aimed at formalizing transfers and operations at no cost, showing more immediate results. On the other hand, the promotion of Formal Savings and financing through credit institutions, together with Credit Cards, are tools that present lower levels of use by individuals in the sample countries. The incentives for using these instruments are more difficult to specify, since they are related not only to the macro- and micro-economic situations of the population, but also to the costs and benefits that these operations imply, and even to the culture, history, practices and customs of each country.

It can also be seen that, in recent years, there has been a boost in online and mobile transactions. While they did not reach 10% in 2014, more than half of the population of Chile and Venezuela reported having made an online payment in 2021.

Table 3. Probit estimation coefficients for the 2017 database.

	Financial Accounts		Formal Savings		Formal Credit		Mobile Accounts		Online Payments	
Gender	-0.027	**	-0.026	***	-0.016	***	-0.008	*	-0.018	**
	(0.0127)		(0.0074)		(0.005)		(0.004)		(0.008)	
Age	0.015	***	0.000		0.007	***	0.003	***	0.005	***
	(0.0017)		(0.001)		(0.0007)		(0.001)		(0.001)	
Age ²	-0.0001	***	0.000		-0.0001	***	0.000	***	0.000	***
	(0.0000)		(0.000)		(0.000)		(0.000)		(0.000)	
Educ. Secondary	0.141	***	0.054	***	0.014	**	0.014	**	0.103	***
	(0.0152)		(0.009)		(0.0058)		(0.006)		(0.010)	
Educ. Higher	0.315	***	0.210	***	0.070	***	0.074	***	0.381	***
	(0.0156)		(0.0232)		(0.0152)		(0.018)		(0.027)	
Sec_Q	0.049	**	0.043	**	0.006		0.023	**	0.064	***
	(0.0195)		(0.0171)		(0.0095)		(0.011)		(0.018)	
Third_Q	0.107	***	0.076	***	0.016		0.020	*	0.141	***
	(0.0185)		(0.0178)		(0.0101)		(0.010)		(0.021)	
Fourth_Q	0.140	***	0.088	***	0.027	**	0.047	***	0.158	***
	(0.0181)		(0.0179)		(0.0106)		(0.013)		(0.021)	
Fifth_Q	0.244	***	0.199	***	0.040	***	0.063	***	0.272	***
	(0.017)		(0.0208)		(0.0114)		(0.014)		(0.023)	
Brazil	0.200	***	0.069	***	0.001		0.017		-0.028	**
	(0.0185)		(0.0187)		(0.0096)		(0.011)		(0.012)	
Chile	0.161	***	0.137	***	0.036	***	0.120	***	0.041	***
	(0.0197)		(0.0214)		(0.0125)		(0.020)		(0.016)	
Colombia	-0.085	***	0.010		0.023	**	0.017		-0.085	***
	(0.0232)		(0.0157)		(0.0115)		(0.011)		(0.009)	
Peru	-0.126	***	-0.003		0.018	*	-0.003		-0.113	***
	(0.0234)		(0.0147)		(0.0111)		(0.009)		(0.007)	
Uruguay	0.074	***	0.025		0.019	*			0.099	***
	(0.0214)		(0.0161)		(0.0113)				(0.019)	
Venezuela	0.212	***	0.129	***	-0.022	***	0.068	***	0.059	***
	(0.0185)		(0.0212)		(0.0072)		(0.016)		(0.017)	
Observations	7035		7035		7035		6037		7035	
Pseudo R ²	0.123		0.1188		0.0652		0.1638		0.2321	
Log lik. full M	-4167.75		-2326.44		-2340.86		-1156.76		-2564.76	
LR test chi2	1027.8	***	588.1	***	255.91	***	307.19	***	1170.48	***
Wald chi2	1024.4	***	563.85	***	300.86	***	276.48	***	1034.56	***

Note: Significance: *** 99%, ** 95%, * 90%. Standard deviation in brackets.

The previous analysis evidences that, although there has been an increase in access to the main financial services, these are still not within the reach of a large proportion of the population. In order to know the determinants by which an individual has greater or lesser probabilities of having and

using the instruments analyzed, Table 3 was constructed to show the estimates of the coefficients of the probit regressions of the instruments and their significance for 2017 data.

