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FINANCIAL LITERACY AND RETIREMENT PREPARATION IN LA PAZ, BOLIVIA

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Dissertation presented as a partial requirement for obtaining
the Master's degree in Statistics and Information
Management with a specialization in Risk Analysis and
Management

NOVA Information Management School
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by

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Abstract

In the last two decades, it has been seen the need to study the Retirement Preparation of the populations in different countries of the world, this due to a population with a greater Life Expectancy and invested population pyramids in which pension funds have been large financial difficulties to cover retiree pensions. This generates not only problems for those who had the contributions in the pension funds, but also for the families that have to bear the financial burden of the elderly members of the family, in case the pension is not enough for a good quality of life, or simply when the person does not have any income when reaching elderly stage.

This research aims to study the relationship and the impact in Financial Literacy as a way in which individuals plan their retirements in the city of La Paz, located in Bolivia. The case of Bolivia is even more complex as the demographic characteristics are not like those of the developed countries. Only 30% of the population has social security coverage when they reach adulthood, and most of the remaining 70% are dependent on their relatives or the family business and, in the worst cases, live in poverty. It is worth to mention that even though the system covers 30% of the population, the replacement ratio is low. That is why it is of utmost importance to carry out studies in the area to be able to direct and design public policies which can address these problems and benefit all citizens.

For this research, a probit regression model was used to primarily explore the influence of Financial Literacy on the way individuals plan their retirement, but also to explore the impact of a number of socio-demographic variables on retirement planning.

Among the main findings, a positive relationship was obtained between financial literacy and Retirement Planning, that men have better Retirement Planning than women, that self-employed have better financial planning through long-term than those who are dependent workers and that minorities are a vulnerable sector of the population in terms of retirement planning.

Being an exploratory study, this study can be used as a basis to continue studying the Retirement Preparation of the population of the city of La Paz, as well as at the national level, this because its findings can be very helpful for the political / economic decisions of the Bolivian rulers, having a population that does not participate in the formal market and that urgently needs a change in order to guarantee the well-being of its population when they reach adulthood.

Keywords

Retirement, Financial Literacy, Pension System, Informal Economy, Financial inclusion.

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1. INTRODUCTION

During the last years, a great interest has been awakened to understand the financial behavior of individuals, not only in the present but how these individuals prepare for the future since it has a strong consequence on the economic policies of a state and its future planning. There are several studies on how Financial Education affects people's behavior in terms of savings, access, and use of financial products, Retirement Planning, and tax planning, among others, in both developed and developing countries. For example: Financial Literacy and Retirement Preparation in the Netherlands, by Rob Alessie, Maarten van Rooij and Annamaria Lusardi; Financial literacy and Retirement Preparation in China, by Geng Niua , Yang Zhoub and Hongwu Gan, and, in the case of emerging countries, Financial literacy and financial planning: Evidence from India, by Sumit Agarwal, Gene Amromin, ItzhakBen-David, Souphala Chomsisengphet, and Douglas D.Evanoff.

In developing economies, financial education has been studied and a close relationship has been found between financial education and its effect on economic stability, equity, and poverty reduction. However, little is known about how financial literacy affects the way individuals plan for their retirement, whether formally or informally. Retirement planning is of great importance to the people and the economy worldwide. Empirical data shows that many individuals are not able to manage their finances when they become old, especially those who did not plan their retirement in advance, either with a state entity, with a private company, or independently.

The relationship between Financial Literacy and Retirement Preparation is currently being studied in many countries since it is of great importance in evaluating the economic policies of governments and Pension Funds planning. However, most of the countries that are studying this are developed countries. How this relationship establishes in a developing country is still an open research question. When we mix many more variables that affect Retirement Planning, in much more informal economies and with strong inequality problems, how does Financial Literacy affect Retirement Preparation? This research aims to contribute with the theoretical bases to establish this relationship and to serve as a guide for future research on Retirement Preparation directly related to other variables.

This dissertation will be divided into 5 different sections, in the first will contain the background and problem identification and the study importance; the second section will establish the

theoretical bases of the investigation, the third section will contain the methodology, in the fourth section, will be developed a probit regression model to find the relationship between Financial Literacy and Retirement Preparation to finally reach the fifth section that will show the conclusions and recommendations of the study.

1.1 BACKGROUND AND PROBLEM IDENTIFICATION

The Retirement Planning System is undergoing massive challenges around the world. Developed countries usually experience problems with the increased life expectancy of individuals, while developing countries, with more informal economies, are not able to provide retirement plans that meet the demands of their populations. Because of these problems, individuals are expected to bear the brunt of their financial well-being when they become elderly. In this context, it has been found in developed countries that there is an existing relationship between Financial Literacy and the way individuals prepare for retirement. However, little is known about this relationship in developed countries. (Geng Niua, 2020)

The main problem that developed countries are experiencing regarding retirement plans is the inversion of their population pyramids. People are living longer and deciding to have fewer children (or none at all), the fertility rate reached 1.55 children per woman in Europe (Eurostat, 2018) and 2.1 in Latin America by 2018, This situation leads to fewer taxpayers and fewer contributions to pension plans that can cause a failure in the system leading to Pension Plan administrators creating policies which link life expectancy to the contributions and also increase the requirements for people to access to a retirement plan.

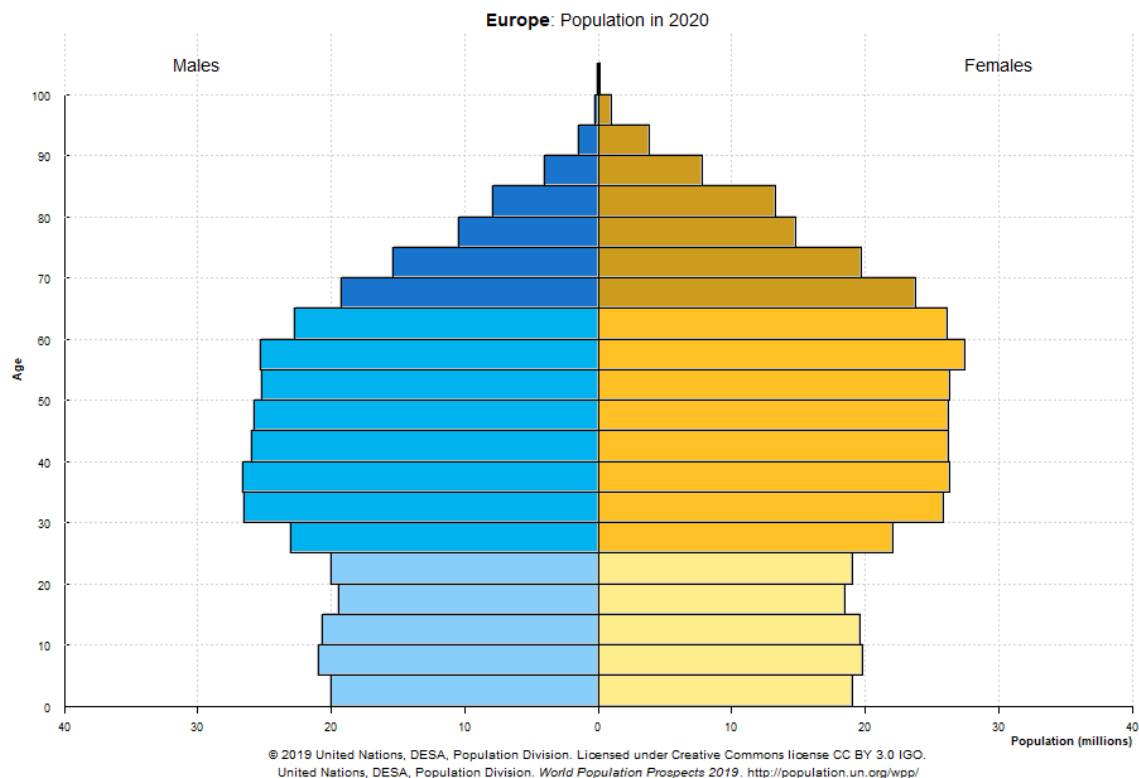
To reduce or eliminate the short- and long-term solvency concerns in retirement income schemes created by continuous life expectancy increases, an upward trend in old-age dependency ratios, and insufficient economic growth, in recent decades most countries have responded with parametric (e.g., increasing the retirement age) or structural pension reforms, including the switch from pay-as-you-go (PAYG) defined benefit (DB) plans towards mandatory fully-funded defined-contribution plans (e.g., the 1981 reform in Chile), the introduction of individual complementary funded accounts (e.g., Romania, Hungary, Poland, China), the transition from classic DB PAYG plans towards Non-Financial Defined Contribution (NDC) schemes (e.g., Sweden, Italy, Latvia) and reforming pensions taxation (OECD, 2019; Bravo & Herce, 2020; Bravo, 2016).

Another major pension reform trend has been to link earnings-related pension benefits to life expectancy developments. For instance, several countries (e.g., The Netherlands, Slovakia, Denmark, Portugal) automatically indexed their normal and early retirement ages to period life expectancy observed at retirement (Ayuso et al., 2021a,b; Bravo & Ayuso, 2020, 2021). Others have opted to link the first pension benefit to demographic or sustainability factors (e.g., Finland,

Portugal) or to transformation (annuity) factors (e.g., Italy, Norway). In France and Italy, the eligibility requirements for a full pension now depend on the number of contribution years linked to longevity trends. Private (and public) retirement income schemes introduced longevity-linked life annuities which differ from the traditional level or inflation-linked annuities in that benefits depend on the dynamics of actual against forecasted survival probabilities (Alho et al., 2013; Bravo & El Mekkaoui, 2018; Bravo, 2019, 2020, 2021). These reforms transfer longevity, interest rate, and economic risk to pensioners and policyholders increasing the importance of retirement planning in reducing old-age poverty.

