



## Research Article

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# Financial Inclusion in Latin America 2007 - 2015: Evidence using Panel Data Analysis

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Doi: 10.2478/mjss-2018-0155

### Abstract

*Financial Inclusion plays an important role in terms of economic growth and poverty reduction owing to inequality, therefore, it is a key aspect of public policy in many governments. This study explores those variables that influence financial inclusion in some Latin American countries, through the use of the panel data econometric technique, based on information provided by the World Bank's Global Findex, and the Statistical Yearbook of the World Bank. ECLAC (Economic Commission for Latin America), during the period between 2007 and 2015. The sample includes 7 countries, namely, Argentina, Brazil, Chile, Colombia, Ecuador, Mexico and Peru. The results indicate that financial inclusion has a positive and significant relationship with the value of GDP per capita, such that the greater the income level which families have, the greater will be the participation in the financial system, and consequently, the greater the degree of financial inclusion. On the other hand, the variable public debt, shows that a high level of indebtedness hinders financial inclusion, therefore, its relationship is negative.*

**Keywords:** *Financial inclusion, economic growth, financial education, dimensions, panel data*

## 1. Introduction

The deepening and interconnectivity between financial systems is of vital importance in the economy, since this impacts and affects the economy in terms of savings, credit, collection methods, payment, investment, products and services for risk management to people with diverse needs (Honohan & Beck, 2007), and they are inclusive insofar as they allow ample access to the services and products offered, generating greater participation of individuals and companies, through the satisfaction of their particular needs and requirements, and the reduction of price barriers and tariffs (Demirguc-Kunt, & Klapper, 2012), in effect, the benefits of financial inclusion to the population in general, and especially, to low-income, are related to (linked with) the reduction of the levels of informality and poverty, also with the increase in the development and economic growth of the countries that promote it (Hernández, 2013).

However, in spite of its positive economic and social contribution, inadequate attention has been accorded to this area. Initially a financial intermediation and economic performance study, by Rousseau and Watchtel, in relation to the United Kingdom, Canada, Norway and Sweden for the

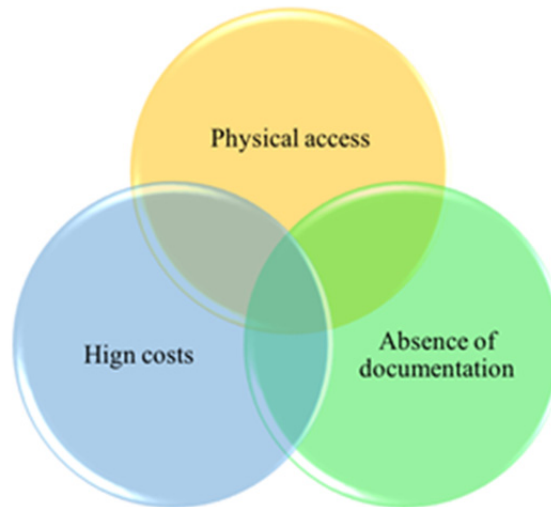
period 1870-1929, was presented in 1998.

In the process of financial expansion, different types of suppliers of financial products and services have been incorporated, being an access channel for people excluded from the system, through new opportunities. Access vehicles such as Non-Governmental Organizations (NGOs); cooperatives; community development institutions; commercial and state banks; insurance companies; telecommunications services and telegrams; post offices, and other companies that offer access to points of sale. Usually, new suppliers and business models are viable thanks to technological advances, such as the global expansion of mobile phones (World Bank, 2017).

The objective of the present investigation is to analyze financial inclusion in countries such as America; Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, and Peru, during the period 2007 - 2015, through a review of the literature, to determine and ascertain the representative variables, as well as analyze the impact presented in each country's samples, and to estimate an econometric data panel model to identify which financial and economic variables have an impact on financial inclusion.

### 1.1 Issue addressed

Access to financial services such as microcredit or savings as a strategy to overcome poverty is an issue that has been presented in the agendas of the current government, with the aim of achieving economic growth and development. However, the financial system is not equipped with enough tools to achieve the goal of facilitating financial services which allow access to these resources. According to a study conducted by the World Bank, there are three important barriers that hinder financial inclusion (Stein et al., 2011):



**Source:** Own elaboration from Stein, et al. (2011).

- Physical or geographical access: The distance people must travel to reach a financial institution or, the absence of these in certain isolated areas of the country makes it difficult to access financial services.
- Absence of adequate documentation: Banks or financial institutions have established requirements for people to access their services, along with requirements for the provision of specified and various documents for identification purposes, which, low-income people living in rural areas, or who work in informal activities do not have or find it difficult to gain access to.

- High prices, minimum requirements to open an account and other costs (fees): Financial institutions require minimum requirements and the payment of certain fees or fees to access their services.

Ignorance is a barrier to education which affects in terms of access, supply, financial education and consumer protection. As postulated by Gardeva & Rhyne (2011), the rural population does not demand products or financial services because they have no knowledge of their existence. In addition, it is affirmed that private financial institutions, and state entities that must offer products and services do not identify, neither do they know the real needs of the population. Such affirmation resulting from having dedicated themselves to carrying out market research, with the objective of expanding their product portfolio and services, physically cover areas where their presence is low or zero, analyzing potential users to assign risk rating and determine potential users, moving away from their objective to conduct comprehensive research to meet the particular needs of users who are financially excluded.

