ECONOMICS & Sociology

Novoa-Hoyos, A., Depoo, L., & Jiménez-Rodríguez, E. (2022). Role of financial literacy and awareness of tax impacts in an emerging economy facing tax reform. *Economics and Sociology*, *15*(1), 222-240. doi:10.14254/2071-789X.2022/15-1/14

ROLE OF FINANCIAL LITERACY AND AWARENESS OF TAX IMPACTS IN AN EMERGING ECONOMY FACING TAX REFORM

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Received: February, 2021
1st Revision: May, 2021
2nd Revision: November, 2021
Accepted: March, 2022

DOI: 10.14254/2071-789X.2022/15-1/14

ABSTRACT. This study seeks to assess the levels of financial literacy based on demographic characteristics of residents in Bogotá, capital of Colombia. Given the massive public demonstrations against tax reforms that have been taking place in large cities in Colombia in 2021, this paper analyses the knowledge of people of the nature and impact of tax reforms, especifically their financial understanding of the impact of these fiscal policies. Utilizing regression analysis with a quantitative and qualitative research design, the article investigates the degree of financial literacy and the relation between the financial knowledge and the current orientation in tax policy changes and their impact on the population. The data used in this study was gathered from 6,713 households in Bogotá and supplemented by in-depth interviews of representatives of each demographic group selected by careful sampling to represent each demographic characteristic. The results are structured in two parts, firstly, based on the analysis of three variables measuring levels of financial literacy of individuals relating to the interest rate, inflation and the principle of risk diversification. Secondly, qualitative research added two questions on knowledge of tax reform. Logistic regression was used. Results of both qualitative and quantitative research show that there is significant difference in the financial knowledge of people of different age, marital status and education. Interviews showed the best awareness and orientation in the mid-age group, predominantly men, who are seen as leaders. The most vulnerable group is low-educated single women. Limitation of the study is the narrow focus on households in one city. This article provides an insight into the importance of financial literacy, its monitoring, implementation of continuous improvement based on feedback loop in an economy in transition.

JEL Classification: A20, D14

Keywords: financial literacy, Colombia, demography, household economic sustainability, developing country, logistic regression, content analysis

Introduction

Increasing financial literacy is considered one of the world's priorities at a social level in all economies as measured by individuals' understanding of fiscal policy as well as management of their financial resources. Financial literacy is an essential element for people to manage their financial affairs and can make a prudent contribution to the soundness and efficiency of the financial system and performance of the economy (Kefela, 2011). This study examines empirical data gathered from participants residing in Colombia, an emerging economy. In recent times, financial literacy has been widely promoted as a crucial skill especially after the financial crisis in 2008 (Ayhan, 2019). In today's economy, it is going to be one of the determinants of post-Covid restoration of households' economy. Van Ooijem and Van Rooij (2016) state that a limited understanding of mortgage contracts and their risks may have contributed to the outbreak of the 2008 financial crisis. As a result, more and more governments are concerned with implementing financial education policies and strategies into compulsory education to promote the impact of financial decisions on long term household stability as well as nations.

The importance of financial literacy is rooted in the three pillars of sustainable development which are social justice, preservation of the environment and economic progress with the purpose of improving the quality of life of the population. Moreover, within the framework of the seventeen objectives of sustainable development of the United Nations (UN), specially the objectives aimed at eradicating poverty, improving quality education and implementing sustainable production and consumption. The results presented in this paper provides a framework to bring valuable input for economic authorities and educational institutions to formulate targeted and effective policies and strategies for financial education.

The findings of this study can contribute to UN objectives number one (End poverty) and four (Quality education), as those will bring input to the implementation of programs and policies aimed at enabling the population to acquire necessary knowledge to promote development and sustainable lifestyles. Increasing financial knowledge and awareness of more sustainable consumption and production in families will contribute to households having greater stability in their personal finances and possibly access to financial services such as microfinancing. A low level of public financial awareness can lead to inappropriate decision making, because households are not necessarily aware nor understand the impact of the risks they face in their day-to-day financial decisions (Kefela, 2011). This paper contains a review of the existing literature, present methods and statistical description of the data, in the next section results are presented, which are further discussed along with conclusions and recommendations.

1. Literature review

Financial literacy is highly relevant and current issue as it is on agenda of the government of all countries, developed and developing, and has been the object of study worldwide. This paper provides evidence, as stated by Razen *et al*. (2020) that financial literacy is important driver of health, income, and general well-being. Oliver-Márquez *et al*. (2021) explored the importance of measuring financial knowledge from a macroeconomic perspective, to explore its effects on economic variables such as development and inequality.

Bannier and Shwarz (2018) and Razen *et al*., (2020) stated that greater financial education leads to greater wealth and higher education reinforces this effect considerably. The same is supported by Dewi *et al*. (2020) in their investigation and concluded that the level of financial literacy defines also level of rationality in financial decision-making. Moreover, Belás *et al*. (2016) stated that knowledge of correct personal financial management leads to successful and improved quality of life.