Figure 1 shows the population pyramid of Europe. The bulk of the population is of working age and there is a substantial amount of retired people.

Figure 1 Population pyramid Europe - 2020



Source: ***United Nations, Department of Economic and Social Affairs, Population Division (2020)

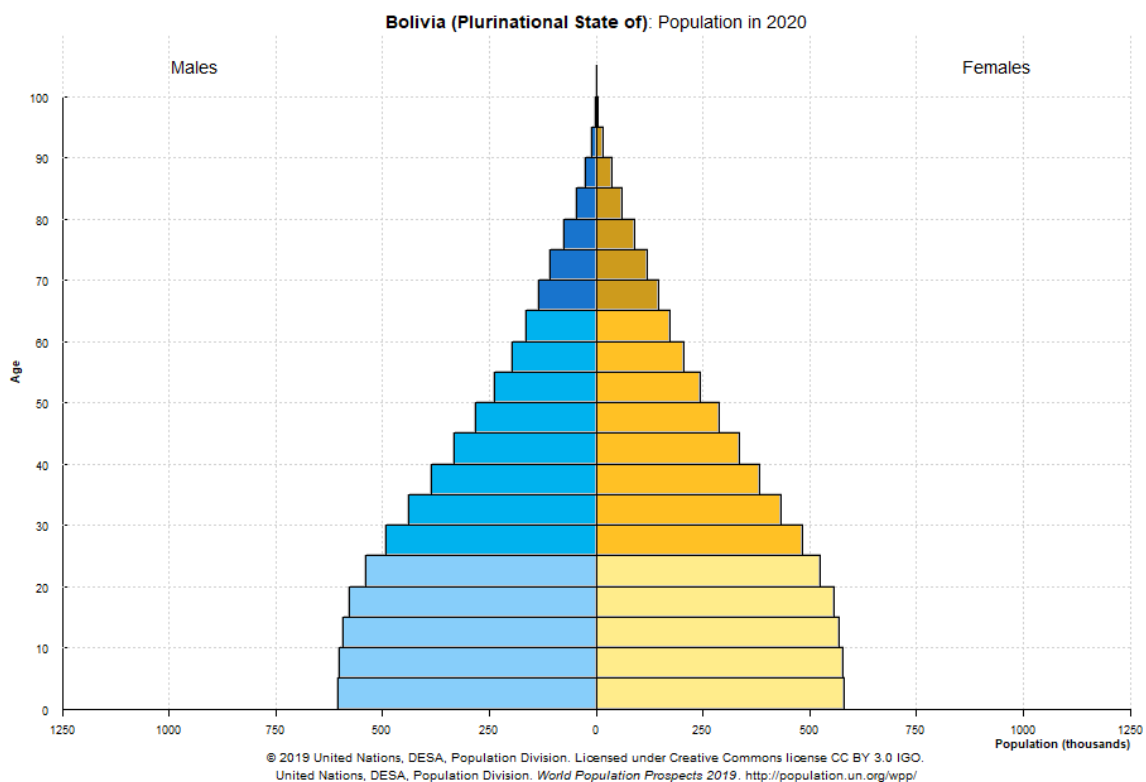
Retrieved from: <https://population.un.org/>

Besides Latin America has lower statistics regarding fertility rates, it's important to mention that it has a great amount of teenage pregnancy (Agencia EFE, 2018), which shows the problems that the region is facing with family planning, but also can lead us to the question: in which way

teenage pregnancy affects the economy of the families and the way the individuals plan their retirements?

The demographic make-up of the population poses a challenge to pension plans not only in developed countries but also in developing ones. In Latin America, some countries are experiencing changes to their population pyramids. However, is not the case of Bolivia, which is located at the top three countries in Latin America, America with a fertility rate of 2.9 children per woman, after Guatemala (3.0) and Haiti (2.9) (Agencia EFE, 2018). The population pyramid below shows that Bolivia is a country with many young people (figure 2).

Figure 2 Population pyramid of Bolivia - 2020



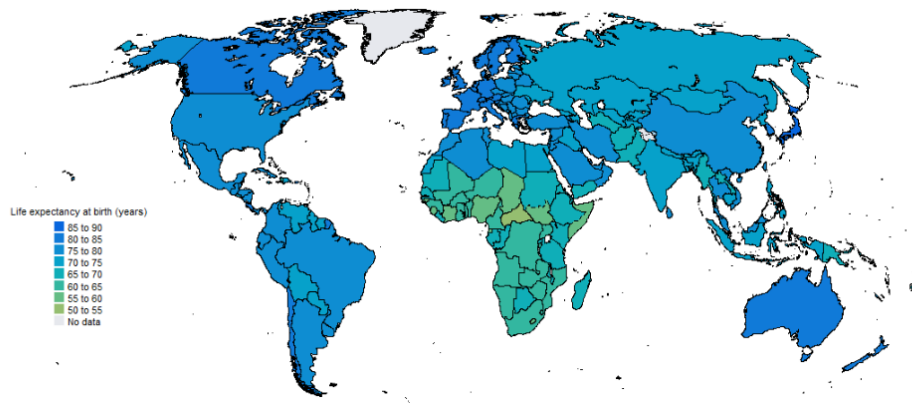
Source: ***United Nations, Department of Economic and Social Affairs, Population Division (2020).

Retrieved from: <https://population.un.org/>

Another key demographic indicator is life expectancy. Bolivia's life expectancy has increased over the years, although not as much as neighboring countries. In Latin America, Bolivia lags behind the rest of its peers, except Venezuela and Paraguay.

Figure 3 World life expectancy at birth, 2020-2025

Life expectancy at birth, both sexes, 2020-2025 (medium-variant projection)



Source: United Nations, Department of Economic and Social Affairs, Population Division (2020).

Table 1 compares life expectancy numbers between Latin American and Europe. Although the numbers are not quite high in Latin America, they have been increasing over the last decades.

Table 1 Life expectancy: Latin America vs. Europe

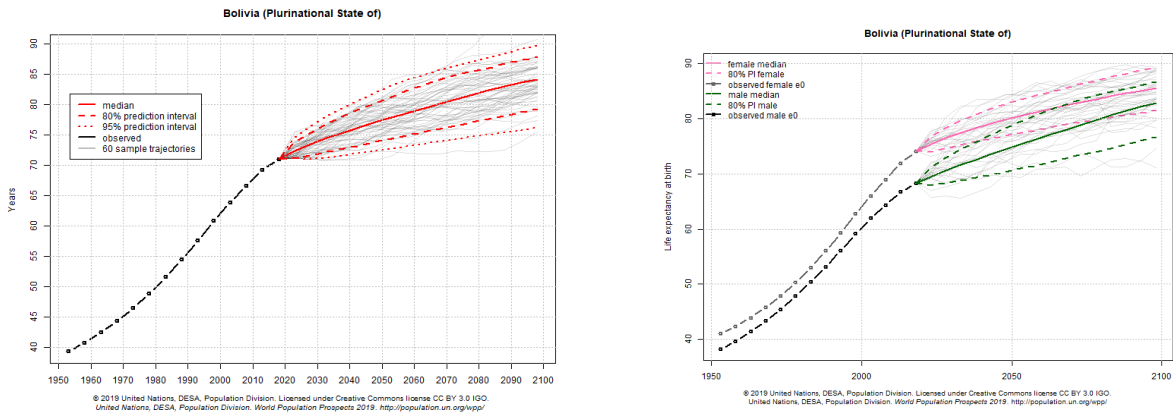
Life Expectancy							
Latin America				Europe			
Country	Life Expectancy	Region Rank	World Rank	Country	Life Expectancy	Region Rank	World Rank
Costa Rica	79.57	1	29	Switzerland	83.26	1	2
Chile	79.52	2	30	Spain	83.08	2	3
Panama	78.03	3	38	France	82.95	3	5
Uruguay	77.06	4	44	Italy	82.77	4	8
Argentina	76.95	5	46	Norway	82.48	5	10
Ecuador	76.47	6	49	Luxembourg	82.4	6	11
Peru	75.86	7	62	Iceland	82.4	7	12
Nicaragua	75.49	8	68	Sweden	82.36	8	13
Honduras	75.17	9	73	Austria	81.87	9	16
Brazil	75.14	10	74	Netherlands	81.63	10	17
Colombia	75.11	11	75	Ireland	81.54	11	18
Paraguay	74.19	12	86	Portugal	81.53	12	19
Venezuela	74.05	13	88	Malta	81.5	13	20
El Salvador	73.68	14	89	Finland	81.45	14	21
Guatemala	73.23	15	94	United Kingdom	81.43	15	22
Suriname	71.81	16	107	Denmark	81.25	16	23
Bolivia	71.5	17	108	Belgium	81.16	17	24
Belize	70.45	18	116	Greece	81.16	18	25
Guyana	66.19	19	135	Germany	81	19	26

Source: Own Elaboration based on data of World life Expectancy (2020)

Web page: <https://www.worldlifeexpectancy.com/> Date of consultation: 09/06/2020

In table 1, Bolivia locates at the bottom of the Latin American ranking; however, during the last decades, Bolivia increased its life expectancy from 65.7 in 2000 to 71.5 in 2020 (Expansion, 2018). Figure 4 shows the historical increase in life expectancy in Bolivia, which will continue to grow in the years to come. We note also that women live more than men on average.