Further, educational gaps within the population, and more specifically, in respect of financial education and the understanding of basic financial concepts such as inflation, interest rate, relationship between risk and profitability, and on the operation of the capital market, are results that were extracted from a study conducted in Latin America by García et al. (2013). The study being conducted in respect of financial education, which hinders a correct determination of financial inclusion, increasing the economic gap, and access to the financial system, as manifested in poverty indices, and inequality.

## 2. Review of the Literature

### 2.1 Financial Inclusion

According to the International Financial Education Network INFE (2012), Financial Inclusion is defined as the process of promoting affordable, timely access, suitable for a wide range of regulated financial products and services, and expanding its use by all segments of society, such that it can contribute significantly to economic growth to the extent that it effectively reduces the costs of financing, insuring and managing resources, both for individuals and for companies (Banco de la República, 2014).

The dimensions of Financial Inclusion according to the National Banking and Securities Commission (CNBV) in Mexico, 2012 b, cited by Racanello & Herrera (2014) correspond to access, use, regulation, consumer protection and financial education.

It should be noted that financial education comprises three key aspects for the European Commission; a) acquiring knowledge and understanding of finance related to basic concepts that each person must know, b) developing skills in this area, that is, have the ability to use knowledge for their own benefit, and c) exercising financial responsibility, that is, carry out an adequate management of personal finances, assuming decisions in a responsible manner.

Based on prior and current research, there are three rationales that explain the focus given to financial education programs: i) the confirmation of their generalized insufficiency among the population, ii) the complexity of financial markets and products, and iii) the attribution of important individual and social advantages to the extension of the financial culture among citizens (Banca de Oportunidades, 2015).

The benefits of financial inclusion for the population, especially low-income earners, are attributed to the reduction of levels of informality, poverty reduction, development and economic growth of the countries that promote it (Hernández, 2013), as well as the positive relationship which exists between greater financial inclusion and better access to financial services, as represented by lower banking costs, closer proximity to bank branches and fewer documentation requirements, reflecting those impacted by financial inclusion, namely those people who are exposed to financial exclusion - as determined by their level of income (low), and geographical location (remote areas of cities, or rural areas) (Allen, 2012).

## 2.2 Financial inclusion and economic growth

Two lines of arguments account for the mysteries related to economic growth. These lines of argument are based on the determination of the positive and/or negative association between the general economic growth of countries and their relationship with economic and financial development through the inclusion of the general population in the system.

The relationships and positive association between economic growth and development have been linked through previous studies to this investigation; Smith (1776) says that financial institutions contribute to economic production from the management of capital, and an efficient allocation of resources, incorporating unproductive capital, and transforming it into productive capital through the generation of returns, and empirical association exists between the financial structure, global financial development and economic growth demonstrated in a study conducted with 33 countries shows in the period 1860 and 1963, which documented how the structure of financial systems changes as countries develop, analyzing the value of the assets of financial intermediaries as a proportion of GDP (Goldsmith, 1969).

Economic growth and financial development are mutually dependent, financial system indicators and long-term growth are correlated, through the performance of banks. Participation in investment, efficiency of investment, and financial policies, linked in a greater credit and financial flow in relation to the GDP (Gertler & Rose, 1994). Financial and securities markets provide important services of; liquidity, capital accumulation, and productivity improvements by positively associating growth (Levine & Zervos, 1998).

Deeper integration and greater expansion within the financial system can influence decisions about economic agents as it offers a diversity of products and services to carry out savings, credit, resource channeling, production or investment operations, through risk management, and reduction of transaction costs, promoting technological innovation and economic growth (Schumpeter, 1911), and the relationship of financial agreements and trade agreements through the reduction of information costs, given that, credit information is a restriction for the development of the expansion of financial products and services (Jaffee & Russell (1976), Stiglitz and Weiss (1981), and transaction restriction, is associated with legal, regulatory and political factors (Townsend (1979); Aghion & Bolton (1992). ), Hart & Moore (1994, 1998).

The negative association between economic growth and development has been demonstrated by previous studies, in relation to this investigation. Proposed in the theory of endogenous growth supported by Romer (1986), it represents a completely specified model of long-term growth. Knowledge is an input in production that increases marginal productivity, that is, the increase in knowledge and its practical execution increases productivity and physical capital by maximizing the benefits of the aggregate level of knowledge, through a production relationship of consumer goods based on the stock of knowledge, presenting systemic growth of the economy. In addition, knowledge, and production processes, associated technology, are incorporated as a means of accounting for economic growth, such that countries with greater implementation of technology are demonstrated to have competitive advantages (Lucas, 1988).

Gregorio & Guidotti (1995) examined the empirical relationship between long-term growth and financial development, through the relationship between bank credit to the private sector and GDP, concluding a negative impact on a panel data for Latin America, due to financial liberalization in an environment with poor regulation. In respect of countries with underdeveloped financial systems, it was highlighted that progress towards a more developed financial system reduces the profitability of banks and margins, since inefficiencies in resources, behavior of uncompetitive prices, profitability and high interest margins, exist in underdeveloped banking markets. However, with greater banking development, competition increases, there are relatively lower benefits and efficiency (Demirguc-Kunt & Huizinga, 2000).