The robustness of the different models was examined through the goodness-of-fit statistics. As can be seen, the model with the highest pseudo R^2 was Online Payments, followed by Mobile Accounts. This means that the independent variables explain most of the variance of those instruments. On the other hand, the LR test was used to determine if the full model explains the dependent variables better than the base model including only gender, age and squared age (for non-linear relationship). All full models proved to be significantly more accurate in this regard. The Wald test validated this result by significantly rejecting the null hypothesis that the coefficient is 0 for all models.

Regarding the ownership of Financial Accounts, we can observe the importance of the socioeconomic variables, considering the signs and the significance of the coefficients in the regression. It stands out that a person is more likely to have an account if he is male, if he has reached a higher level of education and if he is in the upper-income quintiles. While the individual's age positively impacts on the account ownership, a non-linear effect is recorded since age squared is also significant, but negative. This implies that this probability increases up to a certain level where it lowers again.

In relation to the country of the individuals in the sample, it can be evidenced that, for 2017, Brazilians, Chileans, Uruguayans or Venezuelans are more likely to have an account. On the other hand, in Colombia or Peru, the probabilities of having an account decrease with respect to Argentina.

As for the variable Formal Savings, it can be seen that the socioeconomic determinants influence the probability of having saved money in a bank or other financial institution in the same way as in the previous case. Being a man, with a higher level of education and income increases the likelihood of using this instrument, while age is not significant for the 2017 sample. Brazil, Chile and Venezuela are more likely to have formal savings than Argentina. Colombia, Peru and Uruguay are not significant variables in this case.

The probability of accessing a Formal Credit in a financial institution in the last year obey to the same determinants as the previous instruments. In turn, it can be seen that these models have lower goodness-of-fit indicators than the previous ones. With the exception of Brazilians (not significant) or Venezuelans (negative relationship), people from the other countries are more likely to have applied for a formal loan compared to Argentines.

The socioeconomic profile of the people who could access mobile accounts and online payments also performed in a similar way to the rest of the instruments. Chileans and Venezuelans show greater probabilities of having a mobile account, while those two populations together with Uruguayans are more likely to use digital payments than Argentines. In the case of Brazil, Colombia and Peru, these probabilities decrease.

Probit regressions of all instruments, including debit and credit card ownership, were performed for the three years of study, and the determinants turned out to be similar to those previously described. They can also be found in Martinez et al. (2020) for 2011 and 2014, maintaining their results for 2017.

In short, it can be seen that the determinants of financial inclusion, in terms of ownership and use of the financial instruments analyzed, share significance and impact over the dependent variable. In most cases, being a man, older (up to a certain level), and with a higher level of education and

income, generates greater probabilities of having and using basic financial services, such as financial accounts, formal savings and credit, or mobile account and online payments.

Comparing the individuals from each country in the sample with Argentines, it was observed that Brazilians had a higher probability of access to financial accounts and formal savings, but were less likely to make digital payments in 2017. For individuals from Chile, there was an improvement in the probabilities of having each of the instruments, as with those from Venezuela (except in terms of formal credit). Uruguayans presents better chances of having accounts, formal credit and online payments.

On the other hand, Colombia and Peru are at a disadvantage compared to Argentina in terms of the use of financial accounts and online payments. However, they present higher probabilities of using formal credit.

The next section includes an analysis of the reasons why people mentioned not having an account. The aim is to delve into in the main restrictions on which the financial market must focus in order to include those people that still struggle with the marginalization in the formal sector of the economy.

5. Obstacles to financial inclusion

Based on the evidence found on the conditions and countries of people with the least probability of having and using formal financial services, the importance of access to a bank account to carry out everyday transactions is highlighted as a first step toward greater financial inclusion. This is explained by the fact that the use of formal account procedures can reduce costs and times in financial transactions, as well as improve the security of such activities.

The Global Findex provides a number of possible reasons why people state that they do not have formal accounts. Table 4 shows the proportion of individuals who mentioned each reason based on the total number of respondents for 2017, the same sample as the previous analysis and the variation in the 2021 survey, to verify if any of these conditions were addressed.

