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## Financial Literacy and Saving Behavior: Global Cross-Sectional Evidence

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# Financial Literacy and Saving Behavior: Global Cross-Sectional Evidence\*

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January 2026

## Abstract

Savings play a critical role in both individual financial well-being and economic development. This article examines the impact of financial literacy, income, educational level, and age on saving decisions across 136 countries, using data from the Global Financial Inclusion Database (2021) and employing Generalized Structural Equation Modelling (GSEM). Financial literacy is conceptualized as a latent variable, based on five indicators related to financial knowledge, financial behavior, and financial attitudes, aligned with the Organization for Economic Co-operation and Development (OECD) pillars. The analysis demonstrates that financial literacy is a fundamental driver for saving in the short and long term. Education level and income are consistent predictors of savings, while age exhibits distinct effects depending on the savings objective. Regional differences emerge, with Latin American countries showing the strongest link between financial literacy and savings, whereas in high-income economies, its influence is less pronounced. These findings underscore the multifaceted role of financial literacy in shaping saving decisions and highlight its implications for tailored public policies.

**JEL:** D14, G53, I22, C38, O16.

**Keywords:** financial literacy; savings; Generalized Structural Equation Modelling; behavioral economics; global survey.

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## 1. Introduction

Savings have long been a central focus of economic theory, from both microeconomic and macroeconomic perspectives. At the macroeconomic level, household savings play an important role, providing funding for investments in infrastructure, innovation, and other critical areas that support long-term economic growth and development (Keynes, 1936; Solow, 1956; Mason, 1988; Ehigiatusoe & Lean, 2019; Mian *et al.*, 2021). At the individual level, savings decisions are shaped by behavioral and socioeconomic attributes, with financial literacy (Fin Lit) as a key determinant in understanding how individuals manage their finances and their propensity to save (Babiarz & Robb, 2014).

In this regard, the Organization for Economic Co-operation and Development (OECD, 2016) defines Fin Lit as the ability to apply financial knowledge and skills to manage resources effectively and make informed financial decisions. As a form of human capital, Fin Lit equips individuals with the capacity to undertake key financial responsibilities, including budgeting, debt management, and retirement planning (Guan, 2025). For example, a lack of Fin Lit can lead to poor budgeting, overspending, and an inability to plan for future financial needs, directly hindering saving capacity. In economies with high savings rates, resources accumulated by individuals and firms can be channelled to finance infrastructure projects, innovation, and industrial expansion (Carroll & Weil, 1994). Moreover, an adequate level of national savings reduces dependence on external capital, enhancing the economy's resilience to external shocks and contributing to macroeconomic stability. Countries with a robust domestic savings base are also less vulnerable to financial crises, due to their greater ability to sustain consumption and investment during recessions (Aghion *et al.*, 2010; Zucman, 2019).

At the microeconomic level, savings contribute to the financial well-being of individuals, providing a safety net to deal with unforeseen circumstances, such as unemployment, health problems, and reducing the need to resort to high-cost loans or debt (Lusardi *et al.*, 2011; Lusardi & Mitchell, 2014). In addition, savings enable long-term planning and the achievement of important goals, such as buying a property, education or preparing for retirement. From a behavioral perspective, individuals who save regularly exhibit greater financial resilience, improving quality of life and emotional stability (Thaler & Benartzi, 2004).

Despite the importance of savings, the transition of benefits from microeconomics to macroeconomics involves the interaction between individual-level outcomes and broader economic developments. Thus, microeconomic benefits, such as increased productivity and

consumption, can contribute to macroeconomic growth, reduce inequality, and foster sustainable development. However, this transition is not straightforward owing to market failures and behavioral biases that can distort individual decision-making, such as information asymmetries, where the provision of inadequate or overly complex financial products restricts access to effective savings instruments (Stiglitz, 1981). Additionally, cognitive biases such as procrastination, overconfidence, and risk aversion often lead to suboptimal decision-making, including a preference for immediate consumption over saving (Kahneman & Tversky, 1979; Shefrin & Thaler, 2020).

In addition to these issues, many people lack financial knowledge and often have difficulty making decisions due to the absence of the necessary skills to overcome market and behavioral obstacles (Hastings et al., 2013). These challenges help explain why many individuals, even in developed economies, maintain insufficient savings. Thus, in an ideal scenario free of market failures or cognitive biases, Fin Lit would not have the same level of importance, as individuals would naturally make balanced and rational financial decisions.

Expanding upon this growing interest, the OECD has proposed a comprehensive framework for understanding Fin Lit. Rather than limiting the concept to theoretical knowledge, the OECD (2016) highlights Fin Lit as the practical capacity to apply financial knowledge and skills in everyday contexts, enabling individuals to make informed and effective decisions. This perspective incorporates cognitive understanding of financial concepts, prudent financial behaviors, such as regular saving and responsible debt management, and positive attitudes towards financial planning and risk. By adopting this multidimensional approach, the OECD underscores the essential role of Fin Lit in enhancing individual well-being and promoting broader financial inclusion. Lusardi & Mitchell (2014) corroborate this definition and argue that Fin Lit is an investment in human capital with profound implications for individual well-being and public policy.

Nevertheless, given the evolution of new forms of currency, digital transactions and financial mechanisms, Fin Lit is increasingly associated with these emerging technologies, such as digital cards, mobile applications and online banking services. In this regard, the promotion of Fin Lit has a twofold purpose. Firstly, it enhances individual decision-making and resource management. Secondly, it contributes to the stability and resilience of the economy, highlighting that personal savings decisions have wider economic implications.

In light of this, this paper explores the multifaceted nature of Fin Lit and its impact on savings decisions, while also accounting for socioeconomic factors. Despite widespread recognition of the importance of Fin Lit, its measurement remains a challenge. As a multidimensional construct, Fin Lit has been defined differently across the literature (Lusardi & Mitchell, 2008; Atkinson & Messy, 2012), posing significant obstacles to consistent and accurate assessment. Some definitions emphasize knowledge of financial products, whereas others adopt a more comprehensive perspective, encompassing financial behaviors and attitudes.

Consequently, Fin Lit is often treated as a latent variable due to its intangible nature, which limits efforts to measure it accurately. The OECD defines Fin Lit based on three key pillars or dimensions: financial knowledge, financial behavior, and financial attitudes. Financial knowledge refers to an individual's understanding of financial concepts, such as interest rates, inflation, compound interest, and various financial products. Financial behavior involves how individuals manage their money, including budgeting, saving, spending, borrowing, and making financial decisions, and reflects their actual financial practices. Lastly, financial attitudes relate to an individual's values and mindset towards money and financial planning, including their willingness to save and risk tolerance.

To operationalize this indicator, we employ data from the Global Findex Database (Global Findex), which offers comprehensive insights on financial inclusion and Fin Lit across 136 countries in 2021. It is a valuable tool for exploring the relationship between Fin Lit and savings behavior, and how demographic variables such as age, income, and education influence financial decisions in various economic contexts.

Against this backdrop, the research questions guiding this investigation are as follows:

1. What steps are needed to create a Fin Lit construct that aligns the OECD pillars with digital technologies using data from the Findex Global Database?
2. What is the impact of Fin Lit on the various dimensions of individual savings behavior?
3. What is the influence of socioeconomic attributes, such as education, age, and income, as well as the level of economic development of a country, on the decision to save, and what are the policy implications of these factors?

Addressing these questions, this article contributes to the literature in four keyways. First, it expands the understanding of Fin Lit by conceptualizing it as a multidimensional construct comprising financial knowledge, financial behavior, and financial attitudes, aligning with the OECD framework. Given the technological advancements in daily activities, Fin Lit is

inherently linked to digital literacy. Thus, this paper contributes by exploring the Global Findex database and analyzing how variables related to digital technologies influence savings decisions, deepening the understanding of the role of Fin Lit in contemporary contexts.

Covering 136 countries and providing detailed data on financial inclusion and savings of 27 behaviors, 525 adults, the Global Findex stands out as a public and widely accessible source, distinguishing itself from more restricted data sources. This access allows for investigating how Fin Lit relates to savings behavior in dynamic and constantly evolving economic environments.

Second, the article employs Generalized Structural Equation Modelling (GSEM), offering unique flexibility to handle variables with different probability distributions. Moreover, GSEM is particularly valuable for constructing latent variable indicators, such as Fin Lit, which cannot be measured directly. By employing this methodology, the paper examines the complex relationships between observed variables and the latent construct of Fin Lit, providing a precise and robust analysis of the economic and behavioral influences on savings decisions.

Thirdly, the article highlights a link between macroeconomic and microeconomic approaches to savings. While the macroeconomic literature often focuses on household savings to finance investment and growth, this paper emphasizes the transmission channel between the benefits of individual savings decisions, influenced by Fin Lit, and broader economic stability.

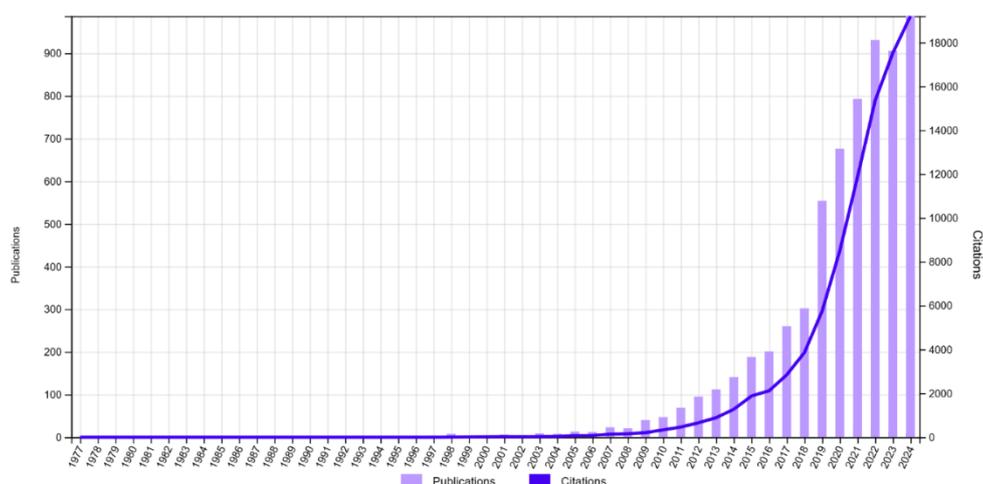
Finally, this study highlights implications for public policies and social interventions by exploring how socioeconomic attributes interact with Fin Lit to shape agents' savings decisions. The findings demonstrate notably that financial literacy is a fundamental driver for saving in the short and long term. Education level and income are consistent predictors of savings, while age exhibits distinct effects depending on the savings objective.

The remainder of the paper is organized as follows. Section 2 presents the literature review. Section 3 presents the data and the econometric strategy. Section 4 reports the empirical analysis, and Section 5 concludes.

## **2. Literature Review**

The growing body of research on financial literacy underscores its increasing importance, as evidenced by the surge in publications and citations in recent years (see Figure 1) and government efforts to promote Fin Lit (Kasman et al., 2018; Agu et al., 2024). In this context, Fin Lit emerges as a crucial element, helping individuals navigate these challenges and make more informed decisions.

**Figure 1. Financial Literacy – Number of Publications (Web of Science Report)**



Source: Web of Science, 2024.

