The Determinants of Not Having a Retirement Savings Account: An Empirical Analysis for Mexico

José González-Núñez[1], Karl J. Zimmermann[2], Salomón Domínguez[1]

[1]Universidad Anáhuac México
[2]Umweltbundesamt / Agencia Federal de Medio Ambiente, Investigador en la Universidad Anáhuac México
Email: josecarlos.gonzalez@anahuac.mx

Abstract

This study explores the application of predictive accounting, focusing on the integration of artificial intelligence (AI) to optimize budget management in large corporations. The research investigates how machine learning algorithms can forecast financial outcomes, streamline decision-making processes, and improve financial planning accuracy. By analyzing real-time financial data and historical trends, AI enhances the precision of budgeting practices, reduces human error, and allows for proactive adjustments in financial strategies. This paper presents case studies of large organizations that have successfully implemented AI-driven budgeting tools, highlighting their impact on operational efficiency and financial performance.

Keywords: Predictive accounting, Artificial intelligence, Budget management, Financial forecasting, Machine learning, Large corporations, Financial planning, Optimization.

1. Introduction

Financial inclusion, which includes pension coverage, is a topic that has generated interest in the literature, which has documented effects both at the household and firm level and at the macroeconomic level (CNBV, 2022). Several studies at the aggregate level have found a positive relationship between greater financial inclusion and economic growth and development (Barajas, et al., 2020; Demirguc-Kunt, et al., 2017; Cull et al., 2014; Beck et al., 2009). Tackling the lack of financial inclusion to unleash these potentials is especially relevant in emerging market economies with sizable middle classes having the potential to save. Yet, for example, pension coverage remains low in Latin America, and specifically in Mexico. The Mexican pension reform of 1997 aimed to increase the sustainability of pension financing by introducing a defined contribution system using personal accounts (PA's) for retirement savings.[1] This instrument technically represents the opportunity for individuals working informally or being self-employed to save for old age and, under certain conditions, to receive a recurrent pension annuity. Yet, the national survey on financial inclusion (IMEF 2021) shows that a large share of respondents, 59%, have no account.

[1] The contributions accumulate throughout working life, and entitle the worker to a pension at the time of retirement (CNBV, 2022).

The extant literature has so far mainly analyzed the motives to save or to make contributions to the pension system. Yet, to the best of our knowledge, the reasons for individuals not being part of the pension system, while technically they have the opportunity, have not been analyzed. To this end, we employ a multi-nominal logistical model where the dependent variable is constituted by the multi-categorical answer to the survey question for the reasons for not having a PA in the IMEF 2021 survey.

The main contribution of this research is to categorize non-PA holders and describe commonalities in each category as well as differences between categories. We do so by identifying significant variables that explain these categories which differentiates among non-PA holders as opposed to the common approach to divide the population in holders and non-holders. This enables us to propose more specific policy recommendations aiming at increasing enrollment at AFOREs.

We find that there is a large group of respondents (45%), which we take as the reference group, stating that not working is the main reason for not having a PA. Next to this reference group, there are two groups stating "low income" (group 2, 17.5%) or "no knowledge about PA's and saving" (Group 3, 6%) as the main reasons. Next to these, there is a group stating not have interest / being skeptical (Group 4, 10%) and another group of respondents stating that self-employment is their main reason for not having a PA (21%). We argue that Group 3 and Group 5 lend themselves to be taken into consideration by policy makers, either by information campaigns (especially in rural areas) or by changing the occasion by which a PA is opened, i.e. not a formal employment but rather by default.

The text proceeds by giving a short overview on the related literature and the context in Mexico (section 2), which is followed by a review on empirical works concerning the drivers of household's old-age saving behavior (section 3). Then, we proceed with the descriptive analysis of the data set we use, the categorization and the model employed in this study (section 4). Finally, we present and interpret the estimation outcomes (section 5) before concluding with a brief discussion (section 6).

2. Context and literature overview

Broadly speaking, the pension framework in Mexico can be divided into three categories: 1) non-contributory social pensions where federal and state schemes coexist; 2) mandatory social security pensions (IMSS and ISSSTE); and lastly, 3) voluntary schemes such as company-pension plans and products from financial intermediaries as well as financial assets such as real estate and social aid programs for the elderly. For a more detailed description of the Mexican pension system, see, for example, OECD (2016), Villagomez (2014), and Villareal and Macías (2020).

The second category is of interest to our research because it is the only pillar providing substantive pension payments. Here, pension contributions are linked to formal employment and the attached social security contributions. For most employees, this would be either the IMSS or

the ISSSTE agency, which cover the private and the public sector respectively. Currently, Mexico has a defined-contribution pension system, as many countries in Latin America and elsewhere, see Gutiérrez (2007) and Kritzer (2011). The old pay-as-you-go/defined-benefit pension system was reformed in 1997.

This reform introduced the current system where savings are accumulated in PA's as usual for defined-contribution schemes.[2] These are regulated by the national "System for Retirement Savings", known by its Spanish acronym SAR, and funds in PAs are managed by private sector entities referred to as AFOREs, among which are banks and non-bank financial institutions. When working in the formal sector, employees make compulsory payments and may amend these with voluntary contributions. Informal workers may open their accounts on voluntary initiative. Yet, there is a large group of adults in Mexico without a PA for retirement savings, as shown by the database we use in this text; see below. With the recent reform of the pension system implemented in 2021, a minimum amount of 750 weeks of contributions must be accumulated to receive a pension. These contributions refer to non-voluntary payments, i.e. these are made on behalf of formally employed employees with social security benefits. Before that, the requirement was 1250 weeks (24 years). Moreover, if the statutory pension falls below the threshold of 15 times the minimum wage, pensioners receive a social pension add-on of 7% of their former wage. Moreover, individuals who have started contributing before 1997 and count with at least 500 weeks of contributions (including 5 uninterrupted years) coming from employment with social security benefits are eligible for recurrent pension payments (calculated on the basis of their accumulated savings). This option is also referred to as "modalidad 40".[3]

Voluntary contributions may be made alongside mandatory ones in case an individual is formally employed or as sole contributions by informally employed individuals. For the latter, the default option for voluntary contributing individuals is a one-off payment of savings accumulated in their PA. So, when not accumulating a sufficient number of contribution weeks, for example due to long spans of working informally or self-employed, the PA turns into a savings-account and recurrent pension payments representing a stable source of income are not available for these account holders.

It is natural to assume that the number of accounts grows over time as younger cohorts enter the (formal-sector) workforce, as well as due to persons who switch from the informal to the formal sector. In fact, the number of PA's has grown from roughly 10 million in 1997 (equivalent to IMSS affiliates) to almost 72 million in 2022 (Hacienda, 2022). As accounts are not deleted when entering into the pension age or when individuals leave the formal for the informal sector, the number of PAs is not to be confused with the number of contributors, see Aguila et al.

[2] Individuals who started working prior to July 1997 are referred to as the transition generation. Their pension contributions are accumulated in an IA, yet they can opt for a payout according the old defined-benefit system or the new defined contribution system.