Likewise, Yu & Gan (2010) affirm for the case of Malaysia, that the empirical results suggest that a higher GDP will strengthen the development of the banking sector. However, financial liberalization seems to destabilize the banking sector, therefore, the financial reforms in Malaysia demands that financial liberalization occurs at a later stage, when solid macroeconomic policies already exist.

Ardic & Damar (2006) conducted a study on the effects of “deepening” within the financial sector on economic growth, using a provincial-level data set based on the period 1996-2001 on Turkey, indicating a negative relationship between deposits as a proportion of real GDP per capita and economic growth.

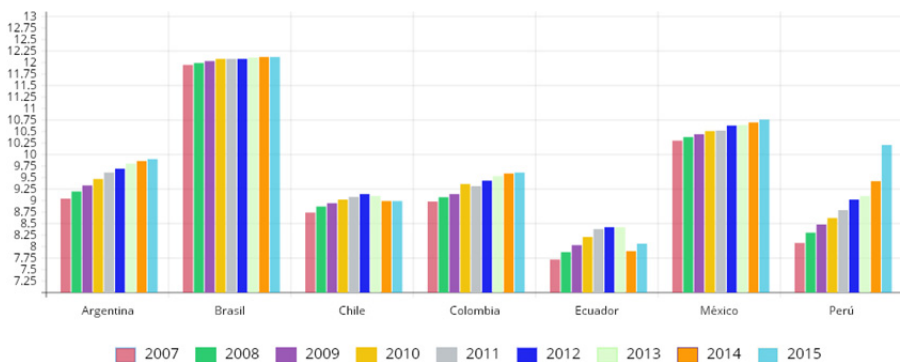
### 2.3 Determinants of Financial Inclusion

These studies constitute those conducted in relation to the determinants of financial inclusion. At the macro level, Sarma (2008) considers the dimensions of the number of banking institutions, availability of banking services and use of the banking system; Arora (2010) physical access, transaction facility and transactions, Gupte, Venkataramani & Gupta (2012) scope, use, transaction and transaction cost, Amidzic, Massara & Mialou (2014) scope, quality of use and cost. At the micro level, there are other determinants of financial inclusion, highlighting Morduch (1995), which considers the variables of consumption, household income, in the case of Beck, Demirguc-Kunt & Peria (2007) use of formal accounts, behavior savings, sources of loans and the use of products related to health insurance and insurance; Cano Esguerra, García, Rueda & Velasco (2014) demographic variables gender, age, educational level, geographical location, employment situation, income level and household size.

### 2.4 Stylized facts

Analyzing the information provided by the Global Findex of the World Bank in 2015, for the countries Argentina, Brazil, Chile, Colombia, Ecuador, Mexico and Peru, some variables were determined as a proxy of financial inclusion, categorized according to the dimensions of access, and use, including their respective analyses with information obtained from the financial inclusion reports in each country and other studies:

In order to conduct this study, the analysis of the automatic teller machine variable is initiated, as reflected in figure 1, which shows that the country with the largest number corresponds to Brazil. The explanatory variable being the size of the country – additionally, that in the most remote municipalities, there exists at least one cashier located in places of great circulation. This is followed by Mexico, which presents an increase caused by the adequacy of ATMs, and an increase of 2% in rural municipalities.

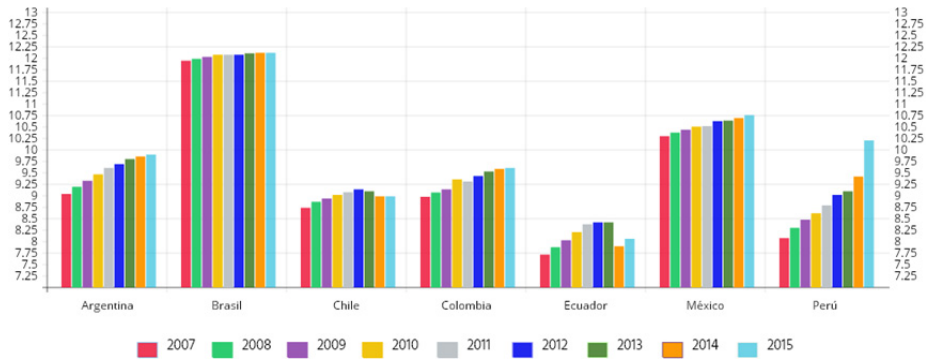


**Figure 1.** Number of Automatic Teller Machines 2007-2015 in logarithms

**Source:** Global Findex

In Colombia and Peru, there is a significant increase in the number of ATMs associated with the reduction of costs for withdrawals in the case of the former and the incorporation of ATMs located in remote municipalities in the case of the latter.