Literature has historically and consistently highlighted savings as a fundamental element in promoting investment and driving economic growth dynamics (Ramsey, 1928; Keynes, 1936; Harrod, 1939; Schmidt-Hebbel *et al.*, 1996; Ehigiamusoe & Lean, 2019; Paşa, & Gherghina, 2022). These studies indicate that, when appropriately channeled, savings play a crucial role in sustaining economic growth. Although savings can support investment, the relationship depends on institutional structures and individual financial decisions.

While previous studies have established the importance of savings for economic growth (Ramsey, 1928; Keynes, 1936), the relationship is complex and contingent on various factors. In this context, Attanasio *et al.* (2000) provide an in-depth analysis of the long- and short-term relationships between savings, investment, and growth, using panel data from 123 countries from 1961 to 1994. The paper demonstrates that lagged savings rates are positively associated with investment rates. Taking it a step further and controlling for a country's level of development, Aghion *et al.* (2006) investigate whether increasing savings can accelerate economic growth. The authors explore this issue both theoretically and empirically. In the theoretical framework, growth is driven by innovations that enable local sectors to converge with frontier technologies. In low-income countries, this process of technological upgrading requires collaboration between foreign investors, who have experience with cutting-edge technologies, and domestic entrepreneurs, who possess knowledge of local conditions.

Given these factors, domestic savings play a crucial role in fostering innovation and growth by providing local entrepreneurs with the necessary equity to engage in these collaborative ventures, thus mitigating agency problems that may deter foreign investment. Conversely, in

high-income countries, domestic entrepreneurs are already proficient in frontier technologies and do not require foreign investment to innovate, rendering domestic savings less influential for growth. Empirical analysis based on cross-country regressions confirms that lagged savings are positively correlated with productivity growth in low-income countries, but not in high-income countries. Burchi *et al.* (2021) reinforce these results and highlight that, among the factors driving sustainable entrepreneurship and economic growth, the entrepreneur's financial education is essential in mediating the relationship between the lender and the borrower.

Providing deeper insights into how savings impact long-term growth, Blanchard & Leigh (2013) emphasized the role of savings in strengthening investment but underline the importance of efficient allocation of savings as a key driver of economic growth. The research reveals that high levels of domestic savings contribute positively to economic stability, particularly in more developed economies with robust financial markets that effectively channel savings into productive investments. In the same vein, Aghion *et al.* (2006) argue that countries with fragile financial systems often struggle to mobilize domestic savings, exacerbating their reliance on external capital for development.

These findings collectively suggest that the impact of savings on economic growth is not uniform; rather, it depends on the economic context, efficient intermediation by financial institutions, and government policies that ensure individual savings translate into sustainable investments. This perspective is supported by Kim & Lee (2020), who find that the relationship between savings and growth is mediated by the maturity of agents and financial markets. The authors argue that while savings can contribute to investment, this transition is notably more pronounced in economies with efficient and well-developed financial systems, particularly in more advanced economies

Lanteri *et al.* (2019) extend this argument, emphasizing that macroeconomic outcomes driven by savings are not merely a result of aggregating individual savings. They are also shaped by institutional factors, government policies, and the knowledge required to interact effectively with the financial system.

Therefore, at the macroeconomic level, although savings are crucial for providing the capital needed to support investment and growth, their impact on macroeconomic outcomes is not always direct or predictable. As Keynes (1936) cautioned, during periods of uncertainty and economic volatility, a high propensity to save may reduce aggregate demand, potentially hindering economic growth through what he termed the “paradox of thrift”.

Kimball (1990) and Afonso & Rodrigues (2024) underline the critical role of prudence in household decision-making under uncertainty, fostering precautionary savings. This concept, initially explored by Dreze & Modigliani (1975) and Leland (1978), has been further examined in recent studies, such as Baiardi *et al.* (2020), which underscore the complex interaction between individual saving behavior and macroeconomic stability, providing a thorough examination of recent developments in precautionary saving.

In light of the aforementioned findings and given the complexity inherent in individual decisions, caution should be exercised when applying some classic savings models, such as the one proposed by Friedman (1957) and others derived from it. Some of these models assume that individuals make savings decisions based primarily on their lifetime income to smooth consumption over time. The permanent income hypothesis posits that individuals save in anticipation of expected changes in income to maintain a stable standard of living.

However, this perspective may oversimplify the multifaceted nature of individual financial decision-making, as real-world behaviors are often influenced by different factors, including cognitive biases, risk preferences, and institutional and macroeconomic conditions. Fernandes *et al.* (2014) emphasize that saving decisions are not merely a matter of income allocation but involve deeper interactions between individual capabilities, behavioral constraints, and institutional frameworks.

In the same line, Thaler (1994) demonstrates that individuals often make suboptimal savings decisions due to biases and heuristics, such as the present bias, overvaluing immediate gratification rather than future consumption. The author further illustrates that these biases and the low level of Fin Lit contribute to making erroneous financial decisions, including insufficient savings and excessive current consumption. Corroborating these findings, Laibson (1997) elucidates how individuals' tendency to favor immediate gratification over future rewards can undermine the development of saving habits. The author highlights the need to educate and inform the population to foster financial planning and encourage the accumulation of reserves to manage potential economic shocks.

For Bernheim *et al.* (2001) and Lusardi & Mitchell (2014), financially literate individuals are more likely to save and make effective investment decisions. In this line, Lusardi *et al.* (2017) underline that enhancing financial knowledge can protect individuals from behavioral biases that often lead to suboptimal saving decisions. By improving understanding of risk and the importance of long-term financial planning, Fin Lit empowers individuals to resist the

temptation to reduce their savings, during periods of economic instability. Thus, countries with high levels of Fin Lit not only tend to save more but are also better positioned to take advantage of investment opportunities, thereby strengthening their economic growth potential.

In this vein, Atkinson & Messy (2012) argue that Fin Lit plays a crucial role in enabling individuals to overcome financial crises, reducing the likelihood of excessive debt accumulation and improving investment decisions. However, as access to new digital tools and financial systems becomes more complex, scams and emerging challenges intensify, exacerbating the risks of excessive indebtedness. Recent issues, such as the rise in popularity of sports betting, have introduced new financial threats by promoting poor financial behaviors, including higher rates of default, credit consumption, and financial instability (Winters & Derevensky, 2019).

Therefore, financially literate individuals are better equipped to plan for retirement and other financial goals. In this regard, using data from the National Financial Capability Study, Babiarz & Robb (2014) examine the relationship between financial knowledge and the probability of holding sufficient emergency savings. The findings indicate that higher levels of financial knowledge and confidence are associated with a greater likelihood of having adequate emergency funds. Furthermore, Fin Lit can act as a crucial tool to mitigate the impact of external elements that often discourage saving, particularly during periods of economic uncertainty and financial crises, when many individuals prioritize short-term consumption over long-term savings.

In this sense, Grimes *et al.* (2021) examine the role of economic literacy in mitigating household financial outcomes in the aftermath of the 2008 global financial crisis. The findings indicate that households headed by individuals with higher economic literacy levels are less likely to face negative financial impacts during economic crises. In this context, the authors reinforce the direct implications for policymakers focused on mitigating the effects of future financial crises. Therefore, investing in improving access and strengthening the delivery of economic and financial education can help reduce the adverse effects of economic shocks.

Similarly, Liu *et al.* (2024), using data from the China Household Finance Survey covering the Covid-19 period, show that financial literacy significantly enhances household financial resilience through wealth effects and risk mitigation, accelerating recovery from financial disturbances. In this context, the authors reinforce the direct implications for policymakers focused on mitigating the impacts of future financial crises. Therefore, investing in improving

access and strengthening the delivery of economic and financial education can help mitigate the adverse effects of economic shocks.

Regarding developing countries, Mottola (2013) suggests that Fin Lit is particularly significant, as many individuals are still developing their understanding of modern financial systems and remain more susceptible to poor financial decisions. In this context, financial education is a vital link between microeconomic behavior and macroeconomic performance. Therefore, the authors suggest that by ensuring that individuals are more financially literate and make informed decisions, policymakers stimulate individual financial well-being and foster economic stability and growth. Supporting these results, Adil *et al.* (2023) investigated the effects of Fin Lit on investor decisions in India. The findings highlight financial education as a key factor in making more informed and safe decisions, especially in times of crisis.

However, as crucial as education is, it is essential to develop reliable and accurate measures to assess Fin Lit. This will enable policymakers to monitor progress, identify gaps, and refine educational strategies. Concerning the development of a Fin Lit indicator, Lusardi and Mitchell (2008) were among the first to attempt to measure it. The authors argue that Fin Lit strongly predicts savings behavior, especially in developed economies where individuals face complex financial decisions, such as retirement planning and credit management. Recent papers, such as Hizgilov & Silber (2020), have refined this methodology, employing a fuzzy approach to measure Fin Lit.

Meanwhile, the OECD (Atkinson & Messy, 2012) provides a broader definition of Fin Lit, encompassing three key pillars: financial knowledge, financial behavior and financial attitudes. In this regard, the OECD (2016) defines Fin Lit as the capacity to apply knowledge and skills to manage financial resources effectively, empowering individuals to make informed financial decisions.

Corroborating those perspectives, the OECD (2020) reinforces the relevance of savings as a reflection of individual financial behaviors. These behaviors, shaped by Fin Lit, have emerged as critical factors in both the generation and allocation of savings, influencing personal financial stability and national economic outcomes.

However, the integration between the OECD pillars and contemporary financial practices, such as digital technologies, is still an area of development. Agu *et al.* (2024) suggest that technological developments have amplified the challenges of Fin Lit by introducing new forms of financial transactions, such as digital wallets and online banking systems. These

developments require a new set of skills to manage resources effectively, highlighting the need to update Fin Lit metrics to reflect emerging digital practices continually.

In this regard, Zhou *et al.* (2025) explore the impact of digital inclusive finance on rural entrepreneurial survival, emphasizing the moderating role of both digital and Fin Lit. The findings illustrate how Fin Lit, combined with digital skills, enhances the effective utilization of digital financial tools, fostering financial resilience and sustaining economic activities, particularly in rural and underserved areas.

In a similar vein, Zaimovic *et al.* (2023), through a systematic review, emphasize that Fin Lit, associated with factors such as education and age, plays a fundamental role in the financial well-being of individuals, directly impacting long-term planning and risk diversification. The study also underscores the increasing importance of integrating digital tools into financial research, as more people turn to them to manage their finances. Thus, the interaction between these socioeconomic factors and digital technologies enhances Fin Lit and influences the ability to achieve financial goals.

In this sense, this article aims to contribute by examining these relationships and exploring how the OECD pillars can be operationalized through contemporary indicators (Global Findex), focusing on the interaction between financial education and sociodemographic characteristics.

### **3. Data and Econometric Strategy**

#### **3.1. Data**

To examine these questions in further depth, this paper uses microdata from the 2021 Global Financial Inclusion Database (Global Findex), covering 136 economies (27,525 adults) with varying income levels, cultural contexts, and geographic regions. Made available by the OECD, this database provides a global perspective on the attributes influencing digital inclusion. However, the data also offer valuable insights into the determinants of saving behavior, including the analysis of relevant socioeconomic and behavioral factors. The selected socioeconomic variables are age, educational level, and income (categorized into quintiles).