[3] See Rankmi (2024): https://www.rankmi.com/blog/modalidad-40-imss#:~:text=Esta%20modalidad%20est%C3%A1%20dirigida%20a,solicitar%20la%20pensi%C3%B3n%20por%20Vejez. (Accessed January 13, 2024)
and Gobierno de Mexico / PENSIONISSSTE: https://www.gob.mx/pensionissste/articulos/los-trabajadores-independientes-tambien-pueden-obtener-una-pension?idiom=es - :~:text=Si nunca has cotizado para,largo de tu vida laboral (Accessed January 13, 2024)

(2010).[4] In the end, the aim of the 1997 pension reform was to increase contribution coverage as well as to restore financial sustainability of the pension system on the other. At least the latter could be considered to be well underway by implementing a self-funding defined-contribution system with PAs. In fact, assets in PA's, managed by AFOREs, have grown considerably over time relative to GDP, see Figure 1.

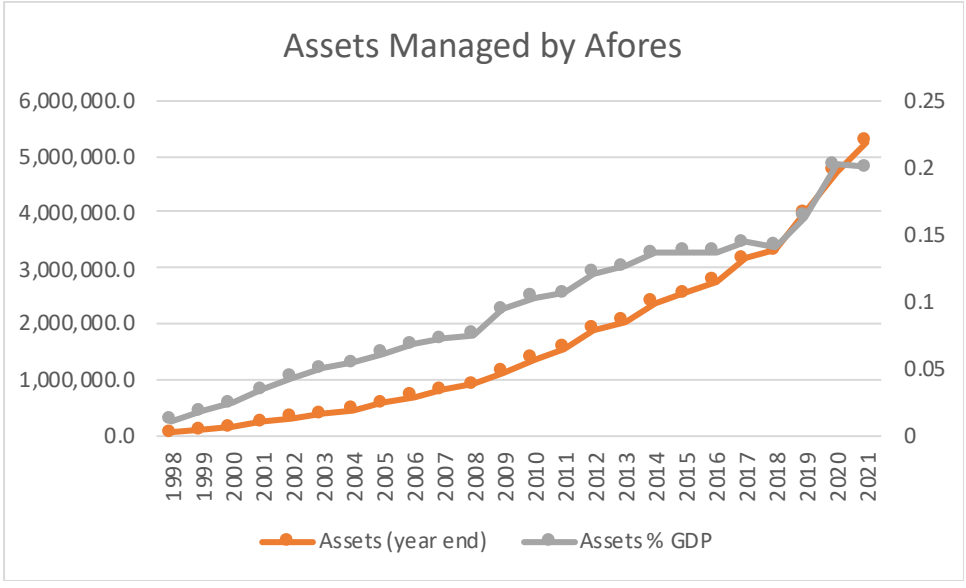

Figure 1: Retirement savings in personal accounts. Authors' own elaboration based on CONSAR and INEGI data.

With respect to contribution and pension coverage, the situation is less positive. In 2018, an average of 30.9% of the population 65 and older received a contributory pension. Yet, differences between states are ample. While pension coverage was only at 8.1% in the southeastern state of Chiapas, in the northern states of Coahuila and Nuevo León, it was close to 52%. Not surprisingly, pension coverage and poverty levels are inversely related (CONEVAL, 2020). Moreover, the ratio of contributors to the economically active population has been stationary between 1996 and 2017, while pension coverage for the group of age 60+ has had a negative tendency, see Figure 2. Incomplete (social security) pension coverage ultimately goes back to low pension contribution rates owed to the large informal sector in Mexico.

[4] In fact, it is even possible that individuals hold more than one account. For example, this may happen when they work for the public as well as for the private sector during their careers. Unfortunately, there are no statistics available on the number of account holders.

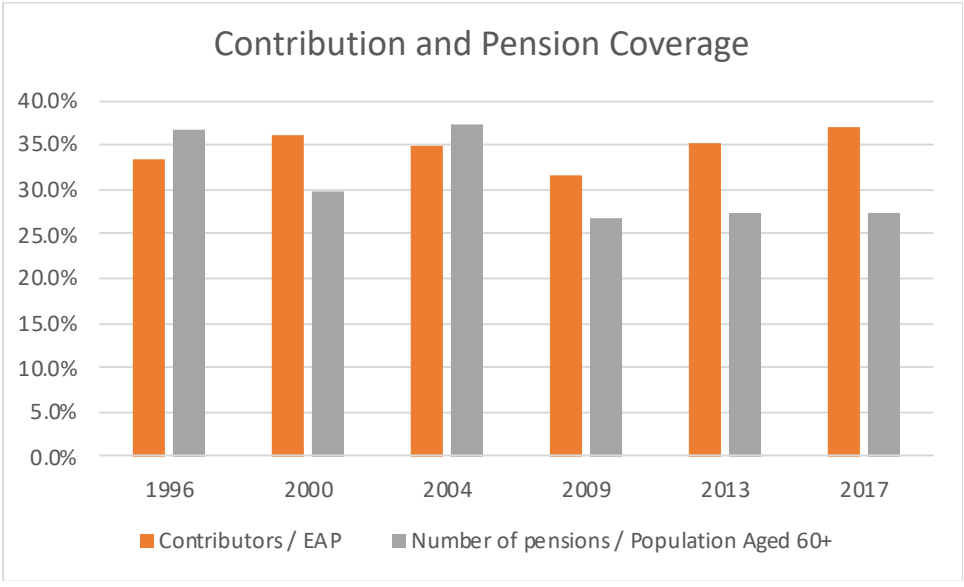

Figure 2: Contribution and pension coverage. Authors´ own elaboration, Contributory coverage according to the number of individuals affiliated to social security, Pension coverage according to the number of individuals reported receiving contributory pension.[5]

According to Melguizo et al. (2017), in 2010 Mexico ranked close to the Latin American average pension coverage, with just over 50% of the population older than 65. including non-contributory pensions, while its contributory pensions only covered some 20%. Yet, when it comes to projected coverage and sufficiency of pensions, the same authors project that between 70%-80% of Mexicans aged 65 and above would not count with an adequate contributory pension in 2050. In the same vein, Alonso et al. (2015) project pension coverage not to improve substantially during the same time horizon. The financial sustainability of the pension system has not improved since the introduction of the defined-contribution system, despite a growth of contributions to the pension system (as % of GDP).[6] That is due to the increase of pension outlays (defined-benefit system). This trend is forecasted to continue in the near future, see Villareal and Macías (2020).

[5] Contributors are paying social security, Only pensions of public entities are counted (IMSS, ISSSTE, others), EAP – economically active population, non-contributory pensions are excluded (Sources INEGI: ENESS 2000, 2004, 2017, INEGI Census Data (2022) from 1995,2000,2005,2010 and 2020 – linearly interpolated). See also Tables XX and XX in the Appendix. We confirm data of Aguila et al. (2010) and Villagomez and Ramirez (2013), but report higher pension coverage than Alonso et al. (2014) and lower contribution data than Villareal y Macías (2020).

[6] During the period of 2000 and 2017, pension contributions only amounted to 6-8% of pension outlays, with no trend showing towards rising coverage.

Obviously, the large informal sector in Mexico is interfering with the policy goal of increasing contributions coverage and, therefore, also putting the sufficiency and coverage of pensions in old age in jeopardy. In 2021, an estimated 32 million individuals work in the informal economy out of 59 million who constitute the economically active population (INEGI, 2022). DaCosta et al. (2011) show that contribution and pension coverage are inversely related to the degree of informality among different social groups in Mexico and other Latin American countries.