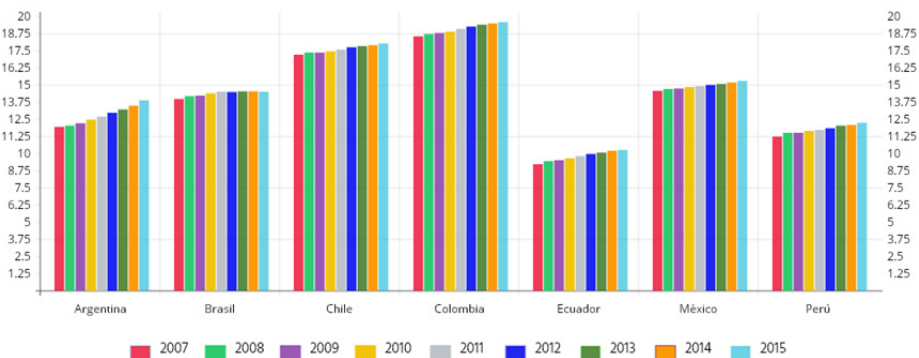
In Argentina, the increase in the variable is attributed to the mandatory use of payroll accounts, which have no handling cost and allow access to the entire ATM network. Similarly, in Chile, the regions have at least one ATM per thousand inhabitants, and there is a decrease due to the substitution of face-to-face mechanisms by remote (facilitating) mechanisms. And finally, Ecuador shows a decrease in the last two years due to the maximum level of banking in certain sectors of the city and in specific regions, as well as the substitution of face-to-face mechanisms by remote mechanisms. Applying this, the analysis is continued with the variable branches of commercial banks (figure 2), the rationales that explain the behavior of this variable is presented below:



**Figure 2.** Branches of commercial banks 2007-2015

Initially, Peru is identified as the country that experienced the most significant growth during the analysis period, as accounted for by the opening of 58 branches in intermediate municipalities and cities that did not have a branch. Thereafter, Argentina, the increase of 68 branches (traditional channel of access to financial products and services) being minimal, given the costs involved in the creation of a new branch.

In other countries, there is an increase due to the opening of branches concentrated in cities and intermediate municipalities (Colombia and Brazil). In Mexico, the establishment of branches in Tila, Guadalupe, and Calvo, and 56 rural municipalities which have at least one branch. In Ecuador, the different entities offer financial products and services that have attracted a greater number of users, as well as accorded greater attention in municipalities already served. Finally, in Chile all regions have at least one branch for every 10,000 adults, and the decrease in the number of branches is attributed to the incorporation of mechanisms which facilitate banking for users in remote areas.



**Figure 3.** Deposits in commercial banks 2007-2015.

With respect to the variable deposits in commercial banks (figure 3.), Colombia is highlighted, since it is the country that reflects the highest number of deposits in commercial banks, that is based on the number of users that create savings accounts, electronic savings accounts, and electronic deposit accounts, whose savings are constantly inactive, therefore, have made regulatory adjustments that include the creation of savings products simplified procedure and the possibility of entry of new agents in the provision of deposits of electronic money. The rationales that explain the behavior of this variable in each country correspond to:

**Brazil:** this is a basic service, increasing the offer of special deposit accounts created to serve the low-income population, which can be both demand deposit accounts and savings accounts. Opening such accounts minimizes the identification requirements of the holders, (but the limits for the movement are low) however account activities are restricted, as a means of avoiding the risk of being misused in money laundering activities, maximum monthly balance limit of USD 950, and maximum to block the UDS 1,900 accounts, and the risk reduction conditions are improved to 0 for the users.

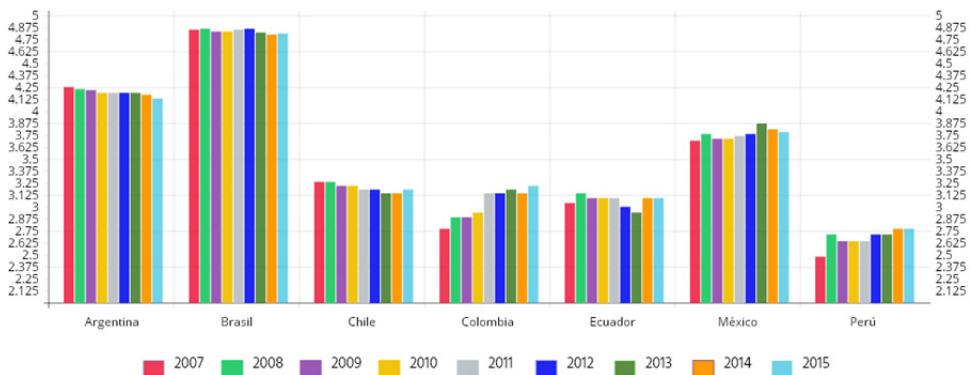
**Mexico:** increase in savings accounts for retirement, with non-financial platforms that facilitate the opening of accounts.

**Argentina:** the number of people who deposit money in their account once or twice a month is higher than 63% and those who deposit more than twice a month do not reach 13%, the largest number of deposits are made by men 36% and women 33%,

**Chile;** 70% of the adult population has a demand deposit account, 4% term deposit account, 69% savings account, 72% debit card (the main payment instrument used, the average transaction amount does not exceed USD 57).

**Peru:** 21 low-income municipalities have opened savings accounts for their citizens through basic savings accounts, and simplified, with the aim of addressing unforeseen situations, and boost savings with a view to investing in the stock market.

**Ecuador:** increases the participation of users by addressing issues impacting the non-payment of maintenance of the accounts, also, each inhabitant of the country has on average two bank accounts, although there are those who have three or four different deposit documents.