It is important, not only to measure the degree of financial knowledge of the population, but also to identify demographic patterns, which allow to formulate adequate strategies (Klapper *et al.* 2013). O'Connor (2019) explored the interaction of demographics with consumer financial literacy. His results revealed that understanding of the nuances of financial literacy remains of great importance in ensuring consumer well-being. Lusardi and Tufano (2009) stated that financial illiteracy is more frequent in the case of elderly, young people and women. Bahovec *et al.* (2015) found that gender is statistically significant when analyzing levels of financial literacy. Also, Brown and Graf (2013) used multivariate analysis with a probit model to assess financial knowledge, inflation, interest rate and risk diversification. Their study concluded that women are 19% less likely to know all three questions compared to men. Sevim *et al.* (2012) concluded that financial literacy levels are statistically significant with respect to some demographic characteristics, such as gender, education, and marital status. For Cull and Whitton (2011), age and education are also significant variables that correlates to the degree of financial knowledge. Regarding marital status, Totenhagen *et al.* (2019) confirmed that sharing financial values with the partner, mediates the relationship between financial knowledge and relationship satisfaction, they concluded that financial knowledge is important for improving relationship satisfaction concurrently. Ivy *et al.* (2020) studied the common financial decisions that people face considering the most common mistakes and financial planning practices. All these variables play a fundamental role in household finances and are interrelated.

Another study conducted in several developing countries concludes that women have lower financial knowledge scores than men and part of the gender gap appears to be due to lower income levels of women, but the gender gap persists even when equal income groups were compared (Karakurum *et al.,* 2018). This trend is also confirmed in developed countries such as Spain, where the percentage of correct responses to a basic financial literacy test among women has a trend around 10 percentage points lower than the men's (Bank of Spain, 2016). In complementary studies, Chen *et al.* (2018) analyzed the gender gap in terms of financial knowledge and its relationship with loan performance.

Regarding income, Brown and Graf (2013) confirmed less financial knowledge in low-income population and immigrant families. On the other hand, Bahovec *et al.* (2015) confirmed that the difference in financial knowledge with respect to the level of household income is not statistically significant. Lusardi and Tufano (2009) analyzed a similar variable called debt literacy. They performed a logistic regression analysis to identify the level of debt literacy. As a finding, they identified age as a statistically significant variable, showing greater ignorance in the elderly age groups. They also found differences in gender, where women showed the lowest level of knowledge. This finding is consistent with Hung *et al.* (2012), who confirmed the gender gap in financial knowledge. Focusing on Latin America, a recent study of financial decisions and capacities in the Andean region concluded that financial literacy has a significant effect on informal savings and formal indebtedness of people (Roa *et al.*, 2019). With regard to gender in Latin America, in all countries analyzed in the survey to measure financial capacity in the Andean countries, the proportion of men who achieved a high score in financial knowledge is higher compared to women. In the case of Colombia, the high level of financial literacy was achieved by 48% of men and 38% of women (CAF, 2014). The population between 25 and 39 years old has a higher proportion of respondents who achieve a high score in the financial knowledge test, compared to all other age groups (CAF, 2014). Young households have less knowledge of the concept of power and inflation (Brown and Graf, 2013). The financial knowledge test, which has been used in different countries, analyzes the population's basic knowledge on three variables: inflation, interest rate and risk diversification.

In the research by Brown and Graf (2013) the authors highlighted that their study is internationally comparable since the level of financial knowledge is measured with comparable and consistent indicators. The same three variables were developed by Lusardi and Mitchell (2014) for United States, Alessie *et al.* (2011) for the Netherlands, Bucher-Koenen and Lusardi (2011) for Germany, Sekita (2011) for Japan, Agnew *et al.* (2013) for Australia, Crossan *et al.* (2011) for New Zealand, Brown and Graf (2013) for Switzerland, Fornero and Monticone (2011) for Italy, Almenberg and Säve-Söderbergh (2011) for Sweden, Arrondel *et al.* (2013) for France, Klapper and Panos (2011) for Russia and Beckman (2013) for Romania.

In the United States, only 30% of the American population answered the three questions correctly. Low levels of financial knowledge are frequent in other countries as well. The German and the Dutch population are more likely to answer the inflation question correctly compared to the Japanese (Lusardi and Mitchell, 2014).

Financial education will also help citizens to better understand public fiscal policies and to participate in their development to avoid fiscal crisis like the one Colombia faced in 2021. Although, this crisis was triggered by a string of reforms proposed by the government, it has created an opportunity to make citizens aware of the importance of political and financial knowledge. Higher levels of financial education will contribute to improve the financial performance of Colombian households and the economy of the country.

The series of reforms proposed by the Colombian government started in 2020 with Decree 1174, which constitutes a labor reform as it establishes the conditions for employers and workers who receive less than one monthly minimum wage. This decree made the hiring possibilities for employers more flexible but undermined benefits for employees. The government initiatives continued in 2021 with proposals to reform taxation, health and retirement. The initial tax reform proposed in 2021 sought to tax basic public services, to include people who earn more than 600 dollars per month (TRM May 2021: 3,715 COP) in the income statement, tax funeral services with VAT at a time when the country was facing more than 500 deaths a day due to the Covid-19 pandemic among the most outstanding measures. The health reform project promotes the regionalization of the Health System, transforming the current Health Provider Entities (EPS) and institutions such as hospitals to function in comprehensive service networks and manage an economy of scale, decentralizing processes and seeking regional autonomy based on greater resources from more affiliates.