As mentioned earlier, working in the informal sector translates into an interruption of contributions to a person's PA, or, worst case, no PA is opened at all. In fact, the number of accounts (72 million) falls short of the population 15 and older, which amounted to 99 million in 2021 (INEGI, 2022), while some individuals may have more than one account. Moreover, a large portion of PA's – a weighted average of over 50% - counts with 200 or fewer weeks of contributions falling short of the current minimum requirement of 750 weeks. Aguila et al. (2010) find that low contribution coverage is not only prevalent in Mexico but also in Colombia and Chile, where the latter is known for pioneering defined-contribution pensions.

In Mexico, the overall situation of proactive saving for retirement looks dire: in 2011 only 57% of households saved money at all (CONSAR, 2014), but mainly for precautionary purposes and the effective savings rate in relation to GDP, as estimated by Gandelman (2015), is a mere 3% and one of the lowest among Latin American countries. Those individuals who did not save reported having too low (real) incomes to do so (CONAPO, 2017, Ch. 5; CONSAR, 2014). While the latter problem is out of the scope of pension policy, the former could be targeted by channeling savings into retirement accounts. In fact, those who save for retirement mainly use individual retirement accounts. Yet, a strong prevalence of a lack of planning for retirement, relying on working at old age as well as support from family, friends, and government aid leads to a low degree of (financial) preparedness for retirement and consequently to vulnerability and old age poverty, see CONAPO (2017, Ch. 6) and CONEVAL (2020).

3. Empirical evidence on variables explaining insufficient savings for old age

We approach the analysis of the population without PA's by motivating our choice of explanatory (exogenous) variables. The variables we identified in the literature are financial literacy, informal (vs. formal) employment, gender, living accompanied (vs. living alone), level of education, living in rural areas (vs. urban areas), and finally, cell phone ownership. To better motivate our choice, we briefly review findings in the literature related to our research question regarding these variables.

Financial literacy is low worldwide and the same applies to Mexico and Latin America (Arceo-Gomez and Villagomez, 2017; Mendez Prado et al.,2022).[7] Moreover, there is ample evidence that low financial literacy is correlated with, if not causing, insufficient or even non-existent savings for retirement. Our brief and non-exhausting literature review focuses on evidence from non-high-income countries or Latin America. For example, in their analysis of Chilean data,

[7] For global evidence see Lusardi and Mitchell (2007, 2011a, 2011b).

Landerretche and Martínez (2013) find that having a pensioner in the household (representing knowledge of the pension system) elevates the chances of saving for old age, but not through the pension system. Studying data from Ghana, Baidoo et al. (2018) find that financial literacy positively affects old-age savings. For the case of Kenya, Gitari (2012) presents evidence that shows a positive effect of financial literacy on retirement planning and the amounts that are saved. While in their study of the informal sector also in Kenya, Githui and Ngare (2014) again find that financial literacy has a positive impact on retirement planning.

For Mexico, Garcia (2021) finds that among individuals aged 18-35, financial literacy promotes an active way of confronting pension planning, meaning saving with a PA or other investments, as opposed to relying on family and government. With respect to the present study, the lack of knowledge, interest, or trust with respect to the pension (savings) system in Mexico is reflected by the large number of respondents stating answers pointing into these directions as the reason for not having a PA for retirement saving (see below).

Next to financial literacy, the literature identified informal employment as inhibiting retirement savings. DaCosta et al. (2011) study five Latin American countries and find that labor informality and pension coverage are inversely related across percentiles, i.e. labor informality is the lower, the more affluent individuals are, but pension contribution coverage increases. In the same vein, the results of Tuesta (2014) for Latin America indicate the likelihood of receiving a pension by working in the informal sector or by being self-employed.

Sex is another obvious candidate to explain saving behavior (or access to pensions) due to notable differences in labor market participation, for example. The analysis by Nava Bolaños et al. (2016) on elderly Mexicans may be closest to the context studied in this paper. They find that being a woman significantly reduces the likelihood of receiving a pension or enjoying economic security at old age. The findings of Landerretche and Martinez (2013) are seemingly contrary. They highlight that being male makes it less likely to save (for a pension). However, pensions received from the public pension systems, which fall into category 2 as detailed in Section 2, typically do not reflect voluntary savings efforts but instead signify participation and access to formal labor markets.

However, Tuesta (2017) finds that gender is not significant for explaining how much an individual saves for retirement using the same series of surveys as Nava Bolaños et al. (2016), yet for earlier years.[8] The results of Garcia (2021) point in a different direction, stating that being a woman makes it more likely that an individual pursues a passive pension plan, i.e., help from family and friends rather than from the defined contribution public pension system.

Next, living accompanied or not may also alter the motivation to save. One could think of the motive of caring for a relative or spouse or, on the contrary, viewing family and relatives as a social security net, including for old age, making it less necessary to rely on public institutions such as the pension system. Nava Bolaños et al. (2016) find that living alone increases the probability of receiving a pension, contrary to our findings. In the same vein, Landerretche and

[8] Both studies, Tuesta (2017) and Nava Bolaños (2016), use the Mexican ENIGH survey on household income and expenditures.

Martinez (2013) find that larger households are less likely to save for retirement. Tuesta (2017), on the other hand, reports this variable to be insignificant in explaining retirement savings.

The impact of the degree of education is also frequently considered, as it would explain a better understanding of the need to save or higher income to facilitate saving. Yet, as in the present study, an individual's educational level does not have strong explanatory power, i.e., results are mostly insignificant and, in some occasions, positive (see Tuesta, 2017; Landerretche and Martinez, 2013; Villagomez and Gonzalez, 2014). In that respect, Arceo-Gomez and Villagomez (2017) highlight in their work with data on high school students in Mexico City that financial education is low, indicating that with increasing levels of education, financial education does not grow.

Finally, it is widely known that the rural areas of an emerging economy, as in the case of Mexico, are characterized by less financial inclusion. So, it would be logical to assume that pension coverage and pension saving are negatively affected when an individual does not live in an urban area. In fact, Nava Bolaños et al. (2016) find that individuals aged 65 and older are more likely to receive a pension when living in urban areas, though they also find that this decreases the likelihood of enjoying economic security (probably due to low coverage rates and high costs of living). And in a study on the case of Peru, Olivera and Clausen (2014) note that poor elderly people often live in rural, mountainous areas and that only 1% living in extreme poverty have access to pensions. On the other hand, for Mexico, Villagomez and Gonzalez (2014) find that living in an urban environment is not significant in explaining the volume of retirement savings.

In our analysis and due to the mixed evidence, we will account for all of these variables (see below). Next to these, and following Landerretche and Martinez (2013), we will also consider cell phone ownership to cover a variable representing access to information concerning the pension system.

4. Modeling

4.1 The Survey

For the analysis of the social security of households in Mexico, the National Survey of Financial Inclusion 2021 (“Encuesta Nacional de Inclusión Financiera”, henceforth ENIF) is used. It contains a section asking respondents questions concerning their PA and is therefore suited for our research question.[9] Said survey was carried out by the Mexican National Bureau of Statistics and Geography (Instiuto Nacional de Estadística y Geografía, INEGI) with the collaboration of the CNBV[10]. The ENIF-Survey is a representative sample of the entire adult population at the national and regional level by size of town and by sex (INEGI, 2022).