**Figure 4.** Commercial bank institutions 2007-2015

Regarding the commercial banks institutions (figure 4.), the reasons that explain the behavior of this variable in each country correspond to:

The countries that experienced reductions are: Brazil, presents reduction that begins in 2013 with 128 institutions to 123 in 2015, without affecting the access of users to financial products and services, and caused by structuring of the concession regulation of permits, and records for the establishment of financial intermediaries, as well as documents efforts aimed at improving quality. In Argentina, the reduction presented began in 2007 with 70 institutions, and in 2015 with 62, as a result of a process of mergers, takeovers (frontline banks to small entities) and acquisitions of

shares of local entities, generating concentration, and legal structuring to improve the quality of financial products and services offered. In respect of Chile, there is a reduction from the period between 2007 to 2015 with 24 institutions, initiated by the implementation of a regulatory strategy on the increase of products and services in the portfolios offered, guaranteeing quality, and less documentation requirements, in state and private banks.

On the other hand, in Mexico: This witnessed an increase caused by the authorization, and granting of permits for the start of operations of new institutions, for the expansion of possibilities of access to financial products and services having greater supply, better quality, and lower prices for users, due to competition, and location in municipalities that were not characterized by the presence of financial entities.

In Colombia, there was a rise in the number of institutions that offered diversity of products and services, and purchases of banks in the region by local banks, incorporating into the market Bancamía (2008), WWB (2010), Coomeva, Finandina, Falabella, Pichincha (2011), Santander de Negocios (2013), Banco Mundo Mujer (2014), Banco Compartir (2015).

As regards Ecuador, during the second semester of 2014, the Ecuadorian economy went into a slowdown and, during the second semester of 2015, the economic cycle began a recession that was marked by periods of low growth. In addition, a reduction of entities was witnessed in the banking sector, generating market concentration, constituted by the consolidation of the large participants and the sale or merger of the assets of the small entities and Peru, increase of institutions that offer diversity of products and services with greater proximity to cater to the attention and needs of the users of such services.

### 3. Methodology

Supported by Hernandez (2014), the descriptive studies seek to specify properties and important characteristics of any phenomenon that is analyzed. Therefore, the proposed research is descriptive and analytical in nature, since it aims to describe and analyze the facts inherent to financial inclusion and the consequences of macroeconomic fluctuations of some variables in some Latin American countries; Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, and Peru. The methodological procedure developed includes quantitative collection techniques, through the collection of statistical information. The systematization and analysis of the information was undertaken through the Microsoft Excel program and specialized software for statistical analysis STATA. (The information sources are secondary from the information provided in the Global Findex of the World Bank (2015) on progress in terms of Financial Inclusion, and of the Statistical Yearbook of ECLAC (Economic Commission for Latin America) on macroeconomic variables.)

Secondary based information sources are used in contrast to the information provided in the Global Findex of the World Bank (2015) on progress in terms of Financial Inclusion, and of the Statistical Yearbook of ECLAC (Economic Commission for Latin America) on macroeconomic variables.

### 4. Model Specification

In order to construct the model, we will apply the method that was proposed in Hsiao (2014) – as regards the panel data methodology, since it establishes the way to analyze information from a sample (countries) and in turn provides multiple time horizons (2007-2015). Among those advantages that can be highlighted, are those related to making more precise, statistical inference of the parameters of the model and at the same time, greater capacity to construct and validate hypotheses adjusted to reality. Through data panel models, the following relationships are specified to estimates. The objective being to determine the impact that different economic variables have on the explanation of Financial Inclusion, for which four models are estimated in which the ATMs variables are taken, ATMs for 1000 km<sup>2</sup>., branches and deposit accounts as a proxy for financial inclusion.

$$\text{Model 1: } CA_{it} = \beta_0 + \beta_1\text{PPC} + \beta_2\text{DP} + \beta_3\text{INF} + \beta_4\text{Des} + \beta_5\text{Ti} + \mu$$

$$\text{Model 2: } \text{ATM}_{it} = \beta_0 + \beta_1\text{PPC} + \beta_2\text{DP} + \beta_3\text{INF} + \beta_4\text{Des} + \beta_5\text{Ti} + \mu$$



Model 3:  $SUC_{it} = \beta_0 + \beta_1PPC + \beta_2DP + \beta_3INF + \beta_4Des + \beta_5Ti + \mu$

Model 4:  $CD_{it} = \beta_0 + \beta_1PPC + \beta_2DP + \beta_3INF + \beta_4Des + \beta_5Ti + \mu$

> Financial variables:

CA = ATMs

ATM = Automatic teller machines (ATM) per 1,000 km<sup>2</sup>

SUC = Branches commercial banks

CD = Deposit accounts with commercial banks

> Economic variables:

PPC = Per capita GDP

DP = Public debt as a percentage of GDP,

INF = Inflation

Ti = Central Bank intervention rate

Des = unemployment rate.

$\mu$  = random term or error.

In respect of the linear estimates of panel data, the issues raised in Cobacho and Mossi (2009) which generate these specifications will be taken into account, as follows:

$$y_{it} = x'_{it} \beta + \varepsilon_{it} \quad (1)$$

Where the subscript  $i$  ( $= 1, 2, \dots, N$ ) indicates the cross-section unit,  $t$  ( $= 1, 2, \dots, T_i$ ) indicates the different periods of time,  $y_{it}$  are the dependent or explained variables (returning),  $x_{it}$  the independent or explanatory variables (regressor),  $\beta$  is the vector of parameters to be estimated and  $\varepsilon_{it}$  the error term or random perturbation, all components of the classical linear regression model. If for each cross-section unit there is the same number of temporal observations, that is, if  $T_i = T$  for each  $i$ , it is said that the panel data is balanced, which is true for the present case.