Additionally, a binary variable (*agebin*) was derived from the age series, distinguishing individuals below and above the sample mean of 42 years. Although the sample includes individuals who save above 70, this transformation examines how individuals below this threshold save in different contexts, especially concerning retirement planning.

In addition to socioeconomic variables, the models incorporate indicators that measure the latent financial variable (Fin Lit), based on the OECD pillars. According to Hilgert & Hogarth (2003), personal experience represents a significant source of Fin Lit. The authors highlight that the frequent use of credit cards enables individuals to gain knowledge of key financial concepts such as credit limits, interest rates, and payment practices. Furthermore, penalties for excessive credit card use encourage learning about credit management and help prevent future financial issues. Therefore, the use of credit or debit cards contributes to the acquisition of financial knowledge and the conscious use of financial tools.

Concerning the financial behavior pillar, it is essential to capture financial attitudes, both in the short and long term. The OECD recommends including aspects such as regular budget preparation, concern for future planning and the establishment of financial targets. Therefore, indicators such as the use of smartphones or the internet to check account balances, alongside concerns regarding financial security in old age, reflect tendencies and practices that have a direct impact on financial decision-making.

Taking the preceding analysis into account, the following indicators were employed to construct the pillars of Fin Lit. i) Used a mobile phone or internet to access account (Check acc), ii) Used a credit card (Used CC), iii) Paid credit card balances in full (Paid CC Full), iv) Difficulty of emergency funds in 30 days (Diff Emerg 30d), and v) Financially worried: old age (Fin Worried Old Age). These indicators reflect key attributes for assessing financial management capabilities, use of financial tools and long-term planning.

To capture the three dimensions of savings, the following variables were used: i) saved in the past year, ii) saved for old age, and iii) saved using a financial institution account. These variables encompass general savings practices, long-term financial planning, and the use of financial products, respectively.

The integration of socioeconomic, behavioral, and Fin Lit variables, aligned with the OECD pillars, enables a comprehensive analysis of the determinants influencing individual saving decisions. This approach enhances the understanding of global financial dynamics and provides useful insights for developing public policies and interventions to improve financial well-being.

Table 1 offers an initial overview of the main variables. The variable Agebin, which represents individuals younger than 42 years, shows that 55% of the participants fall below the sample's average age. By transforming age into a binary variable, comparisons can be made between

individuals at the beginning and end of the retirement accumulation period<sup>‡</sup>. The standard deviation (SD) reveals considerable diversity of economic and social contexts across economies. This underscores the importance of accounting for such specificities in model design.

**Table 1 – Descriptive Statistics**

	% Total							Mean		
	Age <= 42	Check ACC	Used CC	Paid CC (Full)	Saved Old Age	Saved Fin Inst	Saved	Age	Education Level	Income Quintile
<b>Mean</b>	55%	75%	76%	70%	52%	76%	46%	41.8	2.3	3.8
<b>SD</b>	22%	16%	14%	17%	21%	16%	19%	7.7	0.3	0.4
<b>Max</b>	100%	100%	100%	100%	100%	100%	100%	60.9	3	5
<b>Min</b>	12%	33%	24%	25%	0%	26%	0%	25.3	1.3	3

Source: authors’ calculations.

In the socioeconomic context, the mean education level is 2.3 years (ranging from 1 to 3) with a low SD, indicating limited variation. Conversely, income level (income quintile) is a key determinant of consumption and savings. In this study, the income level has a mean of 3.8 (ranging from 1 to 5) with moderate dispersion, reflecting the heterogeneity in participants' income.

In addition to the socioeconomic variables, the article explores key drivers influencing Fin Lit. Despite moderate dispersion around a mean of 75%, Check Acc reflects regular account monitoring, demonstrating habits of financial control and supervision. In contrast, Paid CC (Full), with a mean of 70% and considerable SD, indicates diverse levels of control and payment behaviors within the sample. Lastly, the credit card variable (Used CC) presents a mean of 76% with a lower SD, highlighting a consistent practice within the sample.

Regarding the propensity to save, the Saved variable represents this behavior, regardless of how individuals engage in saving practices. The average result (46%) indicates that slightly less than half of the participants across the countries included in the study set aside a portion of their resources. Similarly, the Saved Old Age exhibits an average of 52%, reflecting the proportion of individuals saving specifically for retirement. This measure suggests that different socioeconomic conditions among participants may be responsible for the wide variation observed in the models. Moreover, values as low as zero indicate that some individuals lack a long-term savings strategy. Lastly, to examine the use of financial institutions as a means of

<sup>‡</sup> The OECD states that the expected retirement age is approximately 64 years.

saving, the Saved Fin Inst shows a high average of 76%. However, significant dispersion points out that the use of interest-bearing accounts remains low among certain groups of countries.

In addition, Table 2 presents the correlation matrix, which identifies associations between socioeconomic and behavioral variables, as well as between savings and income. An inspection of Table 2 reveals a positive association between Check Acc and Education Level (0.48), whereby higher educational levels are linked to more frequent monitoring of current accounts. This result highlights the significant role of education in fostering organized financial practices.

**Table 2 – Correlation Matrix**

	<b>Check ACC</b>	<b>Used CC</b>	<b>Paid CC (Full)</b>	<b>Saved Old Age</b>	<b>Saved Fin Inst</b>	<b>Saved</b>	<b>Age</b>	<b>Education Level</b>	<b>Income Quintile</b>
<b>Check ACC</b>	1.00								
<b>Used CC</b>	0.35	1.00							
<b>Paid CC (Full)</b>	0.40	0.39	1.00						
<b>Saved Old Age</b>	0.33	0.23	0.37	1.00					
<b>Saved Fin Inst</b>	0.16	0.00	0.13	0.80	1.00				
<b>Saved</b>	0.38	0.23	0.48	0.82	0.68	1.00			
<b>Age</b>	0.32	0.38	0.68	0.27	-0.02	0.43	1.00		
<b>Education Level</b>	0.48	0.28	0.41	0.17	-0.17	0.22	0.43	1.00	
<b>Income Quintile</b>	0.00	-0.12	-0.27	0.02	0.04	-0.02	-0.27	-0.01	1.00

Source: authors’ calculations.

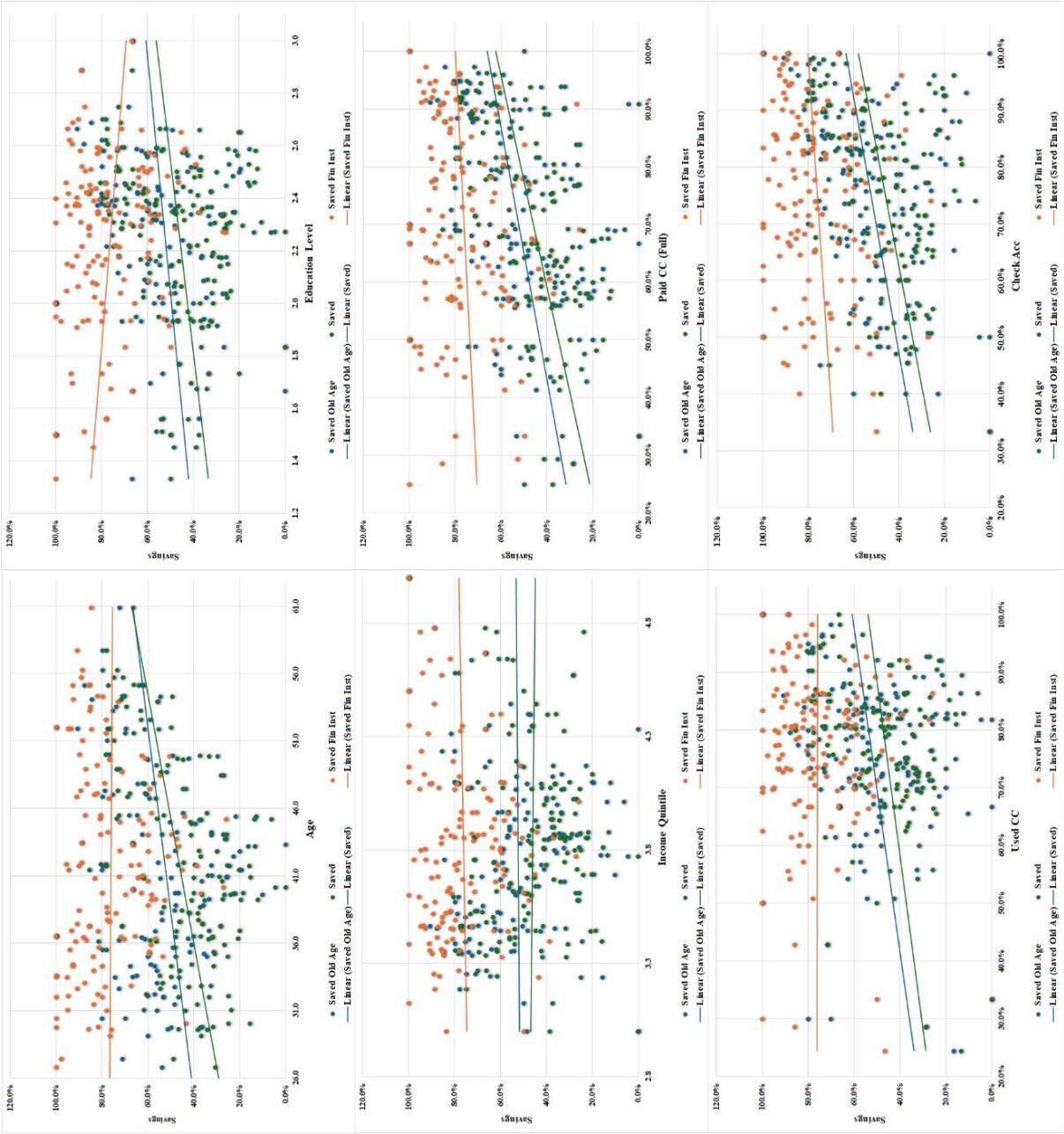
Additionally, the positive relationship between Education Level and Paid CC Full (0.41) further implies that individuals with higher levels of education are more likely to manage debt. On the other hand, the income level variable exhibits weak or negative correlations with most behavioral variables, such as Used CC (-0.12) and Paid CC Full (-0.27). Thus, income alone may not be a determining factor in savings decisions, further highlighting the complexity of interactions between income, financial behavior and other socioeconomic determinants.

Lastly, broad savings (Saved) exhibit moderate positive correlations with Paid CC Full (0.48) and Age (0.43), indicating that disciplined financial practices, such as full credit card repayment, as well as age, are positively associated with saving behavior. These results suggest that factors, such as financial planning and population maturity, may play a significant role in shaping saving decisions.

To deepen and complement the preliminary examination, scatterplots help identify potential idiosyncrasies, contributing to the development of robust models and insights that improve the interpretation and generalization of average results. Figure 2 illustrates the joint behavior of the

savings dimensions (Saved, Saved in Old Age and Saved Fin Institutions), socioeconomic variables (Age, Education Level and Income Quintile) and the variables related to Fin Lit (Paid CC, Used CC and Check CC).

**Figure 2 – Savings Dimensions (Sample Mean)**



Source: authors’ calculations.

The charts point out that countries with higher levels of education show a stronger propensity to save, particularly in the context of the Saved and Saved Old Age variables. However, although this relationship is evident from the average data, further investigation into causal links is required, as explored by the models in the following section.