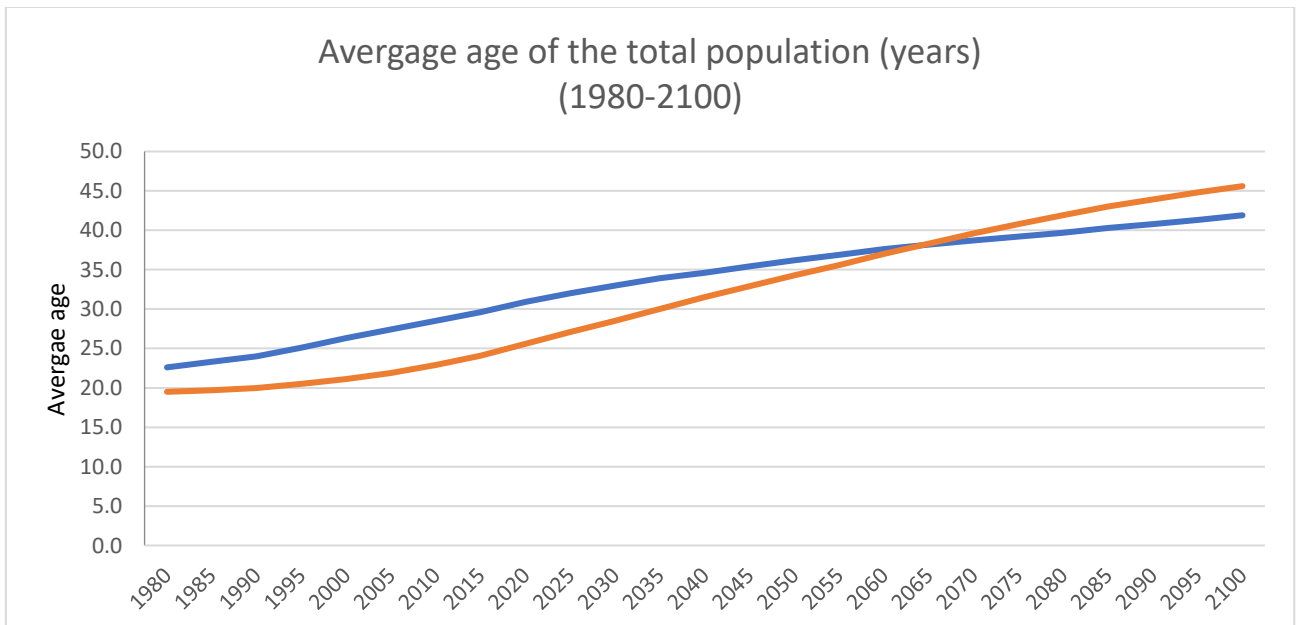
Figure 4 Projected Life Expectancy in Bolivia



Source: United Nations, Department of Economic and Social Affairs, Population Division (2020).

The median age of the total world population versus Bolivia, where we can see a consistent increase of the population median age in Bolivia, which means that the population is expected to be older than in the past, and older than the world average.

Figure 5 Median Age of the Total population (1980-2100) World vs Bolivia

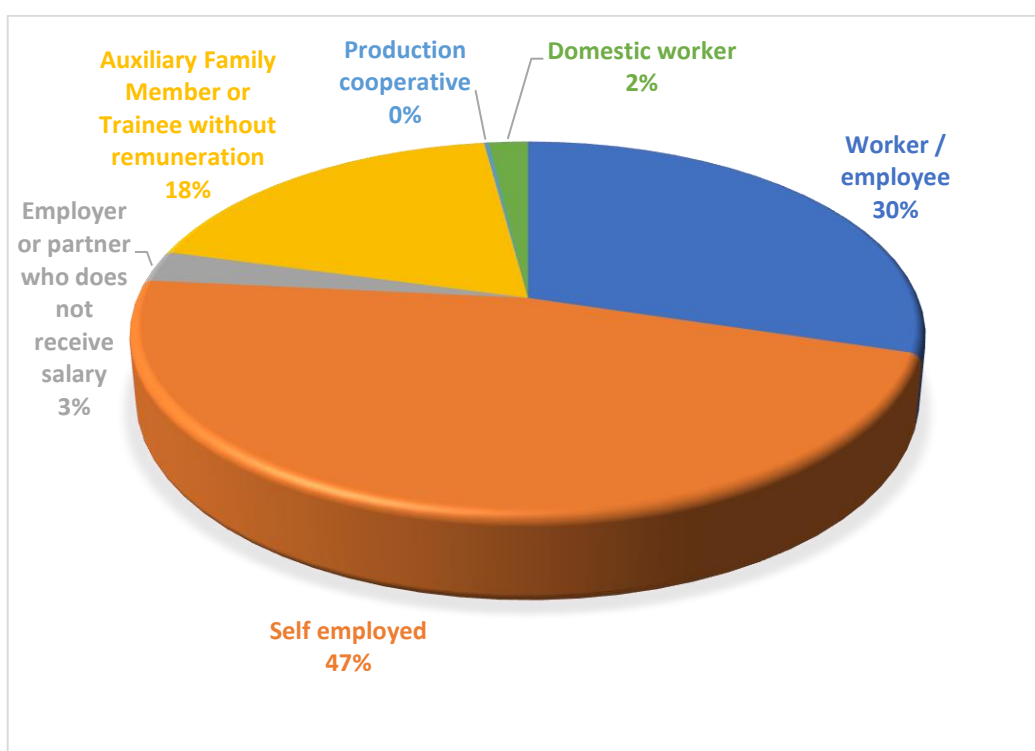


Source: Own elaboration based on data of Department of Economic and Social Affairs, Population Division – United Nations (2020).

As observed in the previous data, Bolivia is not facing serious demographic problems that can potentially affect the pension plan or retirement compared with other countries around the world; but what other variables can affect the Retirement Preparation in Bolivia?

A characteristic of Latin American countries is the importance of the informal economy. Bolivia is among the leaders of the sub-continent in having an informal economy. Only a third of the Bolivian population of working age belongs to the formal sector, so only that third would be forced to make contributions to the pension funds. Figure 6 shows us the structure of the working-age population in Bolivia by March 2020.

Figure 6 - Bolivia: Percentage Distribution of the working-aged population – March 2020

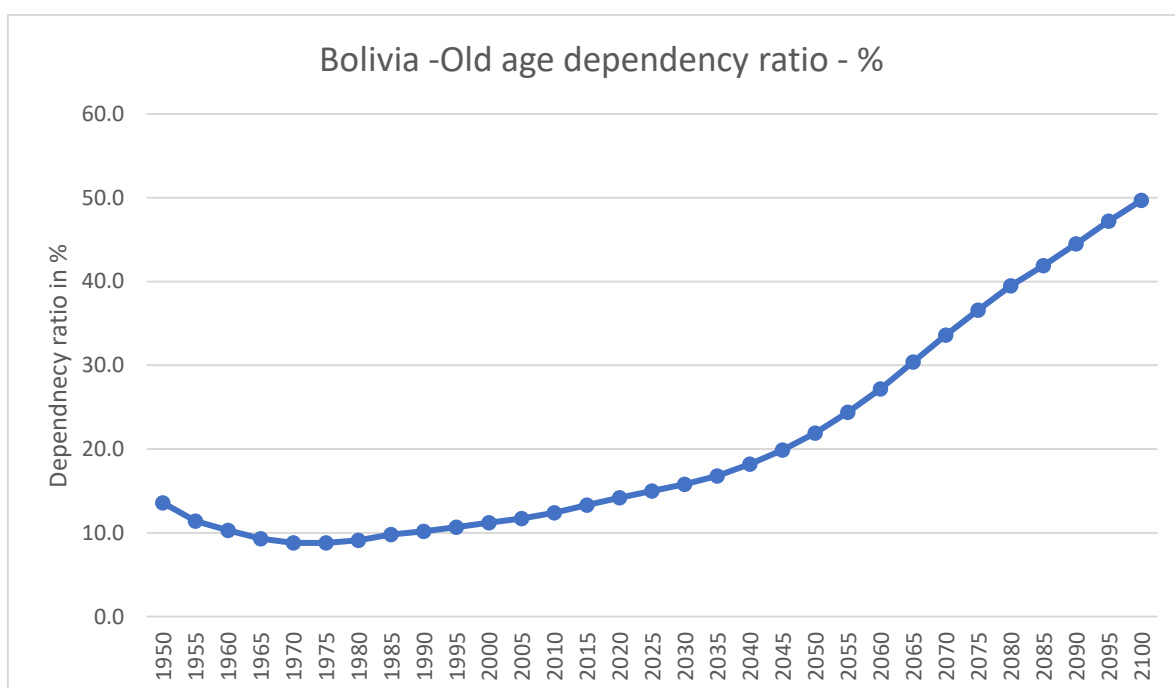


Source: Own elaboration based on data of the Statistics National Institute – Bolivia (2020)

It is worth mentioning that within this distribution it can vary according to seasonal employment and that people who find themselves within the category of self-employed may camouflage people who are dedicated to smuggling and who have very high incomes. Most of the population that forms part of the informal sector is outside of any Social Security benefit, be it short or long term. so how do these people plan their retirement?

Since the majority of the population is dedicated to informal trade or micro/medium businesses, which are mostly businesses in which capital rotates daily and there is no long-term financial planning, this is why this population remains exposed when she becomes an old woman, because she does not have any kind of social benefit beyond the so-called "income dignity" that the government grants to people over 60 years old regardless of their social situation. However, this rent is very low.