Therefore, the main research question for this study is: What is the degree of financial knowledge of the population in Bogotá, Colombia in the searched period? To evaluate the research question, two hypotheses are proposed:

H1: There is a significant difference in the financial knowledge of people with different demographic characteristics (H1a=Age, H1b=Gender, H1c=Income, H1d=Marital Status).

H2: There is a significant difference in the financial knowledge of people with different educational characteristics?

The objective of this research is to identify the degree of financial knowledge of the population in Colombia, examining whether there is a significant difference in the financial knowledge of people with different demographic characteristics. (Age, Gender, Income, Marital Status, Education). The study also includes qualitative analysis by means of interviews, which allow us to assess current Colombian situation from the perspective of the financial knowledge. The main source of data is the Financial Burden and Financial Education Survey and the Large Integrated Household Survey (GEIH by its acronym in Spanish), both conducted by DANE - National Administrative Department of Statistics in Colombia, data compiled by the Government of Colombia. In this study, the econometric model based on the logistic regression is build and analyzed.

2. Methodological approach

This research is carried out using qualitative analysis of households' survey and interviews. The combination of quantitative and qualitative evaluation supports the results by the data triangulation.

We analyze data gathered from households in the urban area of Bogotá. This city is the financial capital of Colombia, the economic, political and administrative center of the country. Bogotá's GDP has a 26% share of national GDP and exceeds other countries in the region, such as Panama and Uruguay. More than 50% of the country's financial transactions are carried out in Bogotá.

Table 1. General information about Bogotá

Bogotá	
GDP 2018	USD 85,878 million
Population (Official Census, 2018)	7,181,469
Economic Growth 2018	3%
Share of the Population of Colombia	15%
Participation in Colombia's GDP	26%
Number of Companies	764,639

Source: DANE/Bogotá Como Vamos, (2019)

In Colombia there have been 12 tax reforms in the last 23 years; some of the most notable changes began in 1998 when the "2 per 1000" tax on financial transactions was created. This tax charges to users a rate of COP 2 for every COP 1000 in bank withdrawals. Initially, this tax was created temporarily for the economic emergency, however this tax is still in force today. In 2000, the tax increased to COP 3 per COP1000 and in 2003 the tax increased to COP 4 per COP 1000 on each transaction. Other significant change is the increase in Value Added Tax (VAT) and increases in income tax. See *Table 2* for details.

Table 2. Tax Reforms in Colombia

Year	Law	Description
1998	2330	This law created the temporary tax on financial transactions (COP 2 x COP 1000) during the economic emergency, and a tax on gasoline
2000	633	Tax on financial transactions (COP 3 x COP 1000)
2002	788	20% Cell phone services - temporary surcharge of 10% on rent
2003	863	Wealth tax and increase from (COP 3 x COP 1000) to (COP 4 x COP 1000)
2006	1111	16% VAT, 40% tax deduction for investments.
2009	1370	Increase in wealth tax. Income reduction for investments
2010	1430	This law eliminated the reduction in investment income and created the electricity surcharge in the industrial sector
2012	1607	This law created Income Tax
2014	1739	Wealth tax
2016	1819	VAT increased from 16% to 19%; prison for evasion
2018	1943	Financing Law: Gradual reduction of income tax, VAT discount
2019	2010	Growth Law: VAT refund to vulnerable households, three days without VAT per year

Source: Own elaboration with data from the Ministry of Finance and Public Credit Ministerio de Hacienda y Crédito Público, (2021) and Lozano, (2008) This tax reform proposal directly affected the middle class. Specifically, it is a reduction in the wage limit from which employees would have to pay income tax, the introduction of VAT on public services or the introduction of VAT on basic food items in the consumer basket. Although the State has defined some key food items that will not be affected by the reform, there is still increase or introduced VAT on some raw materials, which will make production more expensive and the tax will ultimately be paid by the final customer. On the contrary, large companies will retain tax benefits for instance free zones.

Regarding the demographic profile, Bogotá still has a lower population than New York and Tokyo censuses, but its growth rates have been higher since the 1950s. Both New York and Tokyo have been experiencing growth equal to or less than one percentage point since the 1990s, while the growth rate in Bogotá is still above that quota. Bogotá is in advanced stage of demographic transition, leading the whole nation. It has been developing rapidly, however, it has also presented a decrease in the growth rates of the population, generated by the decrease in mortality and fertility rates (Alcaldía de Bogotá, 2018).

Another major characteristic of Bogotá is its stratification system on a scale from 1 to 6. This system depends on physical characteristics of the house and its urban context, such as materials, access roads, gardens and garages. This classification does not rely on household income. Its main purpose is to collect differentially for home public services, assigning subsidies and collecting contributions (DANE, 2018).

The analyzed sample includes data from the GEIH and the Financial Burden and Financial Education Survey (Survey 2) developed by DANE. The first instrument mentioned is applied at the national level in urban and rural areas. It collects demographic, housing, education and workforce information. The approximate annual sample is 240,000 households. It is a survey whose sampling unit is made up of an average of 10 dwellings, including all households in each dwelling and each person in each household (DANE, 2015). Demographic and socioeconomic data are extracted from the General Characteristics module for the city of Bogotá considered as city #11 within the documents called "Area" in the GEIH. General characteristics, gender, age, marital status, educational level and income were considered and analyzed.