The main reasons why individuals do not have accounts in formal institutions, according to the 2017 survey, are (a) insufficient funds (Argentina, Chile, Colombia, Uruguay, Venezuela) and (b) the cost of financial services (Brazil, Peru). Religious reasons are the least mentioned by people in Latin America. These results help to formulate better policies to promote financial inclusion in Latin America in particular, unlike the countries of the Middle East and North Africa. In these latter regions, religious concerns are among the most relevant barriers to financial inclusion (Cicchello, 2021); hence, policy-makers face a different kind of challenge.

During 2021, Chile was the country that made the most important improvements in this regard, especially by lowering the cost of financial services. In addition, the number of people who did not have funds to use financial services decreased. The percentage of this last reason is the one that was reduced the most for 2021 in Brazil, Colombia, Peru, Uruguay and Venezuela as well. In Argentina, the most important decrease occurred in the lack of necessary documentation, since only a national ID is required to open a bank account.

Table 4. Reasons why people do not own an account in 2017, and the variation change for 2021.

	ARG	BRA	CHL	COL	PER	URY	VEN
<i>Financial institutions are too far away</i>	5%	12%	6%	14%	19%	3%	5%
<i>(% variation 2021)</i>	(+1%)	(-4%)	(-2%)	(+3%)	(+4%)	(+1%)	(-0%)
<i>Financial services are too expensive</i>	23%	22%	22%	41%	37%	15%	7%
<i>(% variation 2021)</i>	(-3%)	(-6%)	(-14%)	(-4%)	(-1%)	(-4%)	(-1%)
<i>Lack of necessary documentation</i>	15%	6%	8%	17%	16%	9%	5%
<i>(% variation 2021)</i>	(-6%)	(-0%)	(-4%)	(+7%)	(+1%)	(-3%)	(+5%)
<i>Lack of trust in financial institutions</i>	15%	9%	17%	19%	25%	9%	6%
<i>(% variation 2021)</i>	(-1%)	(-4%)	(-9%)	(+2%)	(-3%)	(-1%)	(-0%)
<i>Religious reasons</i>	1%	2%	2%	3%	7%	0%	1%
<i>(% variation 2021)</i>	(-1%)	(-0%)	(-1%)	(+3%)	(-1%)	(+1%)	(-0%)
<i>Insufficient funds</i>	32%	21%	23%	45%	29%	32%	16%
<i>(% variation 2021)</i>	(-4%)	(-6%)	(-17%)	(-9%)	(-3%)	(-10%)	(-7%)
<i>Someone in the family has an account</i>	11%	15%	7%	14%	16%	7%	13%
<i>(% variation 2021)</i>	(-2%)	(-4%)	(-3%)	(-0%)	(-1%)	(-0%)	(+1%)
<i>No need for financial services</i>	20%	13%	14%	22%	23%	15%	7%
<i>(% variation 2021)</i>	n/d	n/d	n/d	n/d	n/d	n/d	n/d

Note: Values in bold are the highest percentage in each country.

Compared with the results shown in the previous section, the main reasons why people do not have an account allows understanding of the core dimensions on which each country may have made changes in the last years. The economic situation of the household in Latin America is a determinant, but policies must consider other aspects in order to reduce the cost of financial services, the lack of trust and the unavailability of access points to make the market more inclusive, according to what people indicated in the surveys.

6. Conclusions

In this paper, the Global Findex database was analyzed at the micro-data level, that is, the responses of the individuals consulted and their socioeconomic profile. This work considered the four years in which the survey was carried out: 2011, 2014, 2017 and 2021. This last survey was recently presented at an aggregate level, so it was only included for descriptive purposes.

In a first analysis, mean difference tests were performed to contrast the changes in the ownership and use of the main financial instruments of households. The results revealed that the most widespread instrument is financial accounts, which shows a sustainable evolution in the three years of study for most of the countries. Chile, Brazil and Venezuela are the countries that have reached the highest level of account ownership for 2021. The next most used instrument is debit cards. These two instruments are considered more feasible to promote with financial inclusion policies, since they do not have costs for the users and can be boosted with programs to formalize operations and public transfers, generating more immediate changes.

Credit cards also showed a widespread diffusion and a more stable level in the years of study, with few significant differences. Brazil and Uruguay (top in 2014) are the countries that demonstrated the greatest uptake of this instrument.