Figure 7 Bolivia old-age dependency ratio



Source: Own elaboration based on data of Department of Economic and Social Affairs, Population Division – United Nations (2020).

So how do these people support themselves when they are old? The burden is generally transferred to family members. The ratio of dependency for people above 65 years old increased from 9.1 in 1980 to 14.2 in 2020 and is expected to be 49.7 by 2100 (United Nations, Department of Economic and Social Affairs, Population Division, 2019).

1.2 STUDY RELEVANCE AND IMPORTANCE

At an international level, there are known three models of economic management for retirement, these are: (i) Distribution system, (ii) Individual and (iii) Mixed Capitalization system.

The Distribution system is also known as “solidarity inter-generational” because pensions are financed on a Pay-As-You-Go (PAYG) basis by those currently employed and pension payments are of the defined benefit (DB) type. However, these systems were threatened by the change in the structure of the population pyramid. The individual capitalization system is based on the accumulation of financial wealth in defined contribution (DC) funded pension plans, uses actuarial mathematics (similar or equal to the ones that are used in the private insurance sector) to guarantee solvency and actuarial fairness. During their active life, worker constitutes a saving fund with contributions made during its working life, these are invested and once the worker reaches the retirement age, the worker receives a pension to live from the rest of their life. Finally, the mixed capitalization system is a mix of the two first schemes. Each country has its policies regarding retirement and pension schemes.

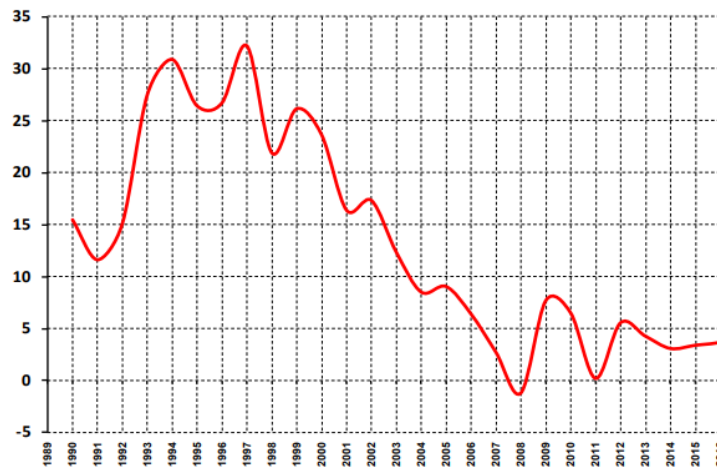
The pension system in Bolivia has evolved over the years trying to adapt to the socio-economic factors of the country. In 1996, the pensions system changed from the Distribution system to the individual capitalization system. However, in 2010, the *065-pension law* was promulgated and aimed to guarantee the universality and equity of the population to pension systems by adding a “solidarity Fund” whose main objective is to raise funds from the own pension system to increase the amount to those pensions that did not reach the minimum level. Most of the reforms of this law could have been based on political reasons regarding economic reasons. (Estado Plurinacional de Bolivia, 2010)

The retirement age is an important variable of the pension fund. And although many other countries are expecting to increase the retirement age (most of them high developed countries) due to the fact of the increase in Life expectancy and decrease of mortality rate and most of the developed countries are expecting to increase their retirement ages to more than 65 years. In contrast, in Bolivia, another reform made by the *law 065/2010* decreased the retirement age to 58 years for men and women; however, women that have enough contributions and amount can reduce 1 year for each child that they have up to 3 children, making the retirement age 55 for women). In this sense, Bolivia has the lowest retirement age for men and one of the lowest retirement ages for women in Latin America and Caribbean countries. (Estado Plurinacional de Bolivia, 2010)

Another important variable for the pension system is interest rates and financial market returns because all the contributions are invested. The expectation regarding interest rates could have caused first the reforms of 1996 in Bolivia (because the real interest rate was at the highest

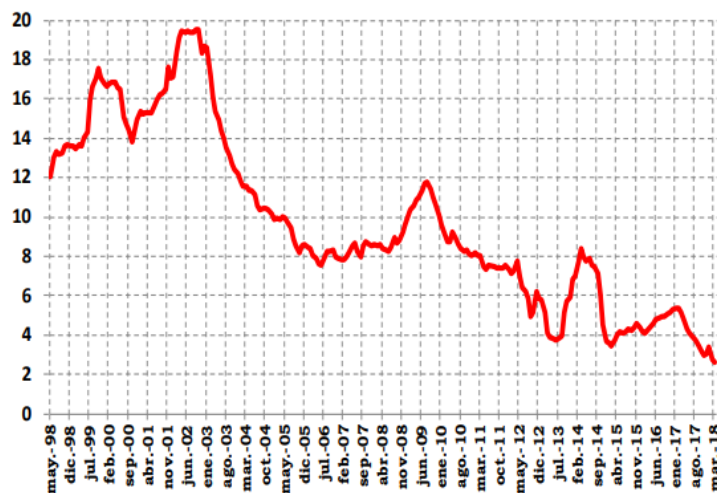
historical levels, reaching even 30%) these interest rates would allow to finance the pension funds of the country with a good or at least acceptable replacement ratio. Nevertheless, real interest rates reached the lowest point in 2008 due to the financial crisis and had never returned to those high levels, challenging pension funds' solvency. In Figures 7 and 8, it is possible to observe the drops in interest rates in Bolivia and the Nominal Return Rate of Pension Funds.

Figure 8 Real interest rate in Bolivia (1989 - 2016)



Source: La Salle University, La Paz – Bolivia

Figure 9 Nominal Return Rate of Pension Funds in Bolivia (%)



Source: La Salle University, La Paz – Bolivia

It is possible to observe that, even for the second reform to the Pension System Schemes in Bolivia the situation was not so flattering for the pensions systems. This situation is concerning for the authorities and the administrators of the Pensions Funds because with lower returns the pension funds can not guarantee a good level of replacement ratio, which today is just 39%, well

below the 60% target defined by the authorities. According to Rojas (2018), interest rates were expected to increase during the next years; however, the COVID 19 pandemic makes it hard to determine what could happen with the interest rates in Bolivia for the next years.

1.3 STUDY OBJECTIVES

1.3.1 General objective

The main objective of this thesis is to determine the relationship between Financial Literacy and Retirement Preparation of the working-age population in the city of La Paz - Bolivia.

1.3.2 Specific objectives

The thesis specific objectives are:

- Know the functioning of the Bolivian pension system.
- Describe Financial literacy / Describe Retirement Preparation.
- Know the socio-economic characteristics of working age in the city of La Paz.
- Develop an applicable probit regression model that can explore the impact of Financial Literacy on Retirement Preparation of the habitants of the urban area in La Paz – Bolivia.
- Determine the necessary modifications and the inclusion of relevant variables and control for the adequacy of the probit regression model in case there is a need to improve its robustness.

2. LITERATURE REVIEW

The technological development of past years has allowed exponential growth in the variety of financial services. Two decades ago, it was almost unimaginable that we could carry out financial transactions outside the bank and today we can already make payments from our mobile phones. This has made financial markets more accessible to small investors, especially in countries where financial markets are developed. However, with this, there are also strong doubts about the level of financial literacy of individuals. that now have greater responsibilities in the hands of saving, investing, and distributing their wealth over time (Lusardi & Mitchel, 2016).

The rapid growth of financial products and services of the last years can be very advantageous if it is used wisely, but for this users need to have a good level of financial knowledge; however, these new products can be difficult to understand for average investors who do not have a strong command of finance, leaving the authorities with great responsibilities to ensure that average individuals have the ability to make adequate decisions that allow making good decisions, not only for their future but for the good of national economies (Lusardi & Mitchel, 2016).

In terms of pension and retirement plans, in the past, as the government had control of pension plans, retirees mostly depended on pension funds and social security. Compared to today's world, where we have contribution plans defined individually according to the characteristics of each person, and also other challenges such as increased life expectancy and low mortality rates have forced workers to take more responsibility for their personal finances (Lusardi & Mitchel, 2016; Bravo, 2019).

Various international studies have shown that there is a close relationship between financial literacy and retirement planning in individuals and that individuals fail to save enough for their retirements. Empirical data also shows that there is low participation of individuals in financial markets, and a majority show a passive attitude about financial planning. Previous studies have shown low financial knowledge in individuals, potentially caused by low financial education and high complexity, which does not attract individuals to make financial education a priority in their lives. Financial Literacy has been shown to impact individuals' Retirement Planning, capital accumulation, and attitudes toward risky assets (Geng Niua, 2020).

2.1 FINANCIAL LITERACY

Financial Literacy is commonly described as “the efficiency of actual decision making” and the “skills in comprehending, managing and communicating financial matters” (Geng Niua, 2020), other authors in recent studies have a more developed and sophisticated definition of Financial Literacy as “the ability of people to process economic information and make informed decisions about their financial planning, accumulation of wealth, debt and pensions” (Lusardi & Mitchel, 2016)

There is an interesting distinction of Financial Literacy into three dimensions:

1. The objective knowledge dimension, referring to the “stock of the knowledge” that is related to personal financial knowledge of concepts and products. Where is also emphasized the application dimension that consists of applying and using financial knowledge in both the subjective dimension and the familiarity dimension.
2. Subjective knowledge dimension, both objective and subjective should be measured to explain financial literacy.
3. Familiarity dimension, which refers to the number of product-related experiences that an individual can have during his life (Hauff, Carlander, & Nicolini, Gianni, 2020).