The second survey used arises from the question 15 of the GEIH, which uses as a filter question "Which of the following financial products do you or any household member currently use?" This question in the Survey of Financial Burden and Financial Education (DANE, 2017) is applied in an inter-institutional agreement with the Banco de La República since 2010 for the city of Bogotá and since 2017 also for Medellin and Cali.

The data analyzed in this study were collected in 2015 and describe the results obtained by the Survey of Financial Burden and Financial Education, made up to track the civil population residing in private homes in the urban area of Bogotá.

The unit of analysis is 18-year-olds and older in households that use some financial service. The sample design is probabilistic, stratified with an approximate sample of 9000 households (DANE, 2017). One of the chapters of the survey is on mortgage assets and debt, financial education, non-mortgage debt, financial and real assets, perception of the financial burden and credit restrictions.

2.1 Quantitative data

This study is based on exploratory, quantitative, and qualitative study design. The proposed econometric model is a logistic regression.

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \sum_{i=1}^{m} \beta_i X_i \quad (1)$$

This equation correlates financial knowledge with demographic profile of the surveyed households (see in section Logistic regression model). The financial knowledge variable is represented by a test designed by Lusardi & Mitchell (2014) that consists of assessing through three questions related to inflation, interest rate and risk diversification, the level of basic knowledge of households. The consistency of the model was tested and the p-value of the model and each question is less than 0.001 thus the model and its parts are statistically significant and usable for further analyses. The investigated questions are presented below. The questions used by DANE, are presented in *Table 3*.

Table 3. Questions used to define financial literacy

Variable	Question
Interest rate	You have COP 100,000 in a savings account, and the interest rate you earn is 2 percent per year. If you keep the money for 5 years in the account, how much will you have at the end of these 5 years? a. More than COP 102,000. b. Exactly COP 102,000. c. Less than COP 102,000.
Inflation	You have COP 100,000 in a savings account that yields 1 percent interest per year. You also know that the inflation rate is 2 percent per year. After a year, you will be able to buy: a. More than COP 100,000. b. Exactly COP 100,000. c. Less than COP 100,000.
Risk	Is the following sentence true or false? "Buying a share in a company is less risky than buying several shares in different companies with the same amount of money."

Source: Colombian Administrative Department of Statistics (DANE, by its acronym in Spanish, 2017)

Within the process of consolidating the database, the variables mentioned above from the general characteristics module are unified, extracting the demographic and socioeconomic information of the people registered in the Survey of Burden and Financial Education.

Due to the methodology employed by DANE, where the head of household answers questions about financial knowledge and those are loaded for all household members, only 6,713 out of the total sample of 18,411 responses are analyzed. This study works with cleared dataset only focusing on heads of the family who are the decision-makers in the financial areas in their household.

The first stage of processing the data focuses on the preparation of data matrix. The data are sorted and cleaned, and the quality checked. During this stage an analysis of missing values is conducted. Secondly, 213 empty records that do not contain answers to the questions are eliminated. Finally, the data matrix is transformed, and variables are coded for entering the statistical software for analyses. Before data processing, we test the data to make sure they fulfilled the conditions of further statistical testing (two-dimensional statistical methods and regression analysis).

2.2 Logistics regression model

The number of correct answers in the test represents the dependent variable. Within the first model, the variable is binary; equal to one if the individual has three correct answers, otherwise, it is zero (e.g., when a respondent answered all three questions correctly, he/she got 100 points). For the second model, the dependent variable represents the probability of obtaining at least two correct answers, or zero otherwise (e.g., when a respondent answered two questions correctly, he/she got 67 points). Gender, age, marital status, educational level, and income were defined as independent variables. *Table 4* presents this information.

Table 4. Variables of the model

Variable	Name	Description	Type
$x_{1,i}$	Gender	*0 male* *1 female*	categorical variable
$x_{2,i}$	Age	$18\ to\ 25\ years$ $26\ to\ 45\ years$ $46\ to\ 65\ years$ $over\ 66\ years$	categorical variable
$x_{3,i}$	Status (Marital Status)	Married Single Other	categorical variable
$x_{4,i}$	Education	None School University Postgraduate	categorical variable
$x_{5,i}$	Income	COP 0 to 5,000,000 5 to 8,000,000 Over 8,000,001	categorical variable

Source: *Authors*

The model is presented below:

$$Logit(pi) = \ln(\frac{pi}{1-pi}) = \beta_0 + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i} \tag{2}$$

$$\ln(\frac{p}{1-p}) = \beta_0 + \beta_1 \text{Gender} + \beta_2 \text{Age} + \beta_3 \text{Status} + \beta_4 \text{Education} + \beta_5 * \text{Income} \tag{3}$$

All studies use logistic regression as it is the best fitting method to evaluate demographic factors according to Klapper, Lusardi, & Panos (2013), Lea, Webley, & Walker (1995), Singh Thapa & Raj Nepal (2015), Barbic, Palic, & Bahovec (2016). On the other hand, Farias (2019) also used logistic regression in order to analyze the relationship between financial literacy and knowledge of personal loans considering similar demographic variables, such as gender, income, educational level and age.