Figure 2 further extends this analysis by exploring the joint relationship between individual savings and income levels. One might expect that individuals in higher income quintiles would have a stronger propensity to save, due to their greater financial capacity for accumulation. However, the aggregate data indicate that the relationship is not straightforward, suggesting that other individual aspects may have been neglected in this initial analysis.

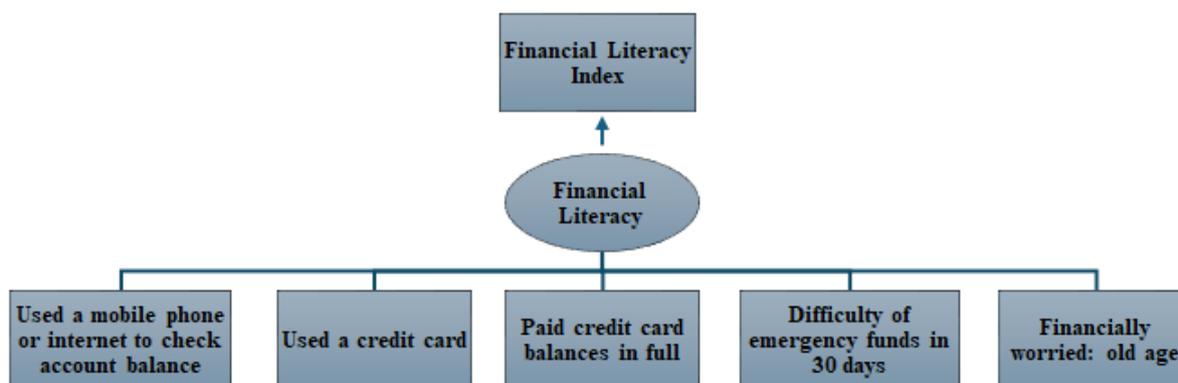
Regarding the age variable, a positive trend is observed despite relatively high dispersion, reflecting the diverse financial and socioeconomic experiences across the country. In terms of Fin Lit, the scatter plot reveals that individuals from countries where credit card balances are paid in full show a greater propensity to save. However, substantial dispersion suggests a significant variation across individuals, potentially linked to different levels of financial control and perceptions of debt risk. Lastly, the variables Used CC and Check cc are identified as important drivers, contributing to the individual savings decision.

### **3.2. Econometric Strategy**

Lusardi and Mitchell (2008) and OECD (2020) underline the significance of measuring Fin Lit as a multidimensional construct. Considering this methodology, the Fin Lit construct required the selection of variables consistent with the three pillars outlined by the OECD: financial knowledge, behavior, and attitudes. Thus, the model was developed on this theoretical and empirical basis, guiding the selection of indicators. Additionally, Atkinson and Messy (2012) reinforce the need to base the Fin Lit construct on practical indicators that reflect everyday behaviors.

Thus, the strategic framework (Figure 3) is defined based on five observed indicators from the Global Findex Survey (2021): i) Used a mobile phone or internet to access account (Check acc), ii) Used a credit card (Used CC), iii) Paid credit card balances in full (Paid CC Full), iv) Difficulty of emergency funds in 30 days (Diff Emerg 30d), and v) Financially worried: old age (Fin Worried Old Age).

**Figure 3 – Financial Literacy – Strategic Framework**

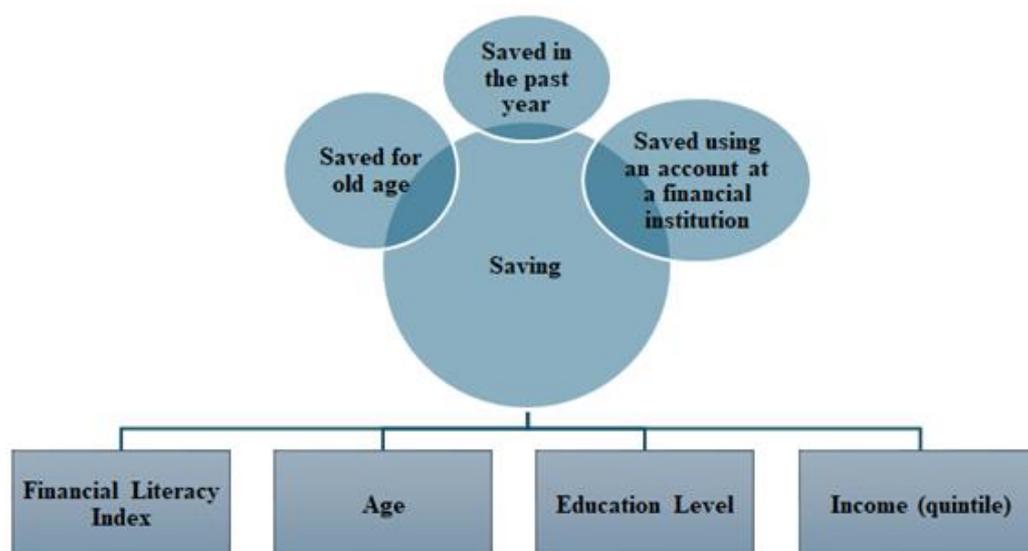


Source: authors' calculations.

This construct is subsequently transformed into the index used in econometric models. The index, acting as a proxy for the latent variable (Fin Lit), reflects the integration of observed variables, weighted according to their relative contributions to the theoretical construct, and offers important methodological advantages. Firstly, it facilitates the integration of Fin Lit as a multidimensional construct into simpler and more interpretable econometric analyses. Furthermore, the continuous proxy provides enhanced analytical flexibility compared to models that directly address the latent variable within GSEM frameworks, allowing for the inclusion of regressions that account for varying specifications or interactions between variables.

After estimating the Fin Lit index, the subsequent step involves developing models to measure the impact of financial education alongside socioeconomic variables. Savings require an approach that captures the different dimensions of this variable, offering a more comprehensive understanding of the attributes that influence it. To this end, three distinct proxies represent the dimensions of savings (Figure 4).

**Figure 4 – Dimensions of Savings – Strategic Framework**



Source: authors' calculations.

The first savings proxy examines whether the individual saved in the past year, acting as a general indicator of their capacity or willingness to set aside financial resources over a recent time horizon. The second dimension investigates whether savings are intended for the long term, focusing on retirement planning and reflecting the ability to anticipate financial needs. Lastly, the third proxy, represented by savings through financial institutions, examines formal savings instruments such as bank accounts and financial investments.

The different perspectives are examined using logit models (logistic regression), which estimate the influence of the Fin Lit index and other explanatory variables on the probability of saving. The logit model is appropriate because it involves categorical or binary dependent variables, such as saving or not saving through financial institutions. Moreover, this approach captures non-linear relationships between explanatory variables and the binary dependent variable, enabling the results to be interpreted as changes in the likelihood of an event occurring, which is particularly relevant in the context of savings decisions.

In addition to the three dimensions of savings, all models are estimated for different subsamples, namely: the full sample (136 countries), high and low-income economies, and countries in Europe and Latin America. This procedure supports the evaluation of the effects on savings decisions, considering different economic and regional contexts.

Therefore, the baseline specification used in the paper is as follows:

$$P(\text{Saved}^j) = (\delta_0 + \delta_1 \text{FinLit}_i + \delta_2 \text{Age}_i + \delta_3 \text{Income}_i + \delta_4 \text{Education}_i) \quad (1)$$

Where  $P(\text{Saved}^j)$  is the probability of the saving behavior  $j$ ,  $\delta_0$  is a constant term.  $\text{FinLit}_i$ : is the Financial literacy level of individual  $i$ ,  $\text{Age}_i$  is the Age of individual  $i$ ,  $\text{Income}_i$  is Individual income, and  $\text{Education}_i$  is the Educational attainment of individual  $i$ .

### **3.3. Structural Equation Modelling (SEM) and Generalized Structural Equation Modelling (GSEM)**

Due to the nature of the phenomenon investigated and the use of microdata, with continuous and categorical indicators, the SEM approach was adopted owing to its advantages over conventional statistical methods, such as multiple regression. Although they explore direct relationships between observable variables, they face significant limitations when dealing with abstract constructs and more complex causal relationships (Kline, 2023). SEM stands out in the simultaneous modelling of associations between observed and latent variables, integrating these relationships into a single analytical framework. This feature is especially valuable in contexts where latent variables capture complex concepts such as attitudes, cognitive skills, and other unobservable attributes inferred from empirical indicators in research areas such as psychology, economics, and marketing (Hair *et al.*, 2010; Schumacker & Lomax, 2015).

Another key advantage of SEM is the explicit incorporation of measurement errors. In contrast to traditional approaches that treat observed variables as perfect measures, SEM recognizes and accommodates potential inaccuracies in the data, enhancing the validity and precision of estimates (Bollen, 1989). This capability is important in settings where indicators only partially reflect theoretical constructs, ensuring greater reliability. Moreover, SEM provides structural flexibility to incorporate mediators and moderators, supporting the analysis of complex interactions. Lastly, this approach avoids the need for multiple separate models, a limitation of conventional techniques, and offers an integrated and detailed view of relationships between variables (Kline, 2023).

In addition to SEM, we take a step further and employ GSEM. This methodological extension provides flexibility in models with non-continuous dependent variables, such as binary, ordinal, or count variables, which is essential for the data analysis conducted in this study. GSEM stands out for dealing with non-normal distributions, ensuring that estimates accurately reflect the true characteristics of the data, without the need for artificial transformations that could compromise

the validity of inferences. Additionally, GSEM enables the integration of variables with different distributions within a single model, capturing the complexity of interactions between constructs (Cain, 2021; Hesketh & Skrondal, 2021). For this purpose, Stata 15 was used, which is suitable for handling complex and large-scale data processing.

Hence, by employing GSEM alongside logit models and using Global Findex data, this paper addresses the limitations of traditional methods, providing a more refined analysis of the relationships between Fin Lit and socioeconomic variables in the context of digital technologies. Moreover, the exploration of distinct savings dimensions, coupled with sample segmentation, offers a broader perspective on the factors influencing savings behavior on a global scale.

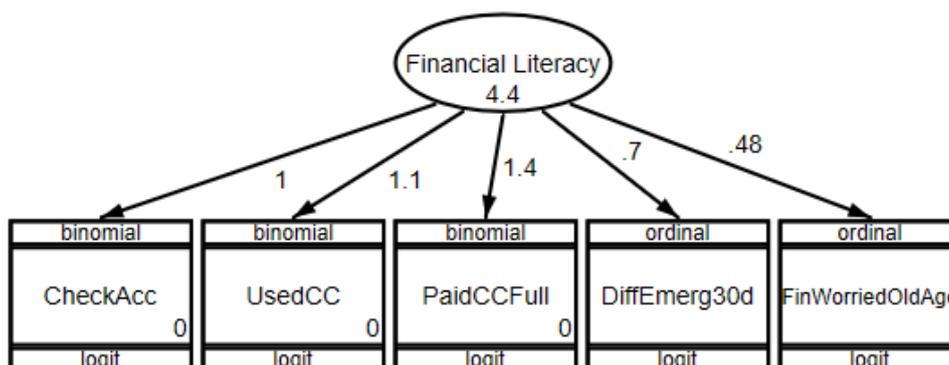
While GSEM offers substantial advantages in modelling complex relationships involving latent constructs and non-continuous variables, its use in this study is not without limitations. The method requires large sample sizes and considerable computational power, which may restrict its use in smaller-scale or lower-resource settings. The reliance on cross-sectional data from the Global Findex (2021) also limits the capacity to infer causal relationships, as GSEM, despite its structural strength, cannot fully address the temporal dynamics of financial behavior. Finally, cultural diversity across countries may lead to heterogeneous interpretations of the financial literacy indicators, thereby affecting the comparability of the results.