[9] SOURCE OF Survey. Section 9 focuses on retirement accounts.

[10] National Banking and Finance Comission (Comisión Nacional Bancaria y de Valores); Government agency under the Finance Ministry of Mexico.

The target population of the survey were adults who permanently resided in their homes within the national territory, so the unit of analysis of the survey was individuals over 18 years of age (INEGI, 2022). The geographic coverage of the effective sample was 13,554 people. Information was collected in localities with less than 15,000 inhabitants (rural) and more than 15,000 inhabitants (urban). The survey period was from June 28 to August 13, 2021.

4.2 Descriptive Statistics

According to data from the ENIF 2021 survey, around 59% of the adult population in Mexico indicates that they do not have a personal account (PA) for retirement savings, which represents a high percentage of the population that would not have the necessary financial resources to face the expenses of the so-called elderly or those over 65 years of age.

Table 1 Percentage of Population without individual retirement savings account

ACCOUNT	FREQUENCY	SHARE IN PERCENT	CUMULATIVE SHARE
NO	7,761	59.08	59.08
YES	5,375	40.92	100.00
TOTAL	13,136	100.00	

Source: Own elaboration based on ENIF 2021.

The results indicate a low access of the adult population to social security, despite being a country with an emerging economy ranked among the 20 largest economies in the world. In the ENIF survey, the most commonly stated reason for not having a PA is not having work or never having worked (44% on non-PA holders), and self-employment ranks next (around 21% of non-PA holders). Of the former, only 19.2% are over 65 years of age and the highest percentage is concentrated in the population under 25 years of age (23.4%). So, a considerable portion could still escape this group, excluded from saving for old age by lack of income, due to the time they have ahead for entering the labor market and opening a PA (Annex 2).

Before we proceed analyzing those individuals who do not have a PA, we present a brief descriptive analysis of independent variables identified in the literature.

Table 2 Descriptive analysis of independent variables

	FREQUENCY	SHARE IN PERCENT	CUMULATIVE SHARE
VARIABILITY OF INCOME			
VARIABLE	4,597	55.7	55.7
FIX	3,656	44.3	100
TOTAL	8,253	100	
EDUCATION LEVEL			
PRIMARY SCHOOL	3,682	27.13	27.13
SECONDARY SCHOOL/VOCATIONAL TRAINING	3,860	28.45	55.58
HIGH SCHOOL	3,055	22.51	78.09
HIGHER EDUCATION	2,973	21.91	100
TOTAL	13,570	100	

CELL PHONE OWNERSHIP			
NO	3,796	27.97	27.97
YES	9,774	72.03	100
TOTAL	13,570	100	
SEX			
FEMALE	7,355	54.2	54.2
MALE	6,215	45.8	100
TOTAL	13,570	100	
AGE			
18-25	2,079	15.32	15.32
26-35	2,962	21.83	37.15
36-45	2,761	20.35	57.49
46-55	2,215	16.32	73.82
56-65	1,747	12.87	86.69
65 AND OLDER	1,806	13.31	100
TOTAL	13,570	100	
RECORDING OF EXPENSES			
NO	9,424	69.45	69.45
SI	4,146	30.55	100
TOTAL	13,570	100	
LIVING ACCOMPANIED			
SINGLE	5,626	41.46	41.46
ACCOMPANIED	7,944	58.54	100
TOTAL	13,570	100	
LOCALITY (INHABITANTS)			
LESS THAN 15,000	4,996	36.82	36.82
ABOVE 15,000	8,574	63.18	100
TOTAL	13,570	100	

Source: Own elaboration based on ENIF 2021.

Considering the economic variables (variability of income, education, and cell phone ownership), 55% of the population has a variable income, which we take as a proxy for working in the economy's informal sector. In most cases, this does not allow planning expenses or a savings plan such as regular transfers to a PA. Moreover, informal employment does not prompt the opening of a PA, and individuals would have to take the initiative.[11] Next, reporting of educational levels concentrates on the two lower categories, primary and secondary schooling, with 27% and 28% respectively, indicating a high prevalence of low educational levels among Mexicans. On the other hand, cell phone ownership is widespread (72% of respondents), which can facilitate transactions. Yet, in comparison to high-income countries, this figure seems to fall significantly short of potential (full) coverage and leaves a considerable number of Mexicans with limited access to the associated benefits.[12]

[11] However, as PAs are not closed when leaving formal employment for working informally, some individuals in the informal economy might hold a PA an could potentially contribute voluntarily.

[12] In 2021, the Pew Research Center reports that 97% of US Americans own a cell phone (See https://www.pewresearch.org/internet/fact-sheet/mobile/, accessed Jan 27th, 2023).

Regarding the behavioral economics variables (sex and age), 54% of the surveyed population is female, and it is expected that there is a greater probability that they do not have a PA for retirement. We infer this from observing the marginalization they suffer including low (formal) labor market participation and hence low personal income levels. Observing the age structure of the ENIF 2021 sample, the majority of respondents are under 45 years (57.5%), meaning that they still have a long period of (potential) economic activity and income generation ahead. Yet, when looking at habits associated with financial literacy, we observe that a vast majority of c.a. 70% do not keep a record of their spending, which confirms a low financial literacy and 58.5% live with someone else, which may encourage having a PA.

Finally, regarding the variables considered within institutional economics (population size of locality), a notable portion of 37% lives in towns or villages with fewer than 15,000 inhabitants. Living in rural areas (with small settlements) may discourage said population from having a PA, given the transaction costs they incur in comparison to those living in greater cities.

4.3 The Model

As mentioned earlier, we focus on Section 9 of the ENIF 2021 survey. Therein, the answers to question 9.2, which is asking "What is the main reason due to which you do not have an individual account for retirement savings?", constitutes for us the dependent variable. The questionnaire offers the respondents nine, non-ordinal answer categories, which we deal with below. Hence, the dependent variable being multi-categorical, we apply a multinomial logistic model.

The multinomial logistic model is an extension of the binomial logistic model and can be thought of as a simultaneous and binary estimation. Independent variables can be continuous or categorical. The dependent variable in this research is categorical, grouped into five possible answers (González, 2019).

The model, put in simple terms, estimates the probability that the i^{th} agent chooses the k^{th} category, based on a comparison of other categories. For convenience, often times a base or referential category is chosen. With such a reference category, the probability of choosing another category can be indicated, using a set of binomial models where the options to choose are only the chosen category and the base.

In a formal way we point out, assuming that there are only three categories, of which we consider the K category as the reference and compare it with 1 and 2, then, the model is expressed:

$$\ln \frac{\Pr(Y_i = 1)}{\Pr(Y_i = K)} = \beta_1 X_i$$

$$\ln \frac{\Pr(Y_i = 2)}{\Pr(Y_i = K)} = \beta_2 X_i$$

The sum of the probabilities must be equal to 1. The distribution associated with the multiple-choice model is logistic, in which the choice of an option is modeled following the aforementioned expression, and the evaluation of the equations for each alternative variable

constitutes a set of probabilities that the individual has to choose, subject to their own characteristics (Long, S. and Freese, 2014).