## 5. Results

Highlighting the different studies carried out at international and national level, and reviewing the results presented in the research, barriers which do not facilitate a correct representation of Financial Inclusion, and which highlight associated variables are identified:

- Geographical: location in the peripheries of cities, in rural areas, municipalities with low economic growth.
- Demographic: age, biological sex, level of income, high unemployment rate, profession, belonging to the informal sector, being domestic workers, or of a family business without pay, low educational levels, receiving cash wages, cultural beliefs.
- Psychographic: lifestyle, personality, values, ethics, morals, attitudes and interests.
- Behavioral: search for the benefit, rate of use of the product and service, and loyalty to the financial entity.
- Financial entities: they are characterized by having ignorance of the needs of users and excluded agents, when they know the needs they do not have the products and services to satisfy them, they have the products or services but they can not offer them due to restrictions associated with risk, costs and/or regulation, and the advice offered to users are simplistic and shallow.
- Rigorous documentation requirements are imposed for identification purposes, high transaction costs, concentration of financial products and services aimed at meeting the needs of users who have purchasing power and are located in urban populations, thus excluding people located in the cities. peripheries of cities, who have lower levels of education and income.
- Agents: they do not identify the products and services they need, and if they identify them they are not informed if the products exist. If they know they exist, do not have access to them or exclude themselves (due to informality, distrust of public and private financial entities caused by financial scandals, lack of transparency of information, and high interest costs, management fees and financial charges).
- Government entities: Although in recent years, government entities have analyzed and

understood the importance of Financial Inclusion and have established regulations with the objective of implementing it, and increasing their indicators, despite such efforts, laws are outdated, they are not in accordance with the needs of the population, in addition, they have ceded their responsibility, to public and private financial entities.

There is lack of investment in the telecommunications sector, as well as the financial education sector. Financial education is a subject with many limitations and deficiencies, state entities have delegated their responsibility to financial institutions, who have dedicated themselves to posting videos, and to creating stories on their web pages, strategies that fall short of meeting educational needs and requirements. The results of the application of the estimates using panel data are presented in table 1, in which the regressions of the 4 models presented above appear.

**Table 1.** Results of the regressions. Determinants of Financial Inclusion in some Latin American countries.

<b>Estimates Log - Log</b>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
	Log Automatic teller machines (ATMs)	Log Automatic teller machines (ATM) per 1,000 km <sup>2</sup>	Log Branches of commercial banks	Log Deposit accounts with commercial banks for every 1,000 adults
<b>Independent Variable</b>	Coefficient	Coefficient	Coefficient	Coefficient
Constant	-29.97412***	-36.49338***	-25.53928***	-16.14357***
Log GDP per cápita	4.432085***	4.43561***	3.942775***	2.683504***
Log Public Debt	-.2479068*	-.2481961*	-.0300989	-.0874291
Log Inflation	-.0414484	-.0413071	-.0012489	.0110029
Log Unemployment	.626319***	.6258201***	-.1117265	.0397164
Log Interest Rate	-.0060263	-.0057759	-.2860604 ***	-.0428574
Number of obs	90	90	90	90
Number of Countries	10	10	10	10
R-sq: within	0.6121	0.6120	0.5989	0.6236
F(5,75)	23.67	23.66	22.39	24.19
corr(u <sub>i</sub> , X <sub>b</sub> )	-0.8188	-0.9440	-0.7311	-0.9741

Note: \* denoted p<0.05; \*\* denoted p< 0.01; \*\*\* denoted p<0.001

**Source:** authors

In the first regression analysis, the ATM variable CA was considered the dependent variable. The results show that the Pib per capita variable (PPC) has a statistically significant positive relationship with the CA variable (Coefficient 4.43 and p <0.001), this indicating that for every 1% in the increase of the PPC, the number of ATMs will increase by 4.43%, which is in line with the argument that higher levels of income will involve greater use of the services offered by the financial system for financing and investment, additional associates and that the PPC as a variable of economic growth has a positive relationship with the FI in a positive manner as established by the theory; On the other hand, the R<sup>2</sup> is equal to 0.61, this indicates that 61% of the variance in the number of ATMs is determined by the independent variables selected. Regarding the unemployment variable (p <0.001), it is statistically significant but the expected sign does not correspond, on the Public Debt side (p <0.05) it is expected that an increase of 1% will decrease in 0.24% the IF, and other variables are not significant in the model.

In the second regression analysis, the results are very similar to those in model 1, in which the PPC, the GP and the DES are relevant in the model, but the only one that fulfills the expected sign is the PPC, this according to the results by Gebregziabher and Makina (2015). Regarding the other models, none of the variables is significant except for the PPC.

There is a positive relationship between the growth and development of the economy – as shown in (as reflected by) the evolution of GDP and the variation in the unemployment rate. The results are consistent with the theory of Okun (1970) who deals with a dynamic law on the acceleration of GDP and its impact on the generation of employment. Thus, if the GDP increases,

unemployment decreases in a similar proportion, and vice versa. In effect, based on the results of the panel data model, the Latin American economies analyzed present the banking sector as a source of economic growth, insofar as it is inclusive, innovates, offers different products and services, and applies strategies to attract customers through the decrease of requirements and costs.