## **4. Results and Analysis**

### **4.1. Financial Literature Model**

To estimate the Fin Lit index, variables encompassing practical aspects, such as new technologies and personal finance characteristics, were selected based on the OECD pillars. As previously highlighted, the indicators include the use of smartphones or the internet to monitor account balances, the ability to mobilize emergency funds, and financial planning for old age. Figure 5 and Table A1 (Appendix) depict the estimation of the Fin Lit index. Using the GSEM approach, the first three variables were modelled as binary, while the last two were treated as ordinal variables, representing different levels of effort required to establish emergency funds and varying degrees of financial concern regarding long-term planning (old age).

**Figure 5 – Financial Literacy (Structural Model)**



Source: authors’.

Among the explanatory variables, CheckAcc, which evaluates the use of mobile devices or the internet to check account balances, was designated as the reference variable in the model and fixed at a coefficient of 1. In this context, the highest contribution was observed in PaidCC (Full), representing the habit of paying off credit card balances in full by their due date, with a coefficient of 1.4. This result highlights that responsible credit usage is strongly associated with higher levels of Fin Lit. The second largest contribution is attributed to Used CC, reflecting the use of credit or debit cards, with a coefficient of 1.1. This finding reinforces the importance of access to and frequent use of financial tools to develop financial competencies.

Diff Emerge 30d, which measures the ability to raise emergency funds within 30 days, presents a coefficient of 0.70, indicating that the capacity to respond to financial shocks is a crucial component of Fin Lit. On the other hand, Fin Worried Old Age, which captures financial concerns related to old age, has a smaller coefficient (0.48), but remains significant, suggesting that perceptions of long-term financial security contribute to the index.

The findings indicate that consistent financial behaviors, along with proactive attitudes, are significant determinants in the formation of Fin Lit. These findings provide a solid foundation for subsequent analyses, where the Fin Lit index will be used to investigate the influence of Fin Lit on specific financial decisions, such as saving propensity.

Figure 6 depicts the estimated global Fin Lit index score, which ranges from 1.7 to 5.2. Despite a high mean (3.9), the sample may conceal substantial disparities across regions (SD of 0.62). When comparing the rankings of this index with the findings of the S&P Global Financial Literacy Survey (2014), it becomes apparent that, despite differences in methodologies and

periods, the results of the Fin Lit index in this study align with those of the S&P survey. The 2014 S&P survey encompassed 150,000 adults across more than 140 economies, identifying the top ten countries with the highest Fin Lit scores: Australia, Canada, Denmark, Finland, Germany, Israel, the Netherlands, Norway, Sweden, and the United Kingdom.

**Figure 6 - Financial Literacy - Index**



Source: authors' calculations.

Regardless of methodological differences, the Fin Lit index presented here exhibits considerable alignment with S&P research findings. Notably, six of the ten countries identified by S&P as having the highest Fin Lit scores: Norway, Sweden, Denmark, the Netherlands, Australia, and Finland, also rank within the top 10 of the Fin Lit index estimated in this study. Extending the analysis to include the top 15 countries, Canada is likewise represented within this group.

**4.2. Savings Behavior Modelling**

This subsection examines the propensity to save, considering different dimensions of savings and distinct sample groups. The analysis adopts three perspectives on savings, each addressed through a specific model. The first model examines general savings behavior, the second focuses on retirement savings, and the third investigates savings conducted through financial institutions. These approaches provide a comprehensive framework for understanding how demographic features and Fin Lit influence savings decisions across diverse contexts. The baseline specification is as follows:

## Full Sample

The initial findings (Table 3) indicate that for the full sample (136 countries), the variable age negatively affects (-0.0080632) the decision to save. This implies that each additional year reduces the likelihood of saving by approximately 0.80% (odds ratio:  $e^{-0.008632} \approx 0.991969$ ). Conversely, in Models 2 (retirement savings) and 3 (savings through financial institutions), the coefficients are positive (0.010 and 0.0006, respectively). These results suggest that with increasing age, individuals are more likely to save for retirement (1.2% increase) and marginally more inclined to save through financial institutions (0.62% increase). The latter, however, is not statistically significant ( $e^{0.0006203} \approx 1.00062$ ).

These findings illustrate the evolving financial priorities across different stages of life. Younger individuals demonstrate a greater tendency towards general savings, whereas this propensity declines for retirement-specific savings. This behavior may be influenced by immediacy bias (Shefrin & Thaler, 1992), which fosters a preference for short-term objectives. Additionally, lower utilization of formal financial instruments among younger individuals may reflect limited Fin Lit and experience (Lusardi & Mitchell, 2014).

**Table 3 – Structural Models (Full Sample)**

Dependent Variable	Savings (Full Sample)		
	Model 1 Saved	Model 2 Saved For Old Age	Model 3 Saved in Fin. Institution
Age	-0.0080632*** (0.0009101)	0.0101084*** (0.000783)1	0.0006203 (0.0007946)
Education Level	0.1228438*** (0.0256256)	0.2007449*** (0.0221637)	0.2630273*** (0.0225169)
Income (Quintile)	0.1306782*** (0.0112218)	0.0975373*** (0.0975373)	0.0815203*** (0.0098845)
Financial Literacy	0.5431148*** (0.0135792)	0.5002629*** (0.0122235)	0.5578379*** (0.0124498)
Constant	-1.391927*** (0.0847529)	-3.272087*** (0.0798568)	-2.927667*** (0.079655)
Pseudo R <sup>2</sup>	0.0774	0.0740	0.0822
Prob>chi <sup>2</sup>	0.00000	0.00000	0.00000
AIC	27242.36	35093.89	37037.46
BIC	27283.47	35135	37045.69
Countries		136	
Observations		27,525	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

The second socioeconomic variable, educational level, demonstrated a positive and statistically significant influence on saving, further emphasizing the importance of educational attainment in shaping financial behaviors. An increase in educational level was associated with improvements of 13.35% (Model 1), 22.16% (Model 2), and 30.27% (Model 3) in the likelihood of saving. Moreover, the income level variable, measured by quintiles, also highlighted significant and positive effects. In Model 1, each increase in an income quintile raised the probability of saving by 13.88%. In Model 2, higher income enhanced the likelihood by 10.31%, whereas in Model 3, the increase was more modest at 8.48%.

Finally, Fin Lit had the most pronounced repercussion. In Model 1, an increase in Fin Lit boosted the likelihood of saving by 71.61%. For retirement savings (Model 2), the increase was 65.13%, while for savings through financial institutions (Model 3), it was 74.39%.

The results reveal a nuanced framework, highlighting the pivotal roles of financial knowledge/skills and income in shaping savings behavior. Income, in particular, exhibited more pronounced effects than those observed in the descriptive statistics section based on aggregated country-level means. This discrepancy can be attributed to the heterogeneity within the analyzed groups, which may obscure true associations. Aggregate measures often fail to capture individual variations, such as differences in economic conditions, financial beliefs, and specific behaviors. Furthermore, savings decisions are influenced by attributes, including life stage, preferences, and financial goals, which may not be adequately represented by aggregated data.

Moreover, the immediacy bias may be particularly present among younger individuals or those with lower levels of education. Consequently, in aggregated data, the prevalence of this bias could attenuate the effects of income, age, and educational level on the propensity to save. Given the heterogeneity across countries, new samples were selected, providing more precise insights into saving behavior.

### **Income Level of Countries**

For high-income economies (46 countries), the age variable was significant in Model 4, indicating a negative association between age and the likelihood of saving, with a decrease of 1.14%. However, in Model 5 (retirement savings), the same variable exhibited a positive and significant effect, increasing the likelihood of long-term saving by 0.43%. In Model 6 (savings through financial institutions), the relationship was negative, showing a reduced likelihood of saving by 0.4% (Table 4).

**Table 4 - Structural Models (High Income)**

Dependent Variable	Savings (High Income)		
	Model 4 Saved	Model 5 Saved For Old Age	Model 6 Saved in Fin. Institution
Age	-0.0114706*** (0.0011972)	0.004188*** (0.0009405)	-0.0044384*** (0.0009737)
Education Level	0.3223447*** (0.0340159)	0.2947778*** (0.0270554)	0.3846887*** (0.0279803)
Income (Quintile)	0.1768872*** (0.0147332)	0.1467067*** (0.0116298)	0.1245879*** (0.0120524)
Financial Literacy	0.3976867*** (0.0186706)	0.3419456*** (0.0157845)	0.4008181*** (0.0161451)
Constant	-0.8969753*** (0.1257604)	-2.39163*** (0.1053575)	-2.128372*** (0.107472)
Pseudo R <sup>2</sup>	0.0570	0.0403	0.0502
Prob>chi <sup>2</sup>	0.0000	0.0000	0.0000
AIC	16560.95	24193.28	22833.17
BIC	16600.25	24232.59	22872.48
Countries		46	
Observations		19,173	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

Regarding the role of educational level, the impact was notable across all forms of saving. In Model 4, education increased the likelihood of saving by 41%, in Model 5 by 35%, and in Model 6 the effect was even more pronounced, with a 48.5% increase in the likelihood of saving through financial institutions. As observed in models using the full sample, individual income also fosters saving behavior, with increases of 18.44% (Model 4), 15.5% (Model 5), and 12.7% (Model 6). Lastly, Fin Lit consistently exerted a strong influence on all forms of saving, boosting the likelihood of saving by 48.6%, 41%, and 49% in Models 4, 5, and 6, respectively.

For low-income economies (90 countries), the age variable remained significant in Models 7 and 9, indicating that older individuals have lower chances of saving, with coefficients of -2.35% and -1.05%, respectively. Regarding long-term saving (Model 8), the coefficient was not statistically different from zero. Individual income had a strong impact across all models, ranging from 29.6% to 31.4%. However, educational attainment did not appear to be a significant driver of saving behavior, showing negative or non-significant coefficients. Finally, Fin Lit continued to play a key role, with increases of 50.5% (Model 7), 53.5% (Model 8), and 56.5% (Model 9) across different saving perspectives (Table 5).

**Table 5 - Structural Models (Low Income)**

Dependent Variable	Savings (Low Income)		
	Model 7	Model 8	Model 9
	Saved	Saved For Old Age	Saved in Fin. Institution
Age	-0.0237627*** (0.0017244)	0.0028201 (0.0017117)	-0.0106018*** (0.0016963)
Education Level	-0.1450705*** (0.0406565)	-0.016384 (0.040818)	0.0421811 (0.039909)
Income (Quintile)	0.2762646*** (0.0194583)	0.2623572*** (0.0211383)	0.2602152*** (0.0201803)
Financial Literacy	0.404618*** (0.0237116)	0.4293733*** (0.024905)	0.4451046*** (0.0241938)
Constant	-0.4930404*** (0.1240795)	-3.184245*** (0.1386778)	-2.551209*** (0.1315913)
Pseudo R <sup>2</sup>	0.0770	0.0635	0.0726
Prob>chi <sup>2</sup>	0.00000	0.00000	0.00000
AIC	10068.85	10207.55	10538.31
BIC	10104	10242.7	10573.46
Countries		90	
Observations		8,352	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

So far, the results suggest that Fin Lit plays a critical role in encouraging savings, particularly concerning long-term planning, where significant resistance persists even among younger and more affluent populations. The comparatively weaker influence of Fin Lit on saving behavior in high-income countries is not particularly surprising, as these populations tend to have higher levels of education and greater access to financial instruments. Additionally, higher income tends to diminish the relevance of Fin Lit.