4.4 The construction of the dependent variable

The dependent variable is taken from question 9.2 in the ENIF 2021, where participants are asked for the main reason for not having a PA. It contains nine answer categories, which we condensed into five categories to facilitate their interpretation and analysis (Annex A.1).

To form the dependent variable, it was necessary, based on the literature, to group it into five categories; but in addition, statistical tests were carried out to validate its conformation. Therefore, the alternative combination test was carried out, which is indicated below (Long and Freese, 2014).

In order to determine the validity of the regrouping of the dependent variable answer categories, the Wald combination test of alternatives is used (see Table A2 in the Appendix). The results indicate that the alternatives are distinguishable at a confidence level of less than five percent, which confirms that the construction of the dependent variable. Finally, we carried tested for independence of irrelevant alternatives. Appendix A.3

Table 3 shows descriptive statistics for the 5 condensed answer categories. According to the evidence from the ENIF 2021, the main reason for not having a PA for retirement is that they do not work or have never worked, which represents 45% of all respondents that answered this question[13]; followed by the option of being an independent worker with around 21% and in third place with the reason that "does not know" (17.49%), see Table 3.

Of the main reasons stated for not having a savings account, we will use the first as a reference category to identify the variables that explain the behavior of the other categories of people who do not have a PA.

Table 3 Answer categories for the reason for not having a personal savings account

Answer Nº	Main reason for not having a PA for retirement: categories	Frequency	Share in percent	Cumulative share
1	Not working or has never worked	2938	45.08	45.08
2	Does not know	1140	17.49	62.57
3	Insufficient income	387	5.94	68.5
4	No interest; distrust	668	10.25	78.75
5	Self-employed	1385	21.25	100
	Total	6,518	100	

4.5 Choice of independent variables and application of the multinomial logistical model

The independent variables are supported by a literature review that explains why an adult person does not have a PA for retirement. To cover the distinct strands of literature, we include variables covering (traditional) economic theory, behavioral economics, and institutional economics, see Table 4. Income as such was not considered since it already appears in one of the answer categories of the dependent variable.

[13] Respondents with a PA for retirement where excluded from question 9.2.

Table 4 Independent variables and their classification

CATEGORIES	TRADITIONAL ECONOMIC THEORY	BEHAVIORAL ECONOMIC THEORY	INSTITUTIONAL ECONOMIC THEORY
VARIABLES	1. Formal education	3. Financial Literacy	8. Income variability.
	2. Cell phone	4. Recording expenditures	9. Home Location
		5. Sex	
		6. Age	
		7. Living accompanied	

At first, nine independent variables were considered, and the multinomial logistic model was run, to proceed to eliminate those non-significant variables, based on the statistical significance test and Wald. Two prominent variables from the literature of saving for retirement, "financial literacy" and "informal working conditions" – the latter is represented by "variable income" – ended up being insignificant in explaining the probability for an individual to fall into a category different from the baseline ("not working"). Based on the that, we ran the model again, identifying and determining the final list of independent variables explaining why people do not have a retirement savings account. Table 5 shows that all entries in the final list of seven independent variables pass the probability index test (LR) and the Wald test for significance.[14]

Table 5 Probability Index (LR) and Wald test for independent variables

PROBABILITY INDEX (LR) TEST FOR INDEPENDENT VARIABLES				WALD TEST FOR INDEPENDENT VARIABLES		
VARIABLES	chi2	df	P>chi2	chi2	df	P>chi2
EDUCATION LEVEL 2	11.939	4	0.0180	11.908	4	0.0180
EDUCATION LEVEL 3	25.94	4	0.0000	25.765	4	0.0000
EDUCATION LEVEL 4	52.266	4	0.0000	51.588	4	0.0000
RECORD. EXPENSES	44.153	4	0.0000	44.11	4	0.0000
SEX	758.461	4	0.0000	676.34	4	0.0000
LOCATION: URBAN	37.407	4	0.0000	37.015	4	0.0000
AGE 26-35	115.252	4	0.0000	111.141	4	0.0000
AGE 36-45	142.366	4	0.0000	135.802	4	0.0000
AGE 46-55	149.514	4	0.0000	144.091	4	0.0000
AGE 56-65	134.11	4	0.0000	129.906	4	0.0000
AGE 65 AND OLDER	76.642	4	0.0000	75.061	4	0.0000
CELL PHONE OWNERSHIP	19.127	4	0.0010	19.042	4	0.0010
LIVING ACCOMPANIED	26.849	4	0.0000	26.784	4	0.0000

Note: Own elaboration Stata V. 15, with n of 6518. Command: mlogtest, lr and mlogtest, wald

5. Results and discussion

Now we turn to the proper model results (Table 6), i.e. the probability ratios of the independent variables in each category and their interpretation. The results are to be interpreted as follows: An odds ratio greater than 1 indicates that the probability of the result falling into the comparison class relative to the probability of the outcome falling into the reference group or class increases as the variable increases. In other words, the outcome of the comparison is more likely. Likewise, an odds ratio of less than 1 indicates that the probability of the result falling into the comparison group relative to the probability of the result falling into the reference category decreases. That is, it is more likely to belong to the reference category.

[14] See Long and Freese (2014, p. 401)

To facilitate the interpretation, we proceed to compare each groups 2 to 5 with group 1, i.e. with the reference group (see table below).

Table 6 (Part I) Estimation results of multinomial logistical model

(1) NOT WORKING (BASLINE CAT.)	(2) NO KNOWLEDGE			(3) INSUFFICIENT INCOME		
IND. VARIABLE	RRR	with	P>|z|	RRR	with	P>|z|
EDU. LEVEL						
SECONDARY	0.9889547	-0.110	0.911	0.9517971	-0.340	0.733
HIGH SCHOOL	0.7976435	-1.830	0.067	0.8593659	-0.800	0.426
HIGHER EDUCATION	0.8312762	-1.320	0.187	0.817051	-0.900	0.371
CELL PHONE						
YES	0.8506898	-1.790	0.074	0.9519494	-0.370	0.710
SEX						
MALE	3.533357	16.220	0.000	4.363291	12.840	0.000
AGE GROUPS						
26-35	1.554125	3.880	0.000	3.379725	5.550	0.000
36-45	1.241379	1.700	0.089	4.837945	7.100	0.000
46-55	0.9365051	-0.470	0.639	3.562847	5.350	0.000
56-65	0.7905214	-1.610	0.108	3.45604	5.170	0.000
OVER 65	0.6698607	-2.800	0.005	2.18559	3.170	0.002
RECORD. EXPENSES						
YES	1.626991	5.520	0.000	1.192854	1.190	0.232
LIVING ACCOMPANIED						
ACCOMPANIED	0.6992684	-4.560	0.000	0.6841265	-3.220	0.001
LOCALITY						
OVER 15,000	0.833848	-2.400	0.016	0.8248704	-1.650	0.099
CONSTANT	0.3632803	-7.540	0.000	0.0423773	-13.300	0.000