## 6. Conclusions and Recommendations

In Colombia, and the different countries analyzed, there is a positive relationship between more inclusive financial systems, the level of economic development of the countries and the well-being of the population, associated with the strengthening of regulations, physical and geographic coverage through expansion of the network of ATMs, branches, and incorporation of mobile technology, and internet, reduction of transaction costs, and increase in the portfolio of products and services.

Financial inclusion is positively and significantly related to the value of GDP per capita. Statistically significant, the variable unemployment and the variable public debt statistics show that a high level of indebtedness hinders financial inclusion, and that the economic growth of the countries is related to the economic and financial development through the inclusion of the general population, and the integration of financial systems.

In order to facilitate a process of comprehensive financial inclusion, the following is necessary: the restructuring, and modification of established laws; complementing the current approach through the promotion of financial inclusion, encouragement of competition, consumer protection, supervision of the financial sector, and financial education; investment in the telecommunications sector, and the analysis of the incentives that banks have to develop financial products and services (comprehensive research as a means of gaining insight – as well as meeting the needs of current financial users, and individuals who are excluded, lower costs, and the fulfilment of required documentation, risk mitigation, profitability, innovation in products and services, and the provision of further information). From the demand perspective, a focus on social aspects (residents in marginalized urban areas, rural, women, the elderly, young, unemployed, domestic workers, and informal workers), income level (low, irregular, null) and level of education, is also important.

Likewise, the existing regulation, modifications made, and the new regulations must be adequate to meet the needs of the population, free from competition posed by financial intermediaries, and supervised by government entities that verify compliance with the laws, and in the same way, impose and enforce sanctions when these have not been fulfilled. In order to have effective channels which attend to complaints, suggestions and recommendations made by users to public, private and mixed financial entities, and from state entities, serve and function to provide follow-ups as a means of resolving nonconformities and act as intermediaries between entities and users.

## References

- Aghion, P., & Bolton, P. (1992). An incomplete contracts approach to corporate bankruptcy. *Review of Economics Studie*.
- Allen, F., Demirguc-Kunt, A., Klapper, L., Soledad, M., & Peria, M. (2012). *The Foundations of Financial Inclusion. Understanding Ownership and Use of Formal Accounts*. The World Bank. Development Research Group. Finance and Private Sector. Development Team. Policy Research Working Paper.
- Amidzic, G., Massara, A., & Mialou, A. (2014). *Assessing Countries Financial Inclusion Standing—A New Composite Index*. IMF working paper WP/14/36.
- Ardic, O. P., & Damar, H. E. (2006). Financial sector deepening and economic growth: Evidence From Turkey. *Topics in Middle Eastern and African Economies*. Volumen (9).
- Arora, R. (2010). *Measuring Financial Access*. Griffith University, Discussion Paper Economics. Volumen (7).
- Banca de las Oportunidades. (2015). *Reporte de inclusión financiera en Colombia*. Descargado el 05 de abril de 2017, de: [http://bancadelasoportunidades.gov.co/documentos/1\\_Cobertura.pdf](http://bancadelasoportunidades.gov.co/documentos/1_Cobertura.pdf)
- Banco Central Do Brasil. (2015). *Relatorio de Inclusao Financeira*. Descargado el 05 abril de 2017, de: <https://www.bcb.gov.br/Nor/relinclin/RIF2015.pdf>.