In this context, it might be expected that low-income countries would exhibit a more pronounced impact of Fin Lit on different saving perspectives. However, an intriguing finding is that the coefficients associated with Fin Lit in low-income countries do not surpass those observed in the full sample. While the coefficients reflect a stronger influence, they do not stand out significantly compared to wealthier countries.

### Geographical Influence

To further explore whether geographical factors influence the propensity to save and provide a more refined analysis, additional models were employed to assess the significance of regional

variations alongside levels of development. Two distinct regional samples were analyzed: Latin America and Europe. Latin America, characterized by unique socioeconomic conditions, may present a pronounced impact of Fin Lit on saving decisions. Conversely, the inclusion of European countries, which benefit from advanced economic structures and higher levels of education, sought to determine whether the impact of Fin Lit is indeed more subdued in these contexts. These regional analyses offer valuable insights into the determinants of saving behavior across diverse settings.

An inspection of the models (Table 6) reveals that for Latin American economies, an increase in age leads to a lower probability (-2.22%) of saving. Similar to the previous model, age does not exert a statistically significant influence on long-term savings (retirement planning). Furthermore, older individuals are less inclined to save through financial institutions, with a decrease of 0.8% in likelihood. In contrast, educational level demonstrates a positive and significant impact, underscoring its essential role in influencing the propensity to save. Higher levels of education increase the probability of saving by 36.4% for broad savings, 30% for retirement savings, and an impressive 60% for savings through financial institutions.

**Table 6 - Structural Models (Latin America)**

Dependent Variable	Savings (Latin America)		
	Model 10 Saved	Model 11 Saved For Old Age	Model 12 Saved in Fin. Institution
<b>Age</b>	-0.0224556*** (0.0023155)	0.0026863 (0.0021421)	-0.0077655*** (0.0021856)
<b>Education Level</b>	0.3066157*** (0.0629313)	0.2697022*** (0.0609777)	0.4712092*** (0.0621063)
<b>Income (Quintile)</b>	0.0560286* (0.0301485)	0.0283116 (0.0291867)	0.0263978 (0.0294212)
<b>Financial Literacy</b>	0.854501*** (0.048066)	0.873121*** (0.0471829)	0.9812053*** (0.0485521)
<b>Constant</b>	-1.329609*** (0.1938474)	-3.529703*** (0.2033453)	-3.600394*** (0.205288)
<b>Pseudo R<sup>2</sup></b>	0.1147	0.1033	0.1326
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	4180.570	4581.435	4494.039
<b>BIC</b>	4211.702	4612.567	4525.170
<b>Countries</b>		20	
<b>Observations</b>		3,738	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

If the consequence of an increase in personal income is relatively moderate (6%) only on broad savings, Fin Lit emerges with the most substantial coefficient (0.98), indicating that an increase in this variable more than doubles the likelihood (166%) of saving (Model 12). In this regard, Van Rooij *et al.* (2012) noted such elevated parameters when examining the impact of Fin Lit on savings, particularly in countries with low levels of financial knowledge and skills.

The subsequent models (Table 7) explore the sample of European countries to complement the regional comparisons. In the case of broad savings (Model 13), the age variable reveals a negative impact (-2.1%), indicating that as individuals age, their propensity to save diminishes compared to younger adults. Similar findings are observed in Models 14 and 15 (-0.3% and -1.2%, respectively). Besides, the variables of education level and income point to a significant contribution to saving decisions, with each increase in education raising the probability of saving by 31%, 33%, and 42% across the models. Meanwhile, as individuals progress through income quintiles, the probability of saving rises by 17% (Model 13). Finally, Fin Lit continues to play a crucial role, contributing to increases of 34%, 27%, and 34.5% in the likelihood of saving in Models 13, 14, and 15, respectively.

**Table 7 - Structural Models (Europe)**

Dependent Variable	Savings (Europe)		
	Model 13 Saved	Model 14 Saved For Old Age	Model 15 Saved in Fin. Institution
<b>Age</b>	-0.021237*** (0.0022018)	-0.0033349** (0.0015176)	-0.0122371*** (0.0016123)
<b>Education Level</b>	0.2658507*** (0.0564635)	0.2836083*** (0.0405099)	0.3537369*** (0.0425337)
<b>Income (Quintile)</b>	0.1604027*** (0.0256746)	0.1387927*** (0.0181074)	0.1099388*** (0.019131)
<b>Financial Literacy</b>	0.2960789*** (0.0298446)	0.2391232*** (0.0227517)	0.2972493*** (0.0235376)
<b>Constant</b>	0.4595337* (0.2290296)	-1.497193*** (0.1683022)	-1.124506*** (0.1748772)
<b>Pseudo R<sup>2</sup></b>	0.04612	0.02733	0.03936
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	5802.669	9980.194	9187.714
<b>BIC</b>	5837.645	10015.170	9222.69
<b>Countries</b>		40	
<b>Observations</b>		8,064	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

### **4.3. Robustness**

In order to corroborate the results presented, new models were developed (Tables A4 to A8 – Appendix), maintaining consistency in the variables analyzed, to ensure the reliability of the conclusions obtained. In this sense, a new variable, *agebin* (a binary variable), was introduced in place of the continuous age variable to capture potential differences between two distinct age groups. This adjustment allows us to examine the impact of belonging to the group below the sample average.

While both variables (*age* e *agebin*) reveal that younger individuals tend to save more than older ones, the binary age categorization (below 42 years) offers a more nuanced understanding of the relationship between age and savings, enhancing the granularity of comparisons. The comparison between the previous models and those in the appendix demonstrates that the *age* and *agebin* variables exert significant and complementary impacts on saving decisions. The *age* variable generally produces negative coefficients, whereas *agebin* (for individuals below 42 years) shows positive effects. These inverse coefficients reflect the same underlying trend in terms of direction. Consequently, the results of the *age* and *agebin* variables do not contradict each other but rather complement one another, highlighting distinct savings behaviors across the life course.

For models with a continuous age variable, younger adults tend to save less in specific contexts, such as for retirement or through financial institutions. This trend can be attributed to older individuals who have accumulated substantial wealth, reducing their propensity to save to the same extent, particularly as they approach retirement or are already retired when financial needs tend to differ. In the same vein, models that employ the *agebin* variable indicate that individuals under 42 years old are more likely to save. A relevant finding is the difficulty younger individuals face in committing to long-term savings, which may be attributed to behavioral biases such as present bias. Consequently, although younger individuals show a higher likelihood of saving, their saving behaviors tend to be more oriented towards short-term goals, such as emergencies or immediate expenses, rather than long-term commitments like retirement.

In addition, the greater impact of the *agebin* variable in low-income regions and Latin America may reflect cultural and economic differences, where a focus on short-term savings is more prevalent owing to economic turmoil and the prioritization of immediate needs. Thus, while younger individuals show a higher tendency to save, their commitment to long-term savings

may be limited by concerns over financial insecurity or the need to address more immediate priorities.

Regarding the other coefficients from the new models, they remain largely unchanged after replacing the age variable with agebin, which is critical for ensuring model robustness. The stability of these parameters indicates that other socioeconomic variables and Fin Lit continue to exert consistent influences on savings, regardless of how the age variable is operationalized. This consistency is important, as it ensures that the findings are not overly reliant on specific methodological choices but rather reflect underlying and robust relationships between the variables analyzed. As a result, the persistence of coefficients reinforces the validity of the findings and contributes to the generalizability of the conclusions.

## **5. Conclusion**

This article investigates three dimensions of individual savings decisions: broad savings, long-term savings (retirement), and savings through financial institutions. The analysis is based on data from the Global Findex (2021), incorporating demographic variables alongside those aligned with the OECD's pillars of financial knowledge, financial behavior, and financial attitudes. Moreover, variables related to technological tools such as smartphones for debt management, credit card utilization, and the ability to access emergency funds, offer valuable insights into the determinants of savings in contemporary economic contexts. Each perspective contributes to a more comprehensive understanding of the factors influencing saving decisions, highlighting the interaction between socioeconomic and behavioral variables across different population groups.

The findings highlight that Fin Lit is a decisive factor in fostering conscious and structured savings practices, particularly in low-income countries, where it significantly mitigates economic vulnerabilities and enhances access to financial instruments. Conversely, in high-income economies, while the effects of Fin Lit remain positive, they tend to be less pronounced, potentially owing to greater familiarity with financial instruments and higher levels of economic resilience. In addition, educational level and personal income emerge as significant components of saving decisions. The impact of age, however, varies according to the specific savings objective, reflecting the nuanced interplay between demographic factors and financial decision-making.

In this context, the GSEM approach enhanced the analysis by capturing the complex interactions between observed and latent variables. This methodology offered a deeper and more robust insight into the determinants of savings behavior.

The implications of these findings are twofold. Firstly, they suggest that efforts to enhance Fin Lit and confidence in financial decision-making are essential for improving households' financial resilience. By advancing financial education and implementing targeted measures to improve financial knowledge, policymakers and institutions can better equip households to navigate economic uncertainties, thereby reducing dependency on external support during periods of financial distress.

Secondly, these results highlight the significance of targeted Fin Lit programs, particularly for populations with lower levels of financial knowledge, in fostering long-term economic stability and growth. Such initiatives have the potential to reduce disparities in access to financial resources and, simultaneously, enhance overall household well-being. To maximize their effectiveness, these programs should prioritize specific demographic groups, including young adults and low-income individuals, who often encounter distinct challenges concerning savings and financial planning.

Additionally, as noted by Fernandes *et al.* (2014), the integration of digital and technological tools as enablers of access to and utilization of financial products is crucial in amplifying the impact of interventions. These tools not only expand accessibility to financial products but also improve the delivery of educational content and enable ongoing evaluation, ensuring that intervention policies are tailored to the specific needs of the target population. However, the effectiveness of such initiatives relies on incorporating insights from behavioral economics to address cognitive biases and foster improved decision-making.

Despite these contributions, this paper acknowledges certain limitations, offering opportunities for further exploration. Future research could examine the impact of specific financial education interventions on vulnerable populations, such as young adults entering the workforce or individuals engaged in informal employment. Furthermore, longitudinal data could enhance the understanding of temporal dynamics in financial behavior. Lastly, future research might examine how cultural and institutional factors moderate the relationship between Fin Lit and savings across different regions.