2.3 Qualitative data and analysis

The qualitative data were gathered by telephone using semi-structured interviews. Each participant was contacted individually and his/her answers were recorded together with his/her subjective evaluation of current tax reforms. These questions are explained in *Table 5*.

Table 5. Interview questions used to define knowledge of reforms

Variable	Question
Current situation	Colombia is currently facing a difficult situation since its population does not agree with the proposed reforms. These include a change in tax, labor (Decree 1174 of 2020), health and retirement. With regard to the Tax Reform, do you know what are the main proposed changes and who will be impacted the most?
Interest rate	The country's indebtedness continues to grow and interest rates are decreasing. In August 2020, the Central Bank of Colombia lowered the monetary policy interest rate to a historic low of 2%, this is the sixth time it has lowered the rate consecutively. Do you know what effects or consequences this reduction can have?
Inflation	Is it possible that changes in taxes affect inflation?
Risk diversification	Regarding to the current situation of uncertainty, insecurity, violence, shortages, do you think that the possibility of selling your assets and / or withdrawing your current savings and investments in Colombia would be an action to diversify risk?
Impact of the reform	What role plays income inequality related to current discussion on tax reform, labor reform, health reform and retirement pension reform?

Source: Authors

A total of 45 interviews were conducted in May 2021 for individuals selected within each segment. The number of interviews is sufficient for systematic, structural sampling, according to Poynter (2012), Hodges (2011), Young (2014) and Disman (2018). The structure of the respondents was designed to match the data from DANE quantitative survey from 2015. The statistical description of the demographic characteristics is: gender: 53% male, 47% female; age: 18 to 25 years (15.6%), 26 to 45 years (44.4%), 46 to 65 years (22.2%) and over 66 years (17.8%). Education levels: no education (4.5%), school (13.3%), university (37,8%) and postgraduate (44.4%). Household´s income (in $ COP): $0 to $5,000,000 (68.8%), $5,000,001 to $8,000,000 (15.6%) and over $8,000,001 (15.6%) Marital status: married (26.7%), single (68.8%) and other (4.5%).

All qualitative data are analysed based on the transcript of answers. Responses are gathered by an in-depth, detailed study of individual responses resulting in a narrative description of financial literacy or experience with the nature of the proposed reforms.

The content analysis of the answers is conducted to assess knowledge of the proposed reforms and their impacts. To make replicable and valid outcomes from texts, we use categories based on the matter of the contexts and their use. The method clearly identified areas of text that are not clear in the responses at first. The steps of our quantitative content analysis reflect main steps according to Disman (2018). Firstly, all responses are read and elements which can be used as statistically usable variables are defined, e.g. words, phrases or parts of text with defined meaning which are repeatedly seen in the text. In the second step, all variables are classified into categories. Mostly nouns and its synonyms are used as categories. Synonyms are merged in one category. The qualitative categories form units for analysis. A unit is a word or phrase which is repeatedly used by respondents. The units and their context are analysed and attention is also paid to individual words. Logical clusters of units are recorded. Finally, 20 categories of qualitative variables are found and further use for analysis. Defined qualitative categories are listed in the *Table 6* below.

Table 6. Qualitative categories

Category of qualitative variables	Characteristics of category	No of occurrences
Inequality	inequality, (lack of or no) equity	36
Tax reform	tax, tax reform, VAT	78
Income	income, salary, purchasing power, money, expense, pesos, %	90
Middle class	middle class, average people	14
Lower class	poor, lower class, less favoured, poverty	37
Upper class	rich, wealthy minority, top class	13
Increase	increase, affect, distribution	86
Reform	change, reform, differ, difference	62
Beneficent	benefit, stability, balance	19
Government	government, state, politics, policy	26
Labour market	work, employee, employer, employment, job	18
Economics	economics, company, market, entrepreneur, sector	49
Problem	problem, risk, negative	22
Family	family, social	19
Payment	pay, payment	18

Source: Authors

This reduction of data and elimination of the less important variables highlight the most important information in responses. To create system for statistical analyses, the nominal quantification is used to monitor frequencies of occurrence of each unit or category. The final number of occurrences of each unit and category is loaded. The outputs from this analysis are further studied and statistically processed. The data are inserted in tables and descriptive and two-dimensional statistical tests run to evaluate the results. The occurrence of characteristics in case of high-level financial literacy compare to low levels is tested. High awareness and financial literacy is coded as 1, low or no level of knowledge or not relevant answers were coded as 0. The coded answers are used for statistical analyses.

The respondents' answers are categorized according to the identification questions (e.g., gender, age, marital status, income and education) which formed independent variables.

Finally, the data are further analyzed by means of a one-dimensional analysis based on the frequency distribution then a two-dimensional analysis of the dependence of selected variables by testing the hypotheses stated based on the theoretical background and starting points. The hypotheses are tested to establish whether there is a difference between defined groups of respondents and their financial literacy e.g. knowledge about nature of the reforms. The goal is to identify which characteristics play an important role in financial literacy. The null hypothesis is rejected in case the p–value calculated by means of the test is lower than the selected level of significance $\alpha = 0.05$.