Within this framework, different subjects can be defined:

1. Financially savvy individuals, those who achieve above-average returns on their investments (who may have objective knowledge and experience-based knowledge.)
2. Financially ignorant individuals, which can generate over-indebtedness, losses, and poor financial planning in general.

The conventional lifecycle approach to saving and sonic decisions suggests that a rational and well-informed individual will not consume all of his income in times of great wealth and will save for the future when income falls. These models suppose that individuals are able to develop saving plans and investments, which may require the completion of complex financial and economic calculations, in addition to having the necessary experience to be able to approach the different financial markets. (Lusardi & Mitchel, 2016). Previous studies have investigated how financial literacy in various settings and related it to various variables.

Delavande, Rohwedder, & Willis (2008) presented a simple model of two saving periods and the portfolio distribution between safe bonds and risky stocks, including the acquisition of human

capital in the form of financial knowledge. This paper suggests that individuals will optimally choose to invest in financial knowledge to gain access to higher-performing assets: this training helps them identify the best-performing assets or hire financial advisers who can reduce investment expenses.

Hsu (2011) uses a similar approach in an intra-family environment where husbands specialize in acquiring knowledge financial, while in general women increase their acquisition of financial knowledge whenever relevant (such as before the death of their spouses).

Jappelli and Padula (2013) also consider a model of two periods but additionally, they sketch a life cycle model of several periods where financial literacy is determined endogenously. They predict that financial literacy and wealth will correlate strongly throughout the life cycle, with a rise until retirement and a fall thereafter. They also suggest that, in countries with generous social security benefits, there will be little incentive to save and accumulate wealth and, at the same time, fewer reasons to invest in financial literacy.

2.1.2 Financial Literacy Measurement

Historically, the first way to measure financial literacy has been a survey of 5 questions used in a study of Health and Retirement in 2004, which served as a starting point. Those questions measure knowledge about inflation, mortgages rates, mortgages, bond pricing and diversification of investment portfolios. However, as the technology and variety of financial products increased over the years, it is important to make more developed surveys in order to measure correctly the financial literacy of the individuals. That is why studies included also numeracy questions (particularly for economic studies) and questions related to bank accounts and insurance products. (Geng Niu, 2020)

2.2 RETIREMENT FINANCIAL BEHAVIOR

Traditionally, the reasons for saving were related to the life cycle model, where the rationale of the individuals was to save and borrow to smooth consumption over life. More recent observations are not in line with this traditional model, there is a discrepancy observed in insufficient savings rates in individuals that are attempted to be addressed by behaviorally related explanations (Domínguez Martínez, 2018).

Retirement savings behaviour relies upon two assumptions:

1. Individuals know how to optimize over the life cycle, this is critical because people lack the cognitive ability to perform the optimization task, and usually use to copy strategies used by other individuals in order to compensate for cognitive short comes.
2. People have sufficient self-control to do this. This is more related to individuals that fail to decrease current consumption in order to have sufficient retirement income.

If these two assumptions do not meet, there will be substantial negative consequences.

2.2.1 Retirement saving

Retirement saving is an important part of the behavior on retirement planning, studies have demonstrated that objective financial knowledge has a huge impact on financial retirement behaviour. Is divided into three phases:

1. First phase – this phase is heavily affected by the level of financial literacy. Most of the people never undertake any retirement planning, those who scored high in financial literacy are more likely to have activities related to Retirement Preparation or at least had a thought about the topic. However, causality is ambiguous, because the intend to plan for retirement motivates individuals to increase their financial literacy (Hauff, Carlander, & Nicolini, Gianni, 2020).
2. Second phase - this phase shows evidence of being associated with financial literacy because it has been found to increase the probability of participating in pre-set retirement plans. The knowledge an individual has about a pension plan has similarly been shown to increase the likelihood of investments in the plan. On the other hand, individuals that score low in financial literacy, are more likely to rely on recommendations from retirement advisors high in financial literacy (Hauff, Carlander, & Nicolini, Gianni, 2020).
3. Third phase – Retirement investment. This phase relies on the investment activity of the individuals. Individuals high in financial literacy invest more in risky assets. Also, numeracy seems to have a significant impact on risk-taking (Hauff, Carlander, & Nicolini, Gianni, 2020).

2.3 FINANCIAL INCLUSION IN LATIN AMERICA

It is difficult to talk about financial literacy without including the financial inclusion connection, especially considering that in developing countries inequalities are greater and not all individuals have access to financial instruments or the education to manipulate them.

In Latin America and the Caribbean, the recurring financial crises have greatly diminished the confidence of individuals in the formal sector, which leads the population to resort to informal markets, but distrust is not the only factor, it is also relevant to know There are other factors such as social pressure, high transaction costs, but above all the lack of knowledge of financial products and markets that also affect individuals to resort to the formal sector for their transactions in daily life and for planning their future (Mejia, Roa Garcia, 2018).

The evidence shows that in Latin America a large percentage of the population uses informal financial instruments (savings, credit, and payments) and that the levels of financial inclusion are very low. And it is that you cannot talk about financial education without touching on the issue of inclusion, since they are two concepts that go hand in hand to understand the financial behavior of individuals, especially in developing economies (Mejia, Roa Garcia, 2018).

One of the main lessons of the 2007-2008 financial crisis is the importance of understanding the functioning of the financial system on both the supply and demand sides. Central banks have endeavored to develop different strategies to financially educate people to improve their financial education and thus guarantee their participation in the formal market, based on an adequate financial education that allows the individual to develop skills in selecting the financial products that are required. are more suited to their needs to improve their well-being and the well-being of the economy, since it has been shown that monetary policies tend to be more successful when the level of financial education of the population tends to be higher (Mejia, Roa Garcia, 2018).

In Latin America, surveys in various studies showed a lack of financial education as a result, especially in people with less education and income, young people, the elderly and inhabitants of rural areas. The indicators also show financial access with considerable growth, a greater number of branches of financial institutions, an increase in bank accounts and formal financial institutions, and greater availability of electronic tellers. However, despite the growth of formal participation, the use of more complex financial processes is still limited by the low financial knowledge of individuals (Mejia, Roa Garcia, 2018).

Globalization and technological advances in recent years have considerably expanded the offer of financial products and services, which is why it is important to improve people's financial education to improve their decision-making skills (Mejia, Roa Garcia, 2018).

The CAF study – “Financial decisions of households and inclusion financial: evidence for Latin America and the Caribbean” showed the different points as a result (Mejia, Roa Garcia, 2018):

1. Differentiated strategies must be generated for different segments of the population that show less financial capacity.
2. A relevant relationship was found between financial education and individual savings capacity, which shows that the greater the financial education, the greater the saving capacity.
3. Gender differences do not affect all women in the same way. An important finding was that women who are head of the family show better financial attitudes.
4. The recipients of transfers and subsidies by the government have worse results in the index of concepts and knowledge and also show behaviors contrary to saving.

The Bank of England report in 2015 has shown that there is a strong need to generate data to be able to analyze and understand the financial and economic behavior of individuals to help understand practices such as not now enough for retirement, investing in excess. in extremely risky assets, manage and acquire expensive mortgages and accumulate on debt. (Mejia, Roa Garcia, 2018)

In the case of Bolivia, there has been sustained growth over the years in terms of financial participation in the formal market, however, in terms of financial literacy it has been found that this greatly affects the socio-economic stratum of the population. The higher the socioeconomic stratum, the individuals have the greater financial knowledge and greater participation in the formal market in the same way, the population in rural areas shows lower indicators of both participation in the formal financial market and financial literacy (Mejia, Roa Garcia, 2018).

3. METHODOLOGY

The main purpose of this research is to determine the influence of Financial Literacy and other socio-demographic factors on Retirement Preparation.

Hypothesis – Retirement Preparation, Individuals who are financially literate tend to plan their retirements or at least have thought about it.

H0: Financial Literacy has a positive impact on an individual's Retirement Preparation in La Paz, Bolivia.

H1: Financial Literacy does not have a positive impact on an individual's Retirement Preparation in La Paz, Bolivia.

3.1 GEOGRAPHICAL SCOPE AND POPULATION PROFILE

The geographic scope of this study will be limited to the seven macro districts of La Paz City. Some interesting facts are that Cotahuma is the district that has the highest poverty index. The Center district concentrates the less percentage of young population and also has the highest % of people with more than 13 years of education. The youngest district is Max Paredes, the highest illiteracy rate has been found in the district of Mallasa. Table 2 contains some shows the complete indicators found in the macro-district cards of the La Paz Government in 2018. (Gobierno Autónomo Municipal de La Paz, 2018)

Table 2 Population characteristics of the 7 macro-districts of La Paz City, Bolivia

Population characteristics of the 7 macro-districts of La Paz City, Bolivia										
(in %)										
Macro-district	Population	Male	Female	Population < 25years old	Population in working age	Illiteracy rate	Population w/o any education	Population w/education + 13years	Poverty index	Extreme poverty index
Cotahuma	19.51	48.50	51.50	42.70	84.00	0.90	1.30	56.80	42.80	21.30
San Antonio	14.70	48.00	52.00	46.80	83.20	1.30	1.60	51.60	39.00	18.80
Periferica	20.02	48.20	51.80	46.90	83.60	1.40	2.10	49.90	41.40	18.20
Max Paredes	20.77	47.70	52.30	48.90	87.80	1.50	1.40	47.30	40.00	17.70
Mallasa	0.83	48.00	52.00	44.80	83.20	1.70	1.90	55.30	30.20	15.40
Center	8.10	48.00	52.00	35.10	87.80	0.20	0.40	77.40	37.60	12.70
South	16.07	47.50	52.50	48.10	84.90	1.10	1.00	66.10	37.60	10.90

Source: Author's elaboration based on information found in the Macro-district cards of the La Paz Government in 2018.