Table 6 (Part II) Estimation results of multinomial logistical model

(1) NOT WORKING (BASLINE CAT.)	(4) NOT INTERESTED OR DISTRUSTFUL			(5) SELF-EMPLOYED		
IND. VARIABLE	RRR	with	P>|z|	RRR	with	P>|z|
EDU. LEVEL						
SECONDARY	1.46958	2.850	0.004	1.19738	1.920	0.055
HIGH SCHOOL	1.776612	3.770	0.000	1.198912	1.570	0.117
HIGHER EDUCATION	2.627169	6.060	0.000	1.359288	2.370	0.018
CELL PHONE						
YES	1.313751	2.240	0.025	1.241739	2.510	0.012
SEX						
MALE	4.59955	16.230	0.000	5.735555	23.520	0.000
AGE GROUPS						
26-35	2.308232	6.080	0.000	3.194038	9.360	0.000
36-45	1.833125	3.730	0.000	3.799839	10.130	0.000
46-55	2.293126	5.050	0.000	4.092034	10.360	0.000
56-65	1.58417	2.500	0.012	3.812063	9.550	0.000
OVER 65	1.708911	2.970	0.003	2.495413	6.310	0.000
RECORD. EXPENSES						
YES	1.675696	5.010	0.000	1.375758	3.670	0.000
LIVING ACCOMPANIED						
ACCOMPANIED	0.8011102	-2.260	0.024	0.8574312	-2.040	0.041
LOCALITY						
OVER 15,000	1.472846	4.040	0.000	1.152563	1.950	0.051
CONSTANT	0.0359323	-18.390	0.000	0.0684705	-18.840	0.000

Group 2: “No knowledge”.

This group, representing 17.5% of ENIF 2021 respondents without PA, is younger than the reference group ("Not working") and younger than the other groups stating other reasons, i.e. aging 18-35 makes it more likely to fall into group 2. In addition, being male (instead of female) makes it more likely to fall into this group rather than in the reference group. This also holds for the other groups but with higher odds ratios. Thus, if "not working" does not apply to them, women are most likely to answer "I don't know". And finally, individuals of group 2 are more likely to live in a small towns or villages than the reference group (and groups 3 and 4).

As with the other non-reference groups, we find that individuals, who record their expenses, are more likely to be in this group rather than in the reference group. Thus, not being able to rely on the option of a social security pension (due to ignorance), individuals are more likely to control their expenses and likely have some financial discipline.

Finally, the odds ratio of the variable "living accompanied" tells that those who do not know about retirement PA's are more likely to live by themselves than the reference group. It is imaginable that living alone reduces the opportunity for learning about PA's (there is no partner to share knowledge) or that individuals living by themselves are not seeking information because they have no spouse or other company for whom they would do the effort of financial planning. Keep in mind that the reference group states that they are not working and are more likely to be women than men. Hence, we can infer that the reference group holds many women likely being housewives. They could as well be covered by their spouse's (future) pension or put the decision of having a PA into the hands of their spouse.

We expected that the educational level and cell phone ownership would reduce the probability of not knowing about retirement PA's. However, though the odds ratios point into this direction, the effects are not significant. Hence, we infer that ignorance in context is not so much a problem of education or access to information per se, but rather a problem of male individuals, living by themselves (with fewer or less clear future plans) in rural areas (with high informality and far from outlets of financial institutions).

Group 3: Too little income.

This group, representing only about 6% of non-PA-holding respondents, is somewhat similar to group 2. Being male, living in rural places, not living accompanied, and keeping track of expenses all increase the probability of an individual falling into this group versus the reference group. A difference is found in the role played by age. Falling into any age group above 18-25 makes it more likely to report "too little income" as the main reason as opposed to not working, meaning that this group is notably older than the reference group. Our interpretation is that the reference group, consisting of more female and younger individuals, who do not participate in the labor market (as often) and who are dedicated to activities in the household (more attributed to women) or attending educational training (both sexes). At a later age, individuals in ENIF 2021 are more likely to work. When also living in rural areas, the low income disincentivizes opening a PA for retirement.

Moreover, a reason for all ages is certainly that the poverty situation manifests itself as permanent. In Mexico, we observe a low degree of income mobility. Moreover, living in smaller

communities gives less of an opportunity to reach higher income levels at later career stages, given that there are fewer formal workplaces, less professional education that would elevate productivity, dominance by the agricultural sector (low wages), and scarcity of job offerings by large enterprises.

Similar to the group not knowing about PA's for retirement (Group 2) is the insignificance of education and owning a cell phone. This is likely to the lack of (better paying) job opportunities for higher educated / highly communicated individuals.

Group 4: No interest or lack of trust.

This group (10.25% of ENIF respondents without PA) is notably different from the first two that we discussed above. First, all educational levels higher than primary school (most strongly higher education) make it more likely to fall into this group. On the one hand, this seems to confirm that financial literacy is low in general, and schooling seems not to improve it as outlined in the literature review, while higher education could also lead to distrust or skepticism. Awareness of weaknesses of institutions or historical incidences, which come with higher education, could be a reason why higher education is found to raise the probability of responding with "no interest/distrust". On the other hand, higher education might also promote broadening the scope of alternatives considered for retirement saving (e.g. real estate or other financial instruments).

Next to that, for this group, we find that cell phone ownership is significant and raises the probability of falling into this group. It can be interpreted that a cell phone allows for better access to information to alternatives to saving via PA.

Moreover, as group 3, being older than 25 in all age groups raises the likelihood of not being interested or not trusting. Again, it portrays the difference in age structure between the reference group and this one, where individuals eventually leave the household for work.

The same holds for "recording expenses". Individuals in group 4 appear to be more financially aware, possibly due to their assumed adequate income, which in turn could motivate the use alternative savings methods. This suggests that they manage their expenses more diligently than the reference group. Yet, the survey does not inquire whether respondents are making use of alternative forms of saving for retirement.

We also find respondents of this group to live accompanied less than the reference group, pointing towards less long-term orientation or care-taking behavior inducing less financial planning for the future.

And finally, living in larger urban dwellings is also significantly raising the chance of reporting lack of interest or trust. It could mean more access to a variety of saving instruments or seeing different saving patterns in these individuals' peer groups.

This group should be of interest to the institutions of the financial intermediaries managing PAs for retirement (as well as to policymakers) since it represents an opportunity to promote their services; since people in this group can be assumed to have sufficient income to save. On the other hand, lack of interest or distrust can be serious obstacles when it comes to winning these

individuals to open a PA. The ENIF survey does not allow for any clues regarding the specific (possibly) idiosyncratic reasons, such as deep mistrust towards public social security programs or a high discount rate due to institutional instability.

Group 5: Self-employed

This final group, a large group accounting for 21.3% of respondents without PA, is again similar to Group 4. In comparison to the reference group, it is older, higher educated, rather living in more populated urban areas (though its odds ratio is lower than for group 4), more likely to live unaccompanied, including much more men than the reference group, and more likely to be owning a cell phone.

When interpreting the effects of the significant variables, recall that opening a PA for retirement in Mexico is by default when working in the formal sector (as an employee)[15] and upon own initiative when working informally. So, the self-employed are carrying the responsibility of opening their PA. From there, and observing that this is the largest of the non-reference groups, it could be seen as a deficiency of program design that these individuals do not have a PA for retirement savings. This group does not report major obstacles such as lack of income, lack of interest, or distrust. Hence, there might be potential to increase PA ownership by addressing this group through program design changes.

Other than that, the interpretations we gave of group 4 (identical list of significant variables, the same direction of effects) are slightly reformulated for this group. Instead of calling distrust, we argue that for this – considerably larger group – education and access to information do not sufficiently trigger financial education or interest in opening a PA.