3. Conducting research and results

This chapter analyzes and presents outputs from the analysis of data from questions related to the financial literacy of respondents representing households and using financial services in Bogotá. Descriptive statistics and two-dimensional methods were used to evaluate the primary data gathered from the survey in 2015 (for tested questions see *Table 3*) and interviews in 2021 (for tested questions see *Table 5*). Examination of respondents' characteristics was conducted to identify differences among groups that forms the base of financial literacy within the population and current society. Specific results impacting financial education and its development are further discussed. The results show current approaches towards financial competency development in developing economy.

The overall results show that out of three questions on financial literacy 3,423 respondents answered two correctly (51% of the sample) and 1,025 respondents answered all three questions correctly (15% of the sample).

The most important characteristics and results according to the demographic groupings are presented in Table 7. The financial literacy levels are presented according to gender, age, education, income and marital status. The results are statistically processed and results further discussed below. Because the p-value of the model is less than 0.001 thus the model is significant and usable for further analyses. The p-value of each of the tested question is statistically significant (p<0.001) as listed in the *Table 7*.

The overall Omnibus test with a chi-square result shows that the model as a whole is significant (p= 0.000). Nagelkerke test R2=0.028 (Step 3), which shows a weak dependence. The Hosmer Lemeshow test p-value is 0.370, which signals the consistency of the model and data.

Table 7. Levels of financial literacy

		Fin. literacy levels – survey			p-value survey results (consistency test)	p-value interview results (hypotheses testing)
		High%	Medium%	Low%		
Gender	Male	15.9%	65.8%	18.3%	<0.001	<0.001
	Female	14.1%	64.5%	21.4%		
Age	18 to 25 years	15.5%	66.3%	18.2%	<0.001	<0.01
	26 to 45 years	17.0%	64.9%	18.0%		
	46 to 65 years	14.8%	67.0%	18.2%		
	Over 66 years	11.4%	61.3%	27.3%		
Education	None	13.0%	60.0%	27.0%	<0.001	<0.001
	School	15.7%	65.8%	18.6%		
	University	19.5%	69.0%	11.5%		
	Postgraduate	26.2%	67.1%	6.7%		
Income (COP)	0 to 5,000,000	14.8%	65.3%	19.9%		<0.001
	5 to 8,000,000	27.2%	64.6%	8.2%	<0.001	
	>8,000,001	28.4%	63.0%	8.6%		
Marital Status	Married	17.5%	66.5%	15.9%	<0.001	<0.01
	Single	16.5%	66.3%	17.1%		
	Other	13.9%	64.5%	21.7%		

Source: Own elaboration with DANE data

Note: High level of financial literacy = 3 correct answers; Medium level = 2 or 1 correct answer; Low level of financial literacy = no correct answers or refused to answer

As the results show in the *Table 7*, men have slightly higher percentage of high and medium financial literacy, but the values are very similar. This was confirmed by analyses, the gender does show significant results in two-correct answers model only on level 0.05, but no significant difference was found in case of model with all correct answers. This result meets expectations but as based on other studies we expected greater differences among gender. But as our sample contains only respondents who make financial decisions and are head of households, the results are slightly different. Analysis of interviews shown the same results. Men were usually more well-aware of the situation, e.g.: *"Increasing the ceilings to declare* *income, placing taxes on more items of the family and other services makes the middle class, which has been hit hard by the pandemic, the most affected. The SME Entrepreneur and the employee are greatly affected, not only in their companies but also in their homes, and the effect may be to continue reducing their ability to save and worsening their quality of life.*" On the other hand, some women were not so sure, even though holding university degree: "*No, I only know that the tax reform was going to expand the population that would pay income taxes and the new products and services that would have new or more taxes*."

Regarding age groups, the highest financial literacy can be found in the mid-age group. The lowest literacy and threatened group is among elderly people over 66 years. Similarly, the financial literacy and awareness is rising together with education. The higher the degree an individual obtain, the better financial literacy is observed. The same result was found within the income levels. The higher salary means also higher awareness in financial decision-making. In case of marital status, married individuals performed the best in the test. Accordingly, qualitative analysis of interviews confirmed these results. Mid-age group and people with higher education or higher salary provided correct, comprehensive and more complex answers. I.e. description of phenomena by mid age group is characterized by: "*The reforms seek to lower current inequality. However, precisely the argument of those who oppose them is that they do not completely solve the issue of inequality. Currently, the Gini before and after taxes does not vary much so these are not having the effect of leveling the playing field for the entire population. Regarding pensions, the current system leaves out the poorest and subsidizes those with the highest income. For these reasons, reforms can help if it is understood that despite having shortcomings, they represent an improvement compared to the status quo."* E.g. answers provided by respondents over 66 years were typically: "*Lack of equity in people's salaries*."

To evaluate the results of regression analysis, two regression models were conducted (see resultant tables attached and Methods for details on models). Both models were compared to find differences among financial literacy of respondents. Also, both models are statistically significant ($p<0.001$). Firstly, the model for two correct answers was created. In this model, it is possible to find significant impact of education (university 0.734, $p<0001$) and age (up to 65 years, $p<0.05$) on financial literacy. In case of two correct answers, also technical education plays a significant role in improvement of financial literacy (0.658; $p>0.001$). There is slightly better performance in financial test in case of married respondents (0.164, $p<0.05$).