Due to the characteristics of the population, the population target for this study will be individuals of working age (over 18 years of age) living in the city of La Paz that work formally or informally, or that are dependent on their partners (housewives, and others).

3.2 DATA COLLECTION

Initially, a first test survey was developed with 17 designed to measure financial literacy and 12 questions of sociodemographic characteristics. In this test, 20 people of different age ranges and education were interviewed to find out their opinions about the surveys, the average response time was 09:34 minutes. The survey was rated as very long, tiring and even frustrating by some of the respondents, those whose level of financial education was low and did not know most of the answers, they also stated that they thought several times to stop responding to the survey. Therefore, the survey was reduced and modified so that it is more accessible to the respondents and we can obtain more reliable data. Ending with a survey with 9 questions on financial literacy.

It was also seen the need to include the question of people's occupation so that those who work in financial institutions can be differentiated from the rest because clearly, they will have a certain advantage over the average respondents who have other occupations.

Data was collected through a 9 questions survey that sought seek to obtain data on people's basic financial literacy, with day-to-day questions on finance, such as banking services, concepts such as inflation, interest rates, the value of money over time, monetary policies, investment risks, measure the level of advanced financial literacy in people, with questions about portfolio and investment management, financial instruments such as bonds, stocks. This survey also includes socio-economic and demographic questions, variables that will be added to the model; in addition, this survey will contain questions of retirement planning in people, if they participate in the Pension Funds, if they have access to private life insurance, if they are self-employed, its education level, among other social security, the questionnaire is included in **Appendix 1**.

3.2.1 Sample size

According to the National Institute of Statistics, the population living in the urban area of the city of La Paz over 18 years is 1,376,581 habitants in 2020. Therefore, the sample size will be calculated based on the formula of infinite populations for 95% confidence. (Cinca, 1997)

$$S = \frac{z^2 * P * Q}{e^2} \quad (1)$$

Where $Z = 1.96$, $P = Q = 0.5$, $e = 0.05$ (5%), and n is the sample size. From (1), we obtain a 384-sample size.

3.3 APPLICABLE MODEL

Given that the variable of interest in this study is binary, and it seeks to study the probability of "success" or "failure" of the inhabitants of the city of La Paz in planning their retirement, the model to be used will be a Probit regression. Following the statistical standards, we consider the dependent variable Y to take the value 1 if the inhabitant has a retirement planning and 0 otherwise, with probabilities P and $(1-p)$ respectively.

$$y_i = \begin{cases} 1, & \text{with probability } p_i \\ 0, & \text{with probability } (1 - p_i) \end{cases}$$

The probit model is a common practice to study a binary response model, as it treats the analysis in a similar way as the logistic regression. It implies a probit link functions and it is generally estimated using the maximum likelihood method. The model takes the form below:

$$P_r(Y = 1|X) = \Phi(X^T \beta) \quad (2)$$

Where: P_r corresponds to the probability of occurrence, Φ represents the Cumulative Distribution Function of the normal distributions and β are the coefficients estimated by the maximum likelihood. Basically, this says that, conditional on the regressors, the probability that the outcome variable, Y_i is equal to 1, is a given function of a linear combination of the regressors. (Aldrich & Nelson, 1984)

Marginal effects

In a probit model, the coefficients do not have a direct interpretation. We are usually interested in the *ceteris paribus* effects of changes in the regressors that affect the characteristics of the outcome variable. This is the notion that marginal effects measure.

The marginal effect is the derivative of that function:

$$\partial P_r(Y_i = 1 | X_i, Z_i, t_i) \partial x = \Phi(\alpha + \beta X_i + \gamma Z_i + \psi t_i) * \beta \quad (3)$$

where $\phi ()$ is the standard normal pdf.

There are several ways to calculate the marginal effects.

- **The Marginal Effect of a Representative (MER):** this method picks a particular set of right-hand-side variables the researcher is particularly interested in and calculate the marginal effect for them.
- **The Average Marginal Effect (AME):** is the mean of each individual observation's marginal effect.
- **The Marginal Effect at the Mean (MEM):** it represents a hypothetical observation with the mean values of each variable, it is an observation that do not exist in the reality.

3.4 VARIABLES DEFINITION

Table 3 Variables definition

Variables definition	
ret_prep	A dummy variable that equals one if the respondent answer to yes to any of the three questions about Retirement Preparation and zero otherwise.
fli	Corresponds to the Financial Literacy index, on a scale from 0 to 1.
risk_av	The respondent's risk aversion. 1= not willing to take any risk; 2= Low risk; 3=Average risk; 4=High risk.
self_finlit	The respondent's self-assessed Financial Literacy. 1= Much lower; 2= Lower; 3=Average; 4=Higher; 5=Much Higher.
age	The respondent's age. 1= 18-30 interval; 2= 30-40 Interval; 3=40-50 Interval; 4=50-60 Interval; 5=60 and more.
male	A dummy variable that equals one if the respondent is male and zero if female.
<u>Education</u>	
highschool	A dummy variable that equals 1 if the respondent's maximum education level is Highschool and zero otherwise.
bachelor	A dummy variable that equals 1 if the respondent's maximum education level is Bachelor and zero otherwise.
postgrad	A dummy variable that equals 1 if the respondent's maximum education level is Postgraduation or above and zero otherwise.
<u>Civil status</u>	
single	A dummy variable that equals one if the respondent is single and zero otherwise.
married	A dummy variable that equals one if the respondent is married and zero otherwise.
widower	A dummy variable that equals one if the respondent is a widower and zero otherwise.
divorced	A dummy variable that equals one if the respondent is divorced and zero otherwise.
<u>Employment</u>	
employed	A dummy variable that equals one if the respondent is employed and zero otherwise.

self_emp	A dummy variable that equals one if the respondent is self-employed and zero otherwise.
unempl	A dummy variable that equals one if the respondent is unemployed and zero otherwise.
retired	A dummy variable that equals one if the respondent is retired and zero otherwise.
fin_sector	A dummy variable that equals one if the respondent has worked in the financial sector and zero otherwise.
location	The respondent's home location. 1=Periferica; 2=Santo Antonio; 3=Max Paredes; 4=Mallasa; 5=Cotahuma; 6=Center; 7=South..
children	A dummy variable that equals one if the respondent answers that have children and zero otherwise.
fam_memb	<u>The number of family members // 1=1; 2=2; 3=3; 4=4; 5=5+</u>
fam_inc	The total of the family income// 1= Less than Bob. 2,000; 2= Between Bob. 2,000 and Bob. 5,000; 3=Between Bob. 5,000 and Bob. 8,000; 4=Between Bob. 8,000 and Bob. 11,000; 5=More than Bob. 11,000
fin_inc	A dummy variable that equals one if the respondent answers participate of the financial system having at least a savings account and zero otherwise.
minority	A dummy variable that equals one if the respondent does not belong to Han ethnic group, and zero otherwise.

Source: Author's preparation.

4. FINANCIAL LITERACY

The survey performed in this research contains 9 questions to measure Financial Literacy. These questions intended to explore the knowledge of individuals for day-to-day financial transactions, an understating of interest rate level, numerical skills, inflation, interest compounding and the time value of money the awareness of the central bank; knowledge of complex financial instruments, understanding of financial concepts, such as the tradeoff between risk and return and risk diversification; and the workings of the stock market.

These nine questions were used to create a Financial Literacy index, based on the methodology applied by Geng Niua, Y. Z. in 2020 in the study Financial Literacy and Retirement Preparation in China, due to the small amount of questions applied in this study a single index was created to measure the Financial Literacy. Where each individual got a score from 0 to 1 based on the number of correct questions answered.

Table 3 summarizes the responses to the survey of Financial Literacy questions. Panel A shows the proportion (in percentage) of individuals that answered correctly incorrectly or do not know the answer. While panel B reports the distribution of the number of correct, incorrect and do not know answers for the 9 questions designed to measure Financial Literacy.

More than 60% of the respondents answered correctly the question about inflation, interest rate level, and numeracy. The percentage drops drastically to almost 40% when we consider interest compounding knowledge. A striking observation is that only 5.6% of respondents were able to answer correctly all nine questions, another striking observation is that 79.02% of respondents are correct about the trade-off between risk and return, which makes this question the easiest to answer out of all 9 Financial Literacy questions

Table 4 Summary of responses –Financial Literacy

Panel A – Responses to Financial Literacy question by percentage:

	Interest rate	Numeracy	Interest Compounding	Inflation	Time value	Risk Knowledge	Bank	Riskiest Asset	Stock Market
Correct	66.20	62.00	39.86	68.76	56.41	79.02	87.41	41.96	53.38
Incorrect	17.48	31.00	52.68	13.52	33.10	6.06	12.59	36.83	21.68
Do not know	16.32	6.99	7.46	17.72	10.49	14.92	-	21.21	24.94

Panel B – Number of correct, incorrect and do not know answers out of five questions:

	none	1	2	3	4	5	6	7	8	All	Mean
Correct	0.6993	4.4289	5.5944	7.2261	11.422	15.618	16.317	19.114	13.986	5.5944	5.55
Incorrect	11.189	21.212	29.604	20.047	10.023	4.4289	2.5641	0.6993	0.2331	0	2.25
Do not know	55.944	13.52	13.054	6.993	3.2634	1.6317	2.331	1.8648	1.3986	0	1.20

Source: Author's preparation.