6. Conclusions

The main results show that among individuals not having a PA for retirement savings, the stated reasons and the characteristics vary substantially. The majority of respondents seems to be out of scope of the category-2 pension system (saving via a PA). There is a large group (c.a. 45%) not participating in the (formal) labor market, where individuals tend to be female, while all the other groups tend to be more male. Then there are two groups (together c.a. 23%), where individuals do not consider opening a PA since they either have not been exposed to pension-related information or for whom it is impossible to save. On the other hand, there are two larger groups (together c.a. 32%) which decide not to open a PA despite having the means, either due to lack of interest, or trust, or due to being self-employed (unpredictability of income).

These two latter groups, which could be considered to be within reach for old-age saving via a PA, are more likely to be men and live alone and in urban locations having enough income to be able to save for retirement. However, they make the decision not to have a PA because they do not see benefits or advantages of it. There is a great opportunity for institutions to explain the advantages of having a PA, such as regulation focused on consumer interests such as the

[15] More precisely, that holds for jobs with social security adscription.

widespread availability across financial institutions, a transparent product design, and competition among AFORES in connection with the ease of migrating a PA from one AFORE to another. On the other hand, some may favor the option of receiving a recurrent pension payment, but are not eligible (see Section 2). Making this option available and thus offering a product mimicking a pension of formally employed individuals with social security benefits could potentially make PA's more attractive. In the end, this feature would make a difference in comparison to other forms of saving for old age (such as home ownership).

Our results show that there is a great opportunity to carry out public policy actions that encourage a large share of people who do not have PA. It is more than 50% are not PA owners due to bureaucratic hurdles (no default account opening) or lack of knowledge. The fact that these two groups possess the economic ability to save for retirement and improve their financial situation and resilience in old age should be taken as an impulse for policy action departing from the defined contribution system. The reference group and those reporting too low incomes require different policy instruments. Their massive joint share among respondents indicates the requirement for large-scale policy action, such as the scaling up of social pension systems.

We elaborated above that financial literacy is widely discussed in the literature and found to encourage savings (though not necessarily using a PA). We found that it does not explain the likelihood of stating one of the reasons for not having a PA. However, the notion of financial literacy is broad and likely not capable of raising awareness of the necessity to save for old age. So, with regard to public policies, it is relevant to promote greater financial education, especially to show the advantages of obtaining higher income in old age if you have a savings account for retirement and that sufficient confidence is generated as well as guaranteeing a minimum average return above other savings instruments.

WORKS CITED

Acosta, O. L., & Ramírez Jaramillo, J. C. (2004). Las redes de protección social: modelo incompleto. cepal.

Aguila, E., Attanasio, O. P., & Quintanilla, X. (2010). Cobertura del sistema privado de capitalización en Chile, Colombia y México (No. WR-642).

Consejo Nacional de Población (2017): Vejez y Pensiones en Mexico URL: https://www.gob.mx/conapo/documentos/vejez-y-pensiones-en-mexico (Accessed Nov. 8th 2022)

Alonso, J., Hoyo, C., & Tuesta, D. (2015). A model for the pension system in Mexico: diagnosis and recommendations. Journal of Pension Economics & Finance, 14(1), 76-112.

Antón, J. I., de Bustillo, R. M., & Fernandez-Macias, E. (2014). Supplementary private pensions and saving: evidence from Spain. Journal of Pension Economics & Finance, 13(4), 367-388.

Arceo-Gomez, E. O., & Villagómez, F. A. (2017). Financial literacy among Mexican high school teenagers. International Review of Economics Education, 24, 1-17.

Azuara, Bosch, García, Kaplan, and Silva (2019), Diagnóstico del sistema de pensiones mexicano y opciones para reformarlo, Banco Interamericano de Desarrollo (BID),, Retrieved Nov. 16, 2022, from https://publications.iadb.org/es/diagnostico-del-sistema-de-pensiones-mexicano-y-opciones-para-reformarlo

Barajas, A., Beck, T., Belhaj, M., & Naceur, S. B. (2020). Financial inclusion: What have we learn so far? What do we have to learn? IMF Working Papers 20/157. URL: https://www.imf.org/en/Publications/WP/Issues/2020/08/07/Financial- Inclusion-What-Have-We-Learned-So-Far-What-Do-We-Have-to-Learn-49660 (Accessed: Feb 14th, 2023)

BBVA Research (2020), Retrieved from https://www.bbvaresearch.com
Beck, T., Demirguc-Kunt, A., & Honohan, P. (2009). Access to financial services: Measurement, impact, and policies. World Bank Research Observer, 24(1), 119-145.
Blasco, N., and Ferreruela, S. (2017), Behavioral finance: ¿Por qué los inversores se comportan como lo hacen y no como deberían? BME.
Börsch-Supan, A., Reil-Held, A., & Schunk, D. (2007). The savings behaviour of German households: First Experiences with state promoted private pensions. MEA Discussion Papers, 136.
Bosch, M., Caballero, G., Cofré, F., González, S., Hand, A., Keller, L., ... & Rodríguez, C. (2020). Ahorro Previsional Voluntario: Experiencia del Laboratorio de Ahorro para el Retiro en América Latina y el Caribe. Gestión y Tendencias, 5(1), 7-10.
Bustamante, R. (2014). Modelos de Elección Nominal. Aplicaciones en Stata 14. Lima. UNMSM.
Carangi, P., Garbay, J., and Valencia, B. (2017), "Finanzas Personales: la influencia de la edad en la toma de decisiones financieras", Revista Killkana Sociales., 1 (3), 81-88.
CONAPO (2017) Vejez y Pensiones en México. Consejo Nacional de Población. URL: http://www.geriatria.salud.gob.mx/descargas/publicaciones/Vejez-pensiones-en-Mexico.pdf (Accessed Nov. 10th 2022)
Comisión Nacional Bancaria y de Valores (CNVB, 2022), Encuesta Nacional de Inclusión Financiera (ENIF) 2021:Reporte de Resultados, Retrieve 06 de octubre 2022 https://www.cnbv.gob.mx/Inclusi%C3%B3n/Anexos%20Inclusin%20Financiera/Reporte_Resultados_ENIF_2021.pdf
CONEVAL (2020) Pobreza y personas mayores en México. Consejo Nacional de Evaluación de la Politica de Desarrollo Social. URL: https://www.coneval.org.mx/Medicion/MP/Documents/Pobreza_y_poblacion_mayor_Mexico.pdf
(Accessed Nov. 10th 2022)
CONSAR (2014) Ahorro y futuro: ¿Cómo piensan los mexicanos? - Encuesta sobre Cultura de Ahorro para el Retiro, 2011., Comisión Nacional del Sistema de Ahorro para el Retiro. URL: https://www.gob.mx/cms/uploads/attachment/file/66763/Encuesta_2011.pdf (Accessd Nov. 15th 2022)
CONSAR (2022) Información Estadística, Comisión Nacional del Sistema de Ahorro para el Retiro, http://www.consar.gob.mx/gobmx/aplicativo/siset/Series.aspx?cd=141&cdAlt=False (Accessed Nov. 8th 2022)
Cull, R., Ehrbeck, T., & Holle, N. (2014). Financial inclusion and development: Recent impact evidence. CGAP. URL: https://www.cgap.org/sites/default/files/FocusNote-Financial-Inclusion-and -Development-April-2014.pdf (Accessed: Feb 14th, 2023)
Demirguc-Kunt, A., Klapper, L., & Singer, D. (2017). Financial inclusion and inclusive growth: A review of empirical evidence. Banco Mundial. Policy Research Working Paper 8040. Obtenido de https://documents1.worldbank.org/curated/en/403611493134249446/pdf/WPS8040.pdf
Gandelman, N. (2015). A comparison of saving rates: micro evidence from seventeen Latin American and Caribbean countries (No. IDB-WP-602). IDB Working Paper Series.
García, O. (2021). The effect of financial literacy and gender on retirement planning among young adults. International Journal of Bank Marketing.
González-Nuñez, José C. (2019). Los determinantes de la conducta financiera para no tener una cuenta de ahorro formal: aplicación de un modelo logístico multinomial. Revista De Economía, Facultad De Economía, Universidad Autónoma De Yucatán, 36(93), 90-117. https://doi.org/10.33937/reveco.2019.110
Gujarati, D., and Porter, D. (2010), Econometría (quinta edición). México: Editorial Mc. Graw Hill.
Gutiérrez, M. A. (2007). Savings in Latin America after the mid 1990s: determinants, constraints and policies. ECLAC.
Hacienda (2021) Estadísticas del Registro Electrónico de Planes de Pensiones 2021, Secretaria de Hacienda Publica y Crédito Publico, URL: https://www.gob.mx/cms/uploads/attachment/file/686015/21-10-21_Estadi_sticas_SIREPP_2021__PPT_.pdf (Accessed Nov. 8th 2022)
Hacienda (2022) 2022 Informe Trimestral – Abril, Mayo, Junio al H. Congreso de la Unión sobre la situación del SAR. Presidencia, Oficio Num. D00/100/157/2022. URL http://sil.gobernacion.gob.mx/Archivos/Documentos/2022/09/asun_4385187_20220906_1662491111.pdf