Results of model on higher levels of financial literacy (three correct answers) showed no differences among gender, although married respondents performed slightly better (0.186, $p<0.05$). Education proved to be essential, as the levels of financial literacy increased with higher level of education (always $p<0.001$). Further, university and graduate education explains the most the dependent variable (0.641 in university education; 0.890 in case of postgraduate, both $p<0.001$). Mid-age group (26 to 45 years old) obtained the best results (0.289, $p<0.05$). Based on both models, education plays a crucial role in financial literacy. To improve level of education of the population is therefore suggested.

Testing the hypotheses, the following results were observed. The output data show that age groups significantly differ (H1a was confirmed). Older age groups over 66 years old and more performed worse in the test (see *Table 1* and confirmed by regression models). The preposition of less knowledge involving people and older adults was confirmed. The highest score in the test was found within the mid-age group, compared to younger and older age groups. There is a significant difference in the financial knowledge and age. The testing revealed that there is no difference between gender in the investigated group (H1b was refused in the case of three correct answers model where slight differences were found in the case of medium financial literacy). Also, higher salary leads to better performance in financial literacy tests and groups with different income statistically significantly differ (H1c was confirmed).

Regarding marital status (H1d), married population on average achieved better results in the test shown in *Table 1* compared to the single or other marital status in population. The difference is statistically significant. For divorced people income is an important determinant. On average, married people have higher financial literacy than singles, which also correlated with age.

When evaluating H2, the results show that any education, even general education is better than none. No significant differences were found between lower levels of education. High school graduates are more likely to answer the test correctly compared to those with general education or none. On average, university students perform significantly better than other investigated groups. The university degree makes significant difference in the results on financial knowledge. Moreover, graduate students also achieved better results than undergraduate students and other respondents. Results confirm that β will grow as the person acquires knowledge and increases his/her level of education.

Based on content analysis of qualitative data, overall 72% of respondents shown awareness of the financial impacts of tax and other reforms. People are mostly well informed. The lack of information was shown in half of low educated respondents. Among other groups, respondents were reaching over 50% of knowledge in all questions. Surprisingly, we found that people over 66 years are mostly seeing inequality as the source of protests (during demonstrations).

Through the interviews (see *Table 4*), people were mostly focusing on areas such as changes in income (90 occurrences), inequality (36 occurrences), increase (of taxes, prices, inflation) mentioned by 62 respondents, impact on lower class (above all other classes) mentioned by 37 respondents, role of the government was mentioned by 26 respondents, impact on families by 19 respondents and necessary changes or impacts on economy was discussed by 45 respondents. The results are pointing at the most related areas in the eyes of respondents from Bogotá. Their financial literacy was proven also in practice when searching the theme of tax (and other) reform.

4. Discussion

In this study, the influence of variables such as educational level and age is evidenced as determining factors of the level of financial knowledge. Singh and Raj (2015) observed the same findings, with their study that included demographic variables such as gender, income, age, education and their attitude towards finances. Floyd (2015) reached a similar conclusion with a study comparing the student population. Both studies concluded that that age and educational level are significant variables that explain the degree of financial knowledge.

Since economic growth is dependent on the wealth and financial literacy of households and represents the foundation stone of the whole society, the financial literacy possibilities represent the most important factor and predictor of the development of the depths in the searched economy.

According to our findings, there were statistically significant differences in gender in the model of two correct answers. Men have higher probability to select two correct answers. The model with three correct answers did not show this difference. On the other hand, results by Fornero and Monticone (2011) and Lusardi and Mitchell (2007) and other studies mostly confirm the gender gap. The difference in this study is that we analyzed only heads of households who make financial decisions. Furthermore, the difference is getting lower with university education and disappears in case of graduate and postgraduate level of education. It is possible to affirm that education is the greatest determinant of literacy which was confirmed also by field research conducted to map financial awareness in practice interviewing people in the middle of demonstrations against the proposed reforms.

Greater knowledge of financial management and financial products were found in the mid-age group, which is also confirmed by Brown and Graf (2013). At the family level, one of the studies indicated that spouses in households acquire financial knowledge and are nourished by tools for the better management of resources over time (Hsu, 2011). This was confirmed also in this paper. Similarly, Kadoya and Khan (2019) state that spousal's education is positively related to financial literacy, suggesting that better educated spouses help their counterparts to achieve greater financial knowledge.

The results also showed that women increase their financial literacy after they go through some unusual situation, such as a separation or death of a spouse, which is in line with results by Hsu (2011). Regarding education level, we found significant dependence between level of education and financial literacy. The literacy and ability to manage finances is better with higher level of education. Each level of education significantly differs from the lower level in the ability to answer the questions on interest rates, inflation and risk. On average, university students perform better than other groups in this test with results consistent with (Atkinson and Messy, 2012, Fornero and Monticone, 2011 and Lusardi *et al.*, 2013). These results are supported by the CAF report, which also shows a positive relationship between financial literacy and the educational level of individuals (CAF, 2014).

Conclusion

This study investigates financial literacy and factors affecting financial decisions of households in Bogotá, Colombia. The results confirm that financial literacy differs significantly among age groups. In particular, elderly population is less familiar with the concepts of financial management and financial decision-making. The proposition of less knowledge within young people and older adults was confirmed, but results show that younger educated individuals (students and those with technical education) have significantly higher knowledge than the elderly (66+).