From a policy point of view, it is important to examine Financial Literacy across subgroups, as expected, Financial Literacy varies across demographics, we can see that almost 40% of the respondents with primary education end up in the lowest quartile of Financial Literacy, while almost 60% of the respondents that have a postgraduation fall into the highest quartile. In terms of gender, we see a slight superiority of males over females. Also, as expected, we see a moderate negative correlation between age and Financial Literacy, as we can see almost half of the respondents between 18 and 30 years old falling into the highest Financial Literacy quartile. While for other ages the percentage falls more than 10%

Table 5 Financial Literacy across demographics

Financial Literacy across demographics						
	1 (Low)	2	3	4 (High)	N	%
Education						
Primary	38.89	22.22	27.78	11.11	18	4.20
Highschool	15	33.75	43.75	7.50	80	18.65
Bachelor	7.66	16.86	30.27	45.21	261	60.84
Postgraduation	8.70	7.25	26.09	57.97	69	16.08
Gender						
Male	8.56	17.57	27.48	46.40	222	51.75
Female	13.04	19.81	36.71	30.43	207	48.25
Age						
18-30	9.64	15.74	28.93	45.69	197	45.92
31-40	13.04	17.39	39.13	30.43	69	16.08

41-50	20	26	32	32	50	11.66
51-60	11.84	21.05	32.89	34.21	76	17.72
61+	10.81	21.62	32.43	35.14	37	8.62
Occupation						
Employed	5.62	12.92	35.96	45.51	178	41.49
Self-employed	16.13	24.19	35.48	24.19	124	28.90
Unemployed	14.89	27.66	29.79	27.66	47	10.96
Retired	-	21.43	14.29	64.29	14	3.26
Student	13.64	16.67	19.70	50	66	15.38
Civil Status						
Single	11.76	18.10	27.60	42.53	221	51.52
Married	6.90	18.62	37.93	36.55	145	33.80
Widower	-	41.67	33.33	25	12	2.80
Divorced	18.52	11.11	25.93	44.44	27	6.29
Location						
Periferica	23.08	35.9	28.21	12.82	39	9.09
Santo Antonio	10.53	13.16	50	26.32	38	8.86
Max Paredes	10.71	21.43	35.71	32.14	28	6.53
Mallasa	19.05	14.29	19.05	47.62	21	4.9
Cotahuma	2.78	5.56	66.67	25	36	8.39
Center	5.95	26.19	26.19	41.67	84	19.58
South	10.93	15.3	25.68	48.09	183	42.66
Family income						
Less than Bob. 2,000	20	30	35	15	20	4.66
Between Bob. 2,000 and Bob. 5,000	21.7	28.3	26.42	23.58	106	24.71
Between Bob. 5,000 and Bob. 8,000	7.37	16.84	35.79	40	95	22.14
Between Bob. 8,000 and Bob. 11,000	10.96	17.81	31.51	39.73	73	17.02
More than 11,000	2.96	11.11	3333	52.59	135	31.47

Source: Author's preparation.

It is important to mention as well, that more than 42% of the respondents live in the South district, which has a high level of social and economic status, historically people that had more access to education, and relatively have more income. That is also reflected in the family income, where we see a positive correlation with Financial Literacy, the more the income is, the more financially literate are the individuals. Another striking observation is that single and divorced people fall in higher Financial Literacy quartiles than married or widowed individuals. That is expected as well, as the majority of the single people are also young, meaning that they are expected to fall into higher quartiles.

It is important to understand the Financial Literacy as well across the risk aversion. As the table shows below, more than 40% of individuals not willing to take any risk fall into the lowest

quartile, while more than 40% of those that want to bear any risk level, fall into the highest quartile.

Table 6 Financial Literacy across risk aversion

Financial Literacy across risk aversion						
	1 (Low)	2	3	4 (High)	N	%
Risk Aversion						
Not willing to take any risk	44.44	22.22	25.00	8.33	36	8.39
Low Risk	15.25	20.34	23.73	40.68	59	13.75
Average Risk	5.60	19.03	33.58	41.79	268	62.47
High Risk	9.09	12.12	37.88	40.91	66	15.38

Source: Author's preparation.

It is important to analyze the level of confidence as well of people regarding their Financial Literacy and the real Financial Literacy, we see that more than 46% of those individuals who think that they have a much lower Financial Literacy level than the average of the population of La Paz are falling into the lowest quartile, while more than 70% of the respondents that think they have a much higher level of Financial Literacy fall into the highest quartile.

Table 7 Financial Literacy across Self-Assessed Financial literacy

Financial Literacy across Self-Assessed Financial Literacy						
	1 (Low)	2	3	4 (High)	N	%
Self-assessed FL						
Much lower than the average	46.34	21.95	26.83	4.88	41	9.56
Lower than the average	18.31	39.44	32.39	9.86	71	16.55
Average	6.43	19.30	42.69	31.58	171	39.86
Higher than the average	1.72	5.17	23.28	69.83	116	27.04
Much higher than the average	3.33	13.33	10.00	73.33	30	6.99

Source: Author's preparation.

5. RETIREMENT PREPARATION ANALYSIS

At the first stage, a probit regression was implemented considering all the independent variables, including the Financial Literacy index, and where Y was the Retirement Preparation binary variable. The main objective is to analyze the significance of the variables and its marginal effects to the Retirement Preparation.

Taking in consideration the p-values of the first probit regression model (for all the purposes model 1), the variables that were found to be statistically significant were: fli, male, highschool, selfemp, fammemb, faminc and minority with an AIC of 511.28

All the variables that were statistically significant were extracted and included in a second model (model 2) to analyze them further, where is noticed that the variables that have the higher statistical significance are fli, faminc and selfemp and an improvement on the AIC indicator that equals 502 for this model.

Going further, Model 3 was obtained by applying the stepwise function and in order to optimize the AIC indicator to find the model that can explain the best, giving the result and AIC of 493.47 and a model where the independent variables are fli, age, male, highschool, bachelor, postgrad, selfemp fammemb, faminc and minority. In this model all the variables are statistically significant. However, we can also notice a decrease of the statistical significance of Financial Literacy. Table 9 in appendix 2, shows the statistical significance of all the variables corresponding to the 3 models.

As a probit model is used for this study, the coefficients can give as a wrong understanding about the effect of each variable for Financial Literacy. That's why the marginal effects were calculated in order to analyze the effect of each variable on the Retirement Preparation of the habitants of the urban area of La Paz. Table 8 shows the marginal effects calculated for the 3 models.

As expected, Financial Literacy of individuals has a positive impact on their Retirement Preparation.

Table 8 Effects of Financial Literacy on Retirement Preparation

	Model 1	Model 2	Model 3
fli	0.03575**	0.04305***	0.03678**
riskav	-0.0483		
selffinlit	-0.01895		
age	-0.04176		-0.05994*
male0	-0.1186**	-0.1038*	-0.1044*
highschool0	0.3802*	0.1202	0.4052**
bachelor0	0.2575*		0.2788*
postgrad0	0.2767		
single0	-0.02906		
married0	0.03134		
widower0	0.1911		
divorced0	0.0005215		
employed0	0.08976		
selfemp0	0.2279**	0.1742***	0.1612**
unempl0	0.08489		
finsector0	-0.0363		
location2	-0.05366		
location3	-0.108		
location4	-0.2602*		
location5	-0.1215		
location6	-0.1437		
location7	-0.06885		
children0	-0.002803		
fammemb	0.03429*	0.0369*	0.03672*
faminc	-0.0476*	-0.04958**	-0.04637*
fininc0	-0.03082		
minority0	0.1381*	0.1148*	0.1303*

***, ** and * indicate 1%, 5% and 10% significance levels, respectively

Source: Author's elaboration based on R output.

As expected, Financial Literacy has a positive effect on the Retirement Preparation of the individual of the urban area of La Paz; However, it seems to decrease when more control variables are added to the model.

Contrary to what other studies found in the past (such as financial literacy and Retirement Preparation in China, 2020), the male variable has a negative effect on retirement planning. This indicates that women plan their retirement less than men. Although historically men have had

better financial education and savings capacity, in the case of Latin America, according to Diana Mejia, an expert in financial inclusion and co-author of the report Socioeconomic Determinants of Financial Education. Evidence for Bolivia, Colombia, Ecuador and Peru made by the CAF in 2016: “Women in Latin America continue to have lower levels of financial education than men, but when they control household finances, they tend to have less aversion to risk. their finances personally and are more likely to plan based on long-term financial goals,” which contradicts our finding. (Mejía, D., & Rodríguez, G, 2016)

Individuals that hold a high school diploma or bachelor’s degree have a negative effect on Retirement Preparation, this can be considered because, most of the population that hold a diploma tend to work in the formal sector and participate in the mandatory government pension system. Also, as an individual has better education, it is more likely to obtain a better position in its company, what can make the individual think the pension will be better when reaching elderly stage and trust more in pension systems. This seems to be in line with the findings on the studies Retirement Preparation in the Netherlands or Retirement Preparation in China, cited further above this article, where the level of education had a negative effect on retirement planning, since individuals with a higher level of education could obtain better job positions. work and as a consequence they trusted more in their pension funds.

The variable fammeb shows a positive relationship between the number of people that make up a family unit and preparation for retirement. This finding is interesting, we could think that the heads of families that have more members could be more relaxed when planning their retirement, since having several members in the family, they could be supported by some of them when they reach old age. however, these heads of households seem to have better financial planning.