Regarding formal savings and credit, the levels are lower in general, and there is no evidence of a generalized evolution for the years of study. Chile achieved a significant boost in the formal savings indicator, reaching 31% by 2021. Formal credit experienced a fall in 2017 in most of the countries, but recovered in 2021, except in Chile and Venezuela. The incentives for the use of these instruments are more difficult to specify, since they are related not only to the economic situation of individuals, but also to the costs and benefits that those services entail, and even to the history, practices and customs of each population. Macroeconomic aspects and political decisions are key actions that affect the financial market.

Mobile accounts and online payments were not even included in the 2011 Global Findex survey, while the levels of use for these instruments were very low in 2014. However, their average usage increased significantly for 2017 and 2021. In most countries, around a third of the sample had mobile accounts, and more than half of the individuals used online payment services in Chile and Venezuela for 2021. This shows how efficient digital services are as an alternative to traditional finance, contributing to the inclusion and formalization of the economy.

In turn, with a series of multivariate econometric models, it was found that, in the sample of the seven biggest Latin American countries for the 2017 micro-data, being male, older (up to a certain level), and with a higher level of education and income are determining variables of a greater probability of having or using the instruments analyzed in the three years of study. This profile result is in line with the main determinants found by Martinez et al. (2020) for the years of 2011 and 2014. Moreover, the database applied was the same as Martinez et al. (2022). Therefore, we updated the information on and reaffirmed the importance of a set of characteristics of people that determine the possession and use of some financial instruments in recent years. From this particular aspect, it is important to highlight the need for policies linked to gender equality, given that women have been facing lower probabilities of being financially included.

For most of the instruments, belonging to Argentina decreases the likelihood of having them compared to Chile or Venezuela (except for formal credit, which is an indirect probability). In Brazil, individuals are more likely to access financial accounts and formal savings, while there are no significant differences for formal credit and mobile accounts. However, Brazilians had lower probabilities of making digital payments than Argentines in 2017. Uruguay presents better chances of having financial accounts, formal credit and online payments than Argentina. On the other hand, individuals from Colombia and Peru are less likely to have access to financial accounts, but, for formal credit, the probability is higher than that of Argentina. It is worth emphasizing that Argentina has been experiencing inflation problems for a couple of years, which inevitably condition market interest rates, which is continuously growing and making credit too expensive and unstable.

Based on these difficulties, it is important to understand why people do not have a financial account. The main reasons in 2017 had to do with economic issues, such as not having enough funds or financial services being too expensive or too far away. For 2021, some of these restrictions were less mentioned, for instance, not having enough funds. However, the obstacles to accessing financial services did not change substantially, except in Chile in terms of reducing their cost.

These differences originated from the various levels of development of financial institutions, their cost structures, macro-economic variables and the uses and customs of people; but, they are also mainly due to the particular public policies to promote financial and digital inclusion. That is why, founded on these results, it would be of interest to review the policies of each country in the region that helped improve their levels of access and usage of formal financial services.

Other political ramifications of the research findings are in line with the debate about what kind of instruments should be promoted. The similarities in the percentages of use of financial accounts and debit cards are not accidental, since the instrument used for the operation of financial accounts are the same as for debit cards. However, the question that we must ask ourselves, and that which requires future research, is whether the cause of this lower use of other instruments (savings and formal credit, credit cards, online payments and use of fintech), is a phenomenon from the supply or demand side. The analysis of the causes emerging from the Global Findex survey attributes it solely to a demand phenomenon, since the reasons are indicated by the respondents.

Some questions that arise from the study are based on the characteristics that explain the greater use of financial instruments, which somehow establish a certain imbalance toward the population that is situated in high socioeconomic levels. This indicates that people of medium and low socioeconomic levels will have a low probability of accessing these instruments. Is this situation not analogous to the reality of small and medium enterprises, with respect to financing? Are there other obstacles on the demand side, but also on supply side (Stiglitz and Weis, 1981) that prevent these populations from accessing these instruments?

According to the analysis of this article, substantial progress still needs to be made concerning financial inclusion in Latin America, even in 2021, where it was expected that there would be much more access to formal financial services. However, it is recognized that informality and economic difficulties imply a strong step backward to promote inclusive finance in developing countries.

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Conflict of interest

The authors declare no conflict of interest.

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