Most importantly, these results depict the real lives of people in Bogotá. Based on results of interviews conducted in reaction on financial and social reforms in Colombia in 2020-2021, it was found the financial knowledge significantly impacting people's awareness of decisions through crisis. The level of education was proven as the crucial factor. The mid-age group, especially men are able to process and be well aware of the situation and gain relevant information the best.

The hypotheses were evaluated as follows: There is a significant difference in the financial knowledge of people of different age (H1a was confirmed, as there are differences between mid-age group, who rated higher in financial knowledge among younger and especially older age groups). On the other hand, there seems not to be significant differences among gender (H1b was confirmed but although there are some differences, those are not statistically significant in model with all correct answers); this may be because of rising number of single (or divorced/widowed) women who needs to have financial knowledge and be able to make decisions. Furthermore, higher income leads to better performance on financial literacy tests (H1c was confirmed). Marital status significantly affects level of financial literacy (H1d confirmed, but results show only low impact of marital status on financial literacy). In addition, the level of education significantly affects the financial knowledge and management, as expected based on other studies (H2 was confirmed). The level of education is the highest predictor of correct financial decisions among all other variables.

Based on the results of this study, it is possible to recommend the support of financial education at all levels. Especially university education, which shows significant differences among results and leads to high financial literacy. Also, life-experience plays an important role and people who have to live on their own also need to raise the level of their financial knowledge. It is related also to current trend of smaller households run by people with higher or university education who are aware of their expenses, investments and finances in general.

A limitation of this study is a narrow focus on households in one city. However, the results are representative and presented as a case study supported by qualitative research, and these findings may help other researches in an increasingly discussed area, especially due to the economic impacts on households and financial reforms in Latin America. Furthermore, this article provides an insight into the importance of financial education, its monitoring and implementation of continuous improvement based on feedback loop. This study is bringing important insight into Latin America financial literacy as there are lack of studies focusing on those emerging economies in South America.

Promising avenues for further research are areas measuring the impact of financial education on economic performance. Additionally, revealed factors may be surveyed separately to validate their impact on quality of teaching-learning process in educational institutions and further differences in approaches to learning process.

Acknowledgement

We express our gratitude to the AUIP – Asociación Universitaria Iberoamericana de Postgrado, Universidad EAN and Universidad Pablo de Olavide for supporting this research.

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Model 1. Two correct answers

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Woman	-.165	.064	6.693	1	.010	.848	.749	.961
	Married	.164	.069	5.663	1	.017	1.178	1.029	1.349
	Divorced	.071	.079	.791	1	.374	1.073	.919	1.254
	Widow	.016	.118	.018	1	.893	1.016	.806	1.281
	Single	.113	.090	1.578	1	.209	1.120	.938	1.337
	No education	.110	.193	.323	1	.570	1.116	.764	1.629
	Basic	.369	.063	34.051	1	.000	1.446	1.277	1.636
	Technic	.658	.085	59.723	1	.000	1.932	1.635	2.283
	Univer	.734	.098	55.650	1	.000	2.083	1.718	2.526
	Gradua	.679	.130	27.477	1	.000	1.972	1.530	2.541
	E18a25	.273	.137	3.964	1	.046	1.314	1.004	1.718
	E26a45	.178	.087	4.151	1	.042	1.195	1.007	1.418
	E46a65	.245	.082	8.993	1	.003	1.277	1.089	1.499
	Income	.000	.000	11.681	1	.001	1.000	1.000	1.000
	Constant	-.598	.093	41.623	1	.000	.550		

a. Variable(s) entered on step 1: WOMAN, MARRIED, DIVORCED, WIDOW, SINGLE, NO EDU, BASIC, TECHNIC, UNIVER, GRADUA, E18a25, E26a45, E46a65, INCOME.

Model 2. Three correct answers

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Woman	-.058	.088	.429	1	.512	.944	.795	1.121
	Married	.186	.094	3.939	1	.047	1.204	1.002	1.447
	Divorced	-.010	.112	.007	1	.932	.990	.795	1.233
	Widow	-.034	.178	.037	1	.847	.966	.682	1.369
	Single	.012	.122	.009	1	.923	1.012	.796	1.286
	No Edu	.208	.286	.530	1	.467	1.231	.703	2.155
	Basic	.390	.093	17.526	1	.000	1.476	1.230	1.772
	Technic	.575	.115	24.949	1	.000	1.778	1.418	2.228
	Univer	.641	.128	25.267	1	.000	1.899	1.479	2.438
	Gradua	.890	.155	32.777	1	.000	2.435	1.796	3.303
	E18a25	.242	.194	1.563	1	.211	1.274	.872	1.862
	E26a45	.289	.128	5.137	1	.023	1.335	1.040	1.715
	E46a65	.181	.122	2.205	1	.138	1.199	.944	1.523
	Income	.000	.000	3.453	1	.063	1.000	1.000	1.000
	Constant	-2.394	.138	302.252	1	.000	.091		

a. Variable(s) entered on step 1: WOMAN, MARRIED, DIVORCED, WIDOW, SINGLE, NO EDU, BASIC, TECHNIC, UNIVER, GRADUA, E18a25, E26a45, E46a65, INCOME.