## References

- Adil, M., Singh, Y., Subhan, M., Saleh Al-Faryan, M. A., & Ansari, M. S. (2023). Do trust in financial institution and financial literacy enhances intention to participate in stock market among Indian investors during COVID-19 pandemic?. *Cogent Economics & Finance*, 11(1), 2169998.
- Afonso, A., & de Sá Fortes Leitão Rodrigues, E. (2024). Consumption patterns of indebted households: unravelling the relevance of fiscal policy. *International Journal of Economic Policy Studies*, 1-27.
- Aghion, P., Comín, D., Howitt, P., & Tecu, I. (2006). When Does Domestic Savings Matter for Economic Growth? *IMF Economic Review*, 64, 381-407.
- Aghion, P., Comin, D., Howitt, P., & Tecu, I. (2010). When does domestic saving matter for economic growth? Harvard University Working Paper.
- Agu, E. E., Abhulimen, A. O., Obiki-Osafiele, A. N., Osundare, O. S., Adeniran, I. A., & Efunniyi, C. P. (2024). Proposing strategic models for integrating financial literacy into national public education systems. *International Journal of Frontier Research in Science*, 3(2), 010-019.
- Atkinson, A., & Messy, F.-A. (2011). Assessing financial literacy in 12 countries: An OECD/INFE international pilot exercise. *Journal of Pension Economics and Finance*, 10(4), 657–665.
- Atkinson, A., & Messy, F.-A. (2012). Measuring financial literacy: Results of the OECD/International Network on Financial Education (INFE) Pilot Study. *OECD Working Papers on Finance, Insurance and Private Pensions*.
- Attanasio, O., Picci, L., & Scorcù, A. (2000). Saving, Growth, and Investment: A Macroeconomic Analysis Using a Panel of Countries. *Review of Economics and Statistics*, 82, 182-211.
- Babiarz, P., & Robb, C. (2014). Financial Literacy and Emergency Saving. *Journal of Family and Economic Issues*, 35, 40-50.
- Baiardi, D., Magnani, M., & Menegatti, M. (2020). The theory of precautionary saving: an overview of recent developments. *Review of Economics of the Household* 18(2), 513-542.
- Bollen, K. A. (1989). *Structural equations with latent variables* (Vol. 210). John Wiley & Sons.
- Burchi, A., Włodarczyk, B., Szturo, M., & Martelli, D. (2021). The effects of financial literacy on sustainable entrepreneurship. *Sustainability*, 13(9), 5070.
- Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. routledge.
- Cain, M. (2021). Structural equation modeling using Stata. *Journal of Behavioral Data Science*, 1(2), 156-177.
- Carroll, C. D., & Weil, D. N. (1994). Saving and growth: A reinterpretation. *Carnegie-Rochester Conference Series on Public Policy*.
- Dreze, J. H., & Modigliani, F. (1975). Consumption decisions under uncertainty. In *Stochastic Optimization Models in Finance* (pp. 459-486). Academic Press.

- Ehigiamusoe, K. U., & Lean, H. H. (2019). Do economic and financial integration stimulate economic growth? A critical survey. *Economics*, 13(1), 20190004.
- Fernandes, D., Lynch Jr, J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management science*, 60(8), 1861-1883.
- Freytag, A., & Voll, S. (2013). Institutions and savings in developing and emerging economies. *Public Choice*, 157, 475-509.
- Gómez-Balcácer, L., Somarriba Arechavala, N., & Gómez-Costilla, P. (2023). The importance of different forms of social capital for happiness in Europe: a multilevel structural equation model (GSEM). *Applied Research in Quality of Life*, 18(1), 601-624.
- Grimes, P. W., Rogers, K. E., & Bosshardt, W. D. (2021). Economic education and household financial outcomes during the financial crisis. *Journal of Risk and Financial Management*, 14(7), 316.
- Guan, F. (2025). The Impact of Financial Literacy on Household Property Income: An Empirical Analysis Based on CHFS Data. *Finance Research Letters*, 107558.
- Hair Jr, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate data analysis. In *Multivariate data analysis* (pp. 785-785).
- Harrod, R. F. (1939). "An Essay in Dynamic Theory." *the Economic Journal*, 49(193), 14-33.
- Hastings, J. S., Madrian, B. C., & Skimmyhorn, W. L. (2013). Financial literacy, financial education, and economic outcomes. *Annual Review of Economics*.
- Hesketh, S. R., & Skrondal, A. (2021). *Multilevel and longitudinal modeling using Stata*. STATA press.
- Hesketh, S. R., & Skrondal, A. (2021). *Multilevel and longitudinal modeling using Stata*. STATA press.
- Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. *Fed. Res. Bull.*, 89, 309.
- Hizgilov, A., & Silber, J. (2020). On Multidimensional Approaches to Financial Literacy Measurement. *Social Indicators Research*, 148, 787-830.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*.
- Kasman, M., Heuberger, B., & Hammond, R. A. (2018). A review of large scale youth financial literacy education policies and programs. *The Brookings Institution*.
- Keynes, J. M. (1936). *The General Theory of Employment, Interest, and Money*. Harcourt Brace.
- Kimball, M. S. (1990). Precautionary saving and the marginal propensity to consume. National Bureau of Economic Research. *Working Paper* 3403.
- Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications.
- Laibson, D. (1997). Golden Eggs and Hyperbolic Discounting. *The Quarterly Journal of Economics*, 112(2), 443-478.

- Leland, H. E. (1978). Saving and uncertainty: The precautionary demand for saving. *In Uncertainty in economics* (pp. 127-139). Academic Press.
- Liu, T., Fan, M., Li, Y., & Yue, P. (2024). Financial literacy and household financial resilience. *Finance Research Letters*, 63, 105378.
- Lusardi, A. (2019). Financial Literacy and the need for financial education in the new era. *Financial Services Review*, 28(1), 7-17.
- Lusardi, A., & Mitchell, O. S. (2008). Planning and financial literacy: How do women fare? *American Economic Review*, 98(2), 413–417.
- Lusardi, A., & Mitchell, O. S. (2011). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Financial Services Review*, 20(4), 293-317.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *American Economic Journal: Journal of Economic Literature*, 52(1), 5-44.
- Lusardi, A., Mitchell, O. S., & Curto, V. (2011). Financial literacy among the young. *Journal of Consumer Affairs*.
- Mason, A. (1988). Saving economic growth and demographic change. *Population and Development Review*, 14, 113.
- Mian, A. R., Straub, L., & Sufi, A. (2021). What explains the decline in  $r^*$ ? Rising income inequality versus demographic shifts. *Rising Income Inequality Versus Demographic Shifts (September 22, 2021)*. University of Chicago, Becker Friedman Institute for Economics Working Paper, (2021-104).
- Ngabo M, V., Atuhaire, L., & Rutayisire, P. C. (2022). Modelling the risk factors of malnutrition among the children below five years of age in Uganda: A GSEM-based analysis. *medRxiv*, 2022-04.
- OECD (2013). *OECD/INFE toolkit for measuring financial literacy and financial inclusion*. OECD Publishing.
- OECD (2020). *OECD/INFE International Survey of Adult Financial Literacy*. OECD Publishing.
- Paşa, A., Picatoste, X., & Gherghina, E. (2022). Financial Literacy and Economic Growth: How Eastern Europe is Doing?. *Economics*, 16, 27 - 42.
- Potrich, A., Vieira, K., & Mendes-Da-Silva, W. (2016). Development of a financial literacy model for university students. *Management Research Review*, 39, 356-376.
- Ramsey, F. P. (1928). "A Mathematical Theory of Saving." *The Economic Journal*, 38(152), 543-559.
- S&P Global Financial Literacy Survey. (2021). *Global Financial Literacy Survey: A global view of financial literacy and retirement readiness*. S&P Global.
- Schmidt-Hebbel, K., Serven, L., & Solimano, A. (1996). Saving and investment: paradigms, puzzles, policies. *World Bank Research Observer*, 11, 87-117.
- Schumacker, R. E., & Lomax, R. G. (2015). *A Beginner's Guide to Structural Equation Modeling*.
- Shefrin, H., & Thaler, R. H. (2020). Behavioral life-cycle theory. *Economic Inquiry*.

- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*.
- Stiglitz, J. E. (1981). The economics of information. *Journal of Political Economy*.
- Thaler, R. H. (1994). *The Winner's Curse: Paradoxes and Anomalies of Economic Life*. Princeton University Press.
- Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow: Using behavioral economics to increase employee saving. *Journal of Political Economy*.
- Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101(2), 449-472.
- Web of Science. (n.d.). Accessed from <https://www.webofscience.com>. December 2024.
- Winters, K. C., & Derevensky, J. L. (2019). A review of sports wagering: Prevalence, characteristics of sports bettors, and association with problem gambling. *Journal of Gambling Issues*, 43.
- Zaimovic, A., Torlakovic, A., Arnaut-Berilo, A., Zaimovic, T., Dedović, L., & Meskovic, M. (2023). Mapping Financial Literacy: A Systematic Literature Review of Determinants and Recent Trends. *Sustainability*.
- Zhou, X., Zhou, L., & Yang, J. (2025). Digital inclusive finance and rural entrepreneurial survival: The moderating role of digital and financial literacy. *Economic Analysis and Policy*, 86, 1119–1136.
- Zucman, G. (2019). Global wealth inequality. *Annual Review of Economics*.

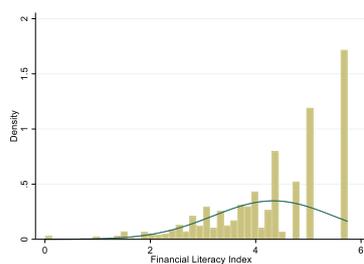
## Appendix

**Table A1 - Latent Model (Financial Literacy)**

Dependent Variable	Financial Literacy
CheckAcc	1
UsedCC	1.082673*** (0.02663)
PaidCC(Full)	1.44902*** (0.04493)
DiffEmerge30d	0.702929*** (0.02324)
FinWorried	0.477312*** (0.017399)
<b>Pseudo R<sup>2</sup></b>	
<b>Prob&gt;chi<sup>2</sup></b>	0.00000
<b>AIC</b>	202163.8
<b>BIC</b>	202237.8
<b>Countries</b>	136
<b>Observations</b>	27,525

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

**Figure A1 – Financial Literacy Index**



Source: authors' calculations.