Hens, T and Meier, A. (2016), “Finanzas conductuales: la psicología de la inversión. Finance White paper, Credit Suisse AG. URL: https://www.creditsuisse.com/media/assets/private-banking/docs/es/wp-07-behavioral-finance-es. pdf (2016). (Accessed: Feb 14th, 2023)

Hogan, R., and Perrucci, C. C. (2007), "Black women: Truly disadvantaged in the transition from employment to retirement income", Social Science Research, 36, 1184–1199.

Hoyo, C., Pena, X., and Tuesta, D. (2013), Factores de demanda que influyen en la Inclusión Financiera en Mexico, Análisis de las barreras a partir de la ENIF (No. 1336).

Hoyo, C., Peña, X., y Tuesta, D. (2014), Determinantes de la inclusión financiera en México a partir de la ENIF 2012, Documento de trabajo, (14/14)

Instituto Nacional de Estadística y Geografía (INEGI, 2022), Encuesta Nacional de Inclusión Financiera 2021. Nota Técnica (ENIF): México. Retrived from https://www.inegi.org.mx/contenidos/programas/enif/2021/doc/enif_2021_nota_tecnica.pdf

Instituto Nacional de Estadística y Geografía (INEGI; 2022), Encuesta Nacional de Inclusión Financiera 2018: Microdatos (ENIF): México. Retrived from https://www.inegi.org.mx/programas/enif/2021/#Microdatos

Instituto Nacional de Estadística y Geografía - (INEGI, 2022) Encuesta Nacional de Ocupación y Empleo, Nueva Edición (ENOEN) Segundo Trimestre 2022, Nota Tecnica, Instituto Nacional de Estadística, Geografía, URL: https://www.inegi.org.mx/contenidos/programas/enoe/15ymas/doc/enoe_n_nota_tecnica_trim2_2022.pdf (Access Nov. 8th 2022)

Instituto Nacional de Estadística y Geografía (2019), Encuesta Nacional de Ocupación y Empleo (ENOE): Mexico. Retrived from https://www.inegi.org.mx/programas/enoe/15ymas/

Kritzer, B. E., Kay, S. J., & Sinha, T. (2011). Next generation of individual account pension reforms in Latin America. Soc. Sec. Bull., 71, 35.

Lefevre, A. F., and Chapman, M. (2017), Behavioral economics and financial consumer protection. Paris: OECD Publishing.

Long, J. S., and Freese, J. (2001), Regression models for categorical dependent variables using Stata. Stata Press.

Lusardi, A., & Mitchell, O. S. (2007). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. Journal of monetary Economics, 54(1), 205-224.

Lusardi, A., & Mitchell, O. S. (2011a). Financial literacy around the world: an overview. Journal of pension economics & finance, 10(4), 497-508.

Lusardi, A., & Mitchell, O. S. (2011b). Financial literacy and retirement planning in the United States. Journal of pension economics & finance, 10(4), 509-525.

Melguizo, A., Bosch, M., & Pages, C. (2017). Better pensions, better jobs: status and alternatives toward universal pension coverage in Latin America and the Caribbean. Journal of Pension Economics & Finance, 16(2), 121-143.

Méndez Prado, S. M., Zambrano Franco, M. J., Zambrano Zapata, S. G., Chiluiza García, K. M., Everaert, P., & Valcke, M. (2022). A Systematic Review of Financial Literacy Research in Latin America and The Caribbean. Sustainability, 14(7), 3814.

OECD (2016), OECD Reviews of Pension Systems: Mexico, OECD Reviews of Pension Systems, OECD Publishing, Paris, https://doi.org/10.1787/9789264245938-en.

Tuesta, D. (2014). The informal economy and the constraints that it imposes on pension contributions in Latin America. Review of Business and Economics Studies, (4), 18-50.

Tuesta, D. (2017). Retirement and labour markets under the context of pension reform in Latin America. Economic and Political Studies, 5(4), 475-500.

Universidad de California Los Angeles, UCLA, (2019), Institute for Digital Research & Education, Statistical Consulting. Logistic regression Diagnostics. Retrieved from https://stats.idre.ucla.edu/stata/webbooks/logistic/chapter3/lesson-3-logistic-regression-diagnostics/

Vázquez, A. (2015), “Determinantes para participar en el mercado formal de productos financieros: el caso del ahorro y del crédito en México”, Estudios Económicos, CNBV, 3, 79-115.

Villagómez, F. A. (2014). El ahorro para el retiro. Una reflexión para México. El trimestre económico, 81(323), 549-576.

Villagómez, F. A., & Hernández, J. I. (2010). Impacto de la reforma al sistema de pensiones en México sobre el ahorro. Economía mexicana. Nueva época, 19(2), 271-310.

Villagómez and Ramírez (2013), “Más allá de las pensiones contributivas: México”, R. Rofman, I. Apella y E . Vezza (eds.), Más allá de las pensiones contributivas, World Bank.

Villareal y Macías (2020) El sistema de pensiones en México: Institucionalidad, gasto público y sostenibilidad financiera, CEPAL, Macroeconomía y Desarrollo 210. URL: https://repositorio.cepal.org/bitstream/handle/11362/45820/1/S2000382_es.pdf (Accessed Nov. 8th 2022)