- Beck, T., Demirguc-Kunt, A., & Peria, M. S. M. (2007). Reaching out: Access to and use of banking services across countries. *Journal of Financial Economics*. Volumen 85.
- Cano, C. G., Esguerra, M. P., García, N., Rueda, J. L., & Velasco, A. M. (2014). *Inclusión Financiera en Colombia*. Banco de la República.
- Cobacho Tornel, M. B. y M. Bosch Mossi. (2005). Contrastes de hipótesis en datos de panel. XIII Jornadas de ASEPUMA. Volumen 2 (7).
- Consejo Nacional de Inclusión Financiera. (2016). Reporte Nacional de Inclusión Financiera. México. <http://www.cnbv.gob.mx/Inclusi%C3%B3n/Documents/Reportes%20de%20IF/Reporte%20de%20Inclusion%20Financiera%207.pdf>
- Comisión Multisectorial de Inclusión Financiera. (2016). Reporte anual de la estrategia nacional de inclusión financiera del Perú. [http://www.midis.gob.pe/index.php/es/fednormativa/cat\\_view/176-estrategia-nacional-de-inclusion-financiera](http://www.midis.gob.pe/index.php/es/fednormativa/cat_view/176-estrategia-nacional-de-inclusion-financiera)
- De Gregorio, J., & Guidotti, P. (1995). Financial development and economic growth. *World development*. Volumen (23).
- Demirgüc-Kunt, A., & Huizinga, H. (2000). *Financial structure and bank profitability*. Cambridge: MIT Press.
- Demirguc-Kunt, A., & Klapper, L. (2012). *Measuring Financial Inclusion: The Global Findex*. Database. Policy Research Working Paper N° 6025, World Bank, Washington, DC.
- García, N., Grifoni, A., López, J.C., & Mejía D.M. (2013). La educación financiera en América Latina y el Caribe Situación actual y perspectivas. *Serie Políticas Públicas y Transformación Productiva* N° 12.
- Gebregziabher, K., & Makina, D. (2015). Financial Inclusion in selected Asian Countries: Evidence Using Dynamic Panel Data Analysis. Available at SSRN: <https://ssrn.com/abstract=2636564> or <http://dx.doi.org/10.2139/ssrn.2636564>
- Gertler, M., and Gilchrist, S. (1994). Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms. *Quarterly Journal of Economics*. Volumen 109.
- Giannatale, S., Elbittar, A., Maya, L., Ramírez, A., & Roa M, J. (2012). *Redes sociales, confianza y hábitos financieros: un análisis empírico*. Centro de Estudios Monetarios Latinoamericanos CEMLA.
- Goldsmith, R.W., (1969). *Financial Structure and Development*. New Haven, Yale University Press.
- Guerrero, R. (2015). *Inclusión financiera, camino a recorrer en Ecuador*. El Universo.com.
- Gupte, R., Venkataramani, B., & Gupta, D. (2012). Computation of financial inclusion index for India. *International Journal of Procedia - Social and Behavioral Sciences*. Volumen 37.
- Hart, O. y J. Moore (1994). A theory of debt based on the inalienability of human capital. *Quarterly Journal of Economics*. Volumen 109.
- Hernández, G., (2013). *Palabras del superintendente financiero, en el IV congreso de acceso a servicios financieros, sistemas y herramientas de pago de Asobancaria*. Cartagena de Indias – Colombia.
- Hernandez, R. (2014). *Metodología de la investigación*. McGraw-Hill Education. Edición 6.
- Honohan, P. and Beck, T. (2007). *Making Finance Work for Africa*, World Bank, Washington D.C. • Hsiao, C. (2014). *Analysis of Panel data*. New York, USA. Cambridge University Press.
- Jaffee, D. & T. Russell. (1976). Imperfect information, uncertainty and credit rationing. *Quarterly Journal of Economics*. Volumen 90.
- Levine, R., & Zervos, S. (1998). *Stock Markets, Banks, and Economic Growth*. *World Bank American Economic Review*. Volumen 88 (3).
- Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*. Volumen 22.
- Morduch, J., (1995). Income Smoothing and Consumption Smoothing. *Journal of Economic Perspectives*. Volumen 9 (3).
- Moosa, I., (1998). Cyclical output, cyclical unemployment, and Okun's coefficient. A structural time series approach." *International Review of Economics and Finance*, Vol. 8, pp. 293-304.
- Patiño Castro, O. A. (2010). *El modelo MIFE como instrumento para la formalización del empresariado. Una aplicación para las microempresas informales de Bogotá D.C*. Tesis de grado doctoral, Universidad Nebrija, Madrid.
- Raccanello, K., & Herrera G. E. (2014). Educación e inclusión financiera. *Revista Latinoamericana de Estudios Educativos México*. Volumen. XLIV (2).
- Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *The Journal of Political Economy*. Volumen 94 (5).
- Rousseau, P., & Wachtel P. (1998). Financial Intermediation and Economic Performance: Historical Evidence from Five Industrialized Countries. *Journal of Money, Credit and Banking*. Volumen 30.
- Sarma, M. (2008). *Index of Financial Inclusion*. Indian Council for Research on International Economic Relations. Working Paper 215.
- Schumpeter, J. A. (1911). *The Theory of Economic Development*. *The Quarterly Journal of Economics* Vol. 7 No 2.
- Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Edited by S. M. Soares. MetaLibri Digital. Library, 29th May 2007.

- Stein, P., Randhawa, B., & Bilandzic, N., (2011). *Toward Universal Access: Addressing the Global Challenge of Financial Inclusion*. International Finance Corporation, 125 World Bank Group.
- Stiglitz, J. y A. Weiss (1981). Credit Rationing in Markets with imperfect information. *American Economic Review*. Volumen 71 (3).
- Superintendencia de Bancos e Instituciones Financieras Chile. (2016). *Informe de Inclusión Financiera en Chile*. Descargado el 20 de mayo de 2017, de: [http://www.sbif.cl/sbifweb3/internet/archivos/publicacion\\_11243.pdf](http://www.sbif.cl/sbifweb3/internet/archivos/publicacion_11243.pdf).
- Superintendencia Financiera de Colombia. (2015). *Reporte de inclusión financiera*. Descargado el 25 de mayo de 2017, de: <https://www.superfinanciera.gov.co/jsp/loader.jsf?!Servicio=Publicaciones&ITipo=publicaciones&IFuncion=loadContenidoPublicacion&id=10085394>
- Tuesta, D., Sorensen, G., Haring, A. y Cámara, N. (2015). *Inclusión financiera y sus determinantes: el caso argentino*. Documento de Trabajo n° 15/04. Madrid.
- Townsend, R. (1979). Optimal contracts and competitive markets with costly state verification. *Journal of Economic Theory*. Volumen 21.
- World Bank Global Findex. (2015). Descargado el 01 de abril de 2017, de: <http://www.worldbank.org/en/programs/globalfindex>
- Yu, H., & Gan, P, T. (2010). The determinant of banking sector development: Malaysian experience. *International Research Journal of Finance and Economics*.