The variable faminc shows us a negative relationship with Retirement Preparation. This can be expected, since people with higher incomes have less incentive to plan for retirement. On the other hand, those who are self-employed tend to have better long-term financial planning. Both findings follow the same pattern as the Financial Retirement and Retirement Preparation in China and Financial Retirement and Retirement Preparation in the Netherlands studies.

The variable minority shows a negative correlation when an individual identifies itself as part of a minority.

6. CONCLUSIONS

Based on the bibliographic review and the development of the model, it is possible to conclude that the level of Financial Literacy has a positive impact on the Retirement Preparation of individuals in the city of La Paz. Since it has a statistically significant correlation, therefore the null hypothesis of this investigation is accepted.

One of the main findings of this research is also found in one of the control variables. The analysis of the model showed that women tend to plan their retirement worse than men. This not only implies that the authorities should take public policies to enhance the education of women and therefore improve the indicator, but it is also recommended to carry out studies in the future that can explore the reasons why women are at a disadvantage in the Retirement Preparation, in order to later be able to generate public policies that help women to make better financial decisions.

There is a strong correlation between independent workers and Retirement Preparation, in a country like Bolivia and in a city like La Paz, where many informal traders and small businesses are concentrated, many of them are not included in the formal financial sector. Being the inhabitants of Bolivia the ones who save the most in Latin America, around 38% of the savers do it outside the financial/formal sector. The reasons why the population of both La Paz and Bolivia do not trust the formal financial sector and pension funds must be studied in depth, since it is not possible to have a real control of the financial planning of the people and in other countries. Consequently, political and economic decisions can be made by the authorities that can be potentially incorrect for the population profile and needs.

The city of La Paz is a metropolis that welcomes many immigrants from the interior of the country and from the rural area, as shown in the model, people who are part of an ethnic minority have a lower probability of planning their retirement; therefore, are most vulnerable when reaching elderly stage. The public policies of the government and also of the private sector must guarantee the participation of minorities in the formal sector, for this not only financial education campaigns should be carried out, but also generally improve the conditions of minorities, so that they can obtain better living conditions both in the present and in the future.

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APPENDIX

➤ Appendix 1

Survey

Financial Literacy Questions

Q1. Interest Rate Level. What is the Current 1-Year Deposit Rate?

- (1) Below 1%. (2) Between 1% And 5%. (3) Between 5% And 10%. (4) Above 10%. (5) I Don't Know.

Q2. Arithmetic. Suppose you Have Bs. 10,000 in a savings account and the interest rate is 3% per annum and you never withdraw money or interest payments. After 1 year, how much would you have in total in this account?

- (1) Exactly Bs. 10,300.00 (2) More than Bs. 10,300.00 (3) Less than Bs. 10,300.00 (4) I Don't Know.

Q3. Compound Interest. Suppose you have Bs. 10,000 in a savings account and the interest rate is 3% per year. After 2 years, How much do you think you would have in the account if you let the money grow?

- (1) Exactly Bs. 10,600.00 (2) More Than Bs. 10,600.00 (3) Less Than Bs. 10,600.00 (4) I Don't Know.

Q4. Inflation. Suppose the interest rate on your savings account was 3% per year and inflation was 5% per year. After 1 Year, how much could You buy with the money in this account?

- (1) Exactly the same. (2) More than today. (3) Less than today. (4) I don't know.

Q5. Money Value over Time. Suppose that Maria receives an inheritance of Bs. 100,000 today, While Juan will Receive an inheritance of Bs. 100,000 in 3 years.

Which inheritance is worth more?

- (1) Inheritance of Maria. (2) Inheritance of John. (3) Both are worth the same (4) I don't know.

Q6. In General, Investment Opportunities with High Returns Have High Risks. True or False?

- (1) True. (2) False. (3) I Don't Know.

Q7. What Bank Formulates and Implements Monetary Policy in Bolivia?

- (1) National Bank of Bolivia. (2) Central Bank of Bolivia. (3) Banco De Crédito De Bolivia. (4) Productive Development Bank. (5) I Don't Know.

Q8 Normally, Which Asset Is Riskier?

- (1) Savings Account. (2) Bonds. (3) Actions. (4) Mutual Funds. (5) I Don't Know.

Q9 Which Statement Describes the Main Function of The Stock Market?

- (1) The Stock Market Helps Predict the Earnings of Stocks.
- (2) The Stock Market Results in An Increase in The Price of Shares.
- (3) The Stock Market Brings Together People Who Want to Buy Shares Together with Those Who Want to Sell Shares.
- (4) None of The Above.
- (5) I Don't Know.

Appendix B - Planning the Reform

P1. Retirement Planning. Have you ever tried to calculate how much you need to save for retirement?

- (1) Yes. (2) No.

P2. Do you contribute to the Pension Plan Authorities?

- (1) Yes (2) No.

P3. Did you establish an independent retirement / retirement plan (business, investments in real estate, private life insurance, among others) that allows you to have income in the elderly?

- (1) Yes. (2) No.

P3. Risk Aversion. suppose you are going to make an investment, what projects would you like to choose?

- (1) High Risk, High Return Projects. (2) Average Risk Projects, Average Return (3) Low-Risk, Low-Return Projects; (4) You Are Not Willing to Take Any Risk.

Q5 Self-Assessed Financial Knowledge. How would you rate your general financial knowledge relative to the average level of your peers?

- (1) Much higher than the average level of inhabitants of the city of La Paz.
- (2) Higher level than the average of inhabitants of the city of La Paz.
- (3) At the average level of inhabitants of the city of La Paz.
- (4) Lower than the average population of the city of La Paz.
- (5) Much lower than the average level of inhabitants of the city of La Paz.
- (6) I don't know.

Part 2 - Sociodemographic Characteristics

P1. Age

- (1) Between 18 and 30 years old
- (2) Between 30 and 40 years old
- (3) Between 40 and 50 years old
- (4) Between 50 and 60 years
- (5) More than sixty years.

P2. Gender

- (1) Woman.

(2) Male.

P3. Macro-districts. In which of the following macro-districts of the city of La Paz do you live?

- (1) Peripheral
- (2) Centro
- (3) Santo Antonio
- (4) Max Paredes
- (5) Mesh
- (6) Cotahuma
- (7) Sur

P4. What is the income level of the family aggregate?

- (1) Less than Bs. 2,000
- (2) Between Bs. 2,000 and Bs. 5,000
- (3) Between Bs. 5,000 and Bs. 8,000
- (4) Between Bs. 8,000 and Bs. 11,000
- (5) More than Bs. 11,000

P5. What is your level of education?

- (1) Primary
- (2) High School
- (3) Bachelor's degree
- (4) Postgraduate – Master Degree
- (5) PhD

P6. What is your marital status?

- (1) Single
- (2) Married
- (3) Widower
- (4) Divorced
- (5) In concubine

Q7. How many people make up your family aggregate?

- (1) 1
- (2) 2
- (3) 3
- (4) 4
- (5) 5+

Q8. Employment situation

- (1) Unemployed
- (2) Retired
- (3) Independent
- (4) Employee
- (5) Student

Q9. If you are employee and independent worker, in which activity sector is your main occupation?

- (1) Primary sector (agriculture, livestock and fishing)
- (2) Secondary sector (Industry, civil construction...)
- (3) Tertiary (Health, Commerce, education, banking sector, tourism...)

Q10. Are you or were you employee of the financial sector?

- (1) Yes (2) No

Q11. Do you use at least one of the following financial services in any financial institution?
(Savings account, debit card, credit card, mobile banking)

- (1) Yes (2) No

Q12. Do you consider yourself a member of an ethnic minority?

- (1) Yes (2) No

➤ Appendix 2

Table 9 Statistical significance of variables across the models

P-values and residuals for each model			
	Model 1	Model 2	Model 3
Intercept	1.07 (1.6)	0.66* (0.32)	0.57 (1.01)
fli	0.12** (0.04)	0.13*** (0.04)	0.12** (0.04)
riskav	-0.16 (0.1)		-0.16 (0.1)
selffinlit	-0.06 (0.09)		.
age	-0.14 (0.08)		0.19*** (0.05)
male0	-0.4** (0.15)	-0.32* (0.14)	-0.34* (0.14)
highschool0	1.22* (0.51)	0.36 (0.19)	1.28** (0.47)
bachelor0	1.01* (0.51)		1.09* (0.47)
postgrad0	0.89 (0.55)		0.98* (0.49)
single0	-0.1 (0.37)		
married0	0.1 (0.33)		
widower0	0.59 (0.49)		
divorced0	0 (0.42)		
employed0	0.3 (0.21)		
selfemp0	0.72** (0.24)	0.52*** (0.18)	0.5** (0.16)
unempl0	0.27 (0.29)		
finsector0	-0.12 (0.17)		
location2	-0.2 (0.38)		
location3	-0.38 (0.4)		
location4	-0.84*		

	(0.37)		
location5	-0.43		
	(0.44)		
location6	-0.5		
	(0.33)		
location7	-0.25		
	(0.33)		
children0	-0.01		
	(0.22)		
fammemb	0.11	0.11*	0.12*
	(0.06)	(0.06)	(0.06)
faminc	-0.14*	-0.15**	-0.15*
	(0.07)	(0.06)	(0.06)
fininc0	-0.1		
	(0.33)		
minority0	0.44*	0.34*	0.40*
	(0.19)	(0.17)	(0.18)
N	429	429	429
AIC	511.28	502	493.47
BIC	625	534.5	542.21
PseudoR2	0.22	0.13	0.18
*** p < 0.001; ** p < 0.01; * p < 0.05			

Source: Author's elaboration based on R output