## Online Appendix

### Table A2 - Statistics by Country (% Total)

Economy	%Total						
	Age < =42	Check Acc	Used CC	Paid CC Full	Saved Old Age	Saved Fin Inst	Saved
Albania	45.0%	65.0%	72.5%	90.0%	47.5%	77.5%	32.5%
Algeria	65.9%	56.8%	81.8%	56.8%	56.8%	81.8%	47.7%
Argentina	32.2%	77.2%	92.7%	76.7%	28.2%	54.8%	27.1%
Armenia	56.9%	75.9%	81.0%	50.0%	25.9%	63.8%	15.5%
Australia	11.9%	88.8%	92.7%	87.8%	72.4%	84.7%	66.4%
Austria	27.0%	67.6%	87.1%	93.0%	69.6%	93.8%	76.7%
Azerbaijan	35.8%	74.1%	86.4%	69.1%	13.6%	25.9%	6.2%
Bangladesh	100.0%	33.3%	33.3%	33.3%	0.0%	50.0%	0.0%
Belgium	27.2%	90.9%	85.0%	88.3%	71.3%	81.9%	70.3%
Benin	80.0%	73.3%	73.3%	60.0%	33.3%	93.3%	20.0%
Bolivia	69.2%	48.3%	65.0%	57.5%	49.2%	81.7%	48.3%
Bosnia and Herzegovina	39.1%	76.4%	69.8%	90.2%	32.4%	60.0%	41.3%
Botswana	80.0%	87.5%	78.8%	48.8%	56.3%	83.7%	46.3%
Brazil	55.7%	85.4%	92.1%	78.2%	49.9%	64.4%	40.1%
Bulgaria	39.2%	81.2%	75.2%	74.0%	37.6%	64.0%	36.8%
Burkina Faso	56.3%	50.0%	75.0%	56.3%	37.5%	78.1%	53.1%
Cambodia	33.3%	100.0%	66.7%	66.7%	0.0%	66.7%	66.7%
Cameroon	80.0%	60.0%	80.0%	66.7%	53.3%	100.0%	46.7%
Canada	26.0%	85.6%	96.3%	80.7%	74.0%	85.3%	69.4%
Chad	78.0%	68.3%	73.2%	63.4%	56.1%	87.8%	53.7%
Chile	43.5%	81.5%	74.0%	72.5%	50.5%	72.5%	41.5%
Colombia	54.9%	69.5%	82.9%	61.6%	47.0%	64.0%	39.6%
Comoros	58.8%	47.1%	70.6%	29.4%	35.3%	52.9%	41.2%
Congo, Dem. Rep.	92.3%	69.2%	69.2%	69.2%	53.8%	100.0%	30.8%
Congo, Rep.	60.0%	60.0%	66.7%	46.7%	46.7%	80.0%	40.0%
Costa Rica	38.2%	78.9%	87.4%	78.4%	64.8%	80.9%	53.3%
Croatia	30.8%	83.5%	80.5%	93.8%	42.4%	61.4%	47.3%
Cyprus	36.0%	85.7%	91.2%	81.6%	44.7%	59.4%	43.6%
Czechia	29.0%	92.0%	85.0%	92.0%	77.0%	90.0%	78.3%
Côte d'Ivoire	84.8%	69.7%	66.7%	60.6%	48.5%	78.8%	42.4%
Denmark	36.0%	98.2%	75.8%	94.5%	79.9%	91.2%	69.0%
Dominican Republic	54.8%	53.9%	72.2%	59.1%	36.5%	60.0%	27.8%
Ecuador	58.6%	65.5%	72.4%	56.9%	33.3%	56.9%	27.6%
Egypt, Arab Rep.	44.8%	48.3%	79.3%	41.4%	44.8%	58.6%	34.5%
El Salvador	71.4%	60.0%	74.3%	62.9%	40.0%	65.7%	37.1%
Estonia	32.9%	98.9%	73.4%	88.4%	78.9%	89.5%	73.2%
Eswatini	76.7%	81.4%	69.8%	48.8%	74.4%	95.3%	46.5%
Ethiopia	50.0%	50.0%	50.0%	100.0%	100.0%	100.0%	50.0%
Finland	23.0%	98.2%	78.4%	91.0%	75.3%	85.4%	63.4%

France	33.1%	74.0%	82.7%	84.0%	60.2%	77.0%	44.7%
Gabon	75.0%	64.3%	75.0%	64.3%	67.9%	92.9%	50.0%
Gambia, The	81.8%	72.7%	72.7%	63.6%	72.7%	90.9%	54.5%
Georgia	35.5%	81.5%	89.5%	57.3%	21.8%	44.4%	12.9%
Germany	19.8%	67.4%	80.8%	91.0%	62.9%	85.5%	66.3%
Ghana	100.0%	70.0%	30.0%	70.0%	80.0%	100.0%	70.0%
Greece	26.9%	91.2%	83.3%	75.4%	49.1%	62.9%	37.4%
Guatemala	76.1%	47.8%	69.6%	80.4%	32.6%	67.4%	37.0%
Guinea	72.7%	45.5%	90.9%	63.6%	36.4%	90.9%	36.4%
Honduras	63.3%	53.3%	63.3%	60.0%	26.7%	70.0%	36.7%
Hong Kong SAR, China	43.7%	86.5%	96.6%	94.5%	73.7%	81.1%	56.1%
Hungary	16.7%	90.3%	75.9%	85.2%	56.0%	73.1%	56.0%
Iceland	30.9%	94.3%	94.3%	94.9%	77.9%	88.7%	74.8%
India	73.1%	64.2%	66.4%	56.0%	34.3%	53.7%	25.4%
Indonesia	68.0%	40.0%	60.0%	44.0%	60.0%	84.0%	48.0%
Iran, Islamic Rep.	73.1%	67.2%	83.6%	64.2%	41.8%	59.7%	31.3%
Iraq	86.4%	68.2%	72.7%	63.6%	36.4%	81.8%	31.8%
Ireland	37.6%	79.5%	88.1%	90.7%	64.4%	86.8%	61.6%
Israel	40.8%	74.0%	94.6%	92.8%	75.3%	83.6%	60.5%
Italy	22.6%	75.7%	85.6%	91.7%	54.6%	79.8%	49.4%
Jamaica	59.5%	52.4%	61.9%	57.1%	54.8%	83.3%	61.9%
Japan	22.0%	45.1%	86.2%	93.2%	74.8%	89.3%	70.9%
Jordan	63.4%	80.5%	82.9%	58.5%	19.5%	58.5%	12.2%
Kazakhstan	70.6%	93.9%	87.8%	57.4%	42.6%	56.9%	20.8%
Kenya	87.5%	78.1%	67.2%	46.9%	51.6%	85.9%	46.9%
Korea, Rep.	27.0%	85.1%	98.3%	96.2%	69.9%	78.3%	66.2%
Kosovo	41.9%	50.7%	71.3%	83.8%	27.2%	50.0%	25.7%
Kyrgyz Republic	59.3%	85.2%	85.2%	48.1%	48.1%	63.0%	18.5%
Lao PDR	71.4%	85.7%	42.9%	71.4%	71.4%	85.7%	71.4%
Latvia	42.3%	93.8%	76.4%	77.9%	62.5%	80.8%	53.8%
Lebanon	51.4%	40.0%	68.6%	42.9%	22.9%	51.4%	37.1%
Lesotho	69.5%	66.1%	54.2%	45.8%	62.7%	88.1%	32.2%
Liberia	77.4%	64.5%	67.7%	64.5%	48.4%	83.9%	38.7%
Lithuania	39.3%	94.8%	61.5%	89.6%	68.1%	87.4%	72.6%
Madagascar	61.5%	65.4%	84.6%	73.1%	46.2%	76.9%	46.2%
Malawi	75.0%	62.5%	62.5%	25.0%	50.0%	100.0%	37.5%
Malaysia	54.5%	85.5%	80.0%	69.1%	80.0%	94.5%	85.5%
Mali	59.3%	52.5%	50.8%	59.3%	54.2%	78.0%	42.4%
Malta	36.0%	82.9%	80.5%	85.9%	61.4%	82.4%	67.9%
Mauritania	82.9%	71.4%	60.0%	57.1%	57.1%	80.0%	31.4%
Mauritius	35.3%	77.7%	70.5%	79.9%	59.4%	77.2%	56.7%
Mexico	61.7%	71.6%	86.4%	75.3%	42.0%	74.1%	38.3%
Moldova	59.7%	82.3%	82.3%	66.1%	25.8%	72.6%	29.0%
Mongolia	67.9%	94.6%	85.7%	80.4%	41.1%	58.9%	26.8%
Morocco	55.6%	66.7%	55.6%	66.7%	55.6%	88.9%	44.4%

Mozambique	83.8%	72.6%	73.5%	43.6%	38.5%	76.1%	34.2%
Myanmar	85.7%	82.1%	57.1%	67.9%	57.1%	82.1%	60.7%
Namibia	67.3%	85.0%	80.3%	68.0%	72.8%	87.1%	59.2%
Nepal	60.0%	56.0%	72.0%	76.0%	48.0%	72.0%	32.0%
Netherlands	24.3%	96.1%	77.4%	97.3%	84.5%	92.7%	71.6%
New Zealand	16.5%	93.1%	93.4%	83.4%	79.7%	90.9%	78.0%
Nicaragua	58.1%	51.6%	80.6%	77.4%	48.4%	90.3%	45.2%
Niger	73.3%	53.3%	73.3%	33.3%	53.3%	80.0%	33.3%
Nigeria	85.0%	90.0%	70.0%	70.0%	65.0%	100.0%	55.0%
North Macedonia	44.4%	68.4%	76.5%	76.9%	26.1%	47.9%	26.5%
Norway	26.0%	99.2%	86.0%	91.2%	90.8%	94.9%	77.7%
Pakistan	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Panama	60.3%	84.1%	77.8%	55.6%	54.0%	77.8%	38.1%
Paraguay	64.0%	60.0%	64.0%	56.0%	48.0%	60.0%	36.0%
Peru	69.8%	55.6%	81.0%	61.1%	35.7%	59.5%	31.0%
Philippines	74.8%	84.9%	77.3%	68.9%	79.8%	94.1%	78.2%
Poland	35.3%	91.7%	83.8%	89.8%	51.9%	71.4%	54.5%
Portugal	33.9%	82.9%	71.7%	81.6%	62.2%	79.0%	57.6%
Romania	41.5%	78.7%	82.0%	89.1%	39.3%	62.3%	41.0%
Russian Federation	52.4%	96.1%	82.8%	60.5%	24.5%	39.0%	15.9%
Saudi Arabia	94.3%	89.5%	86.5%	79.1%	60.1%	76.7%	36.8%
Senegal	75.0%	76.8%	73.2%	57.1%	58.9%	92.9%	41.1%
Serbia	52.2%	80.0%	71.1%	93.9%	32.2%	62.2%	33.9%
Sierra Leone	57.1%	71.4%	28.6%	28.6%	28.6%	85.7%	28.6%
Singapore	52.0%	91.7%	93.7%	94.8%	78.4%	95.7%	80.5%
Slovak Republic	30.5%	89.7%	80.7%	89.1%	73.7%	87.3%	72.5%
Slovenia	21.4%	83.2%	83.4%	96.0%	59.0%	78.4%	63.0%
South Africa	73.3%	90.1%	84.0%	72.5%	81.7%	91.6%	56.5%
South Sudan	100.0%	100.0%	100.0%	50.0%	100.0%	100.0%	100.0%
Spain	31.0%	82.9%	83.0%	86.7%	56.4%	82.3%	51.4%
Sri Lanka	63.4%	54.2%	78.9%	62.7%	61.3%	70.4%	33.8%
Sweden	16.6%	97.3%	79.5%	91.6%	87.8%	92.9%	77.3%
Switzerland	25.8%	68.8%	84.6%	87.9%	55.3%	84.7%	61.5%
Tajikistan	54.5%	50.0%	81.8%	90.9%	4.5%	27.3%	0.0%
Tanzania	66.7%	83.3%	83.3%	66.7%	66.7%	100.0%	50.0%
Thailand	51.7%	95.1%	90.3%	81.5%	79.6%	90.3%	78.1%
Togo	75.0%	55.0%	70.0%	45.0%	60.0%	95.0%	25.0%
Tunisia	48.3%	75.9%	86.2%	65.5%	48.3%	72.4%	37.9%
Türkiye	59.5%	86.5%	92.1%	58.1%	22.0%	37.2%	22.9%
Uganda	88.9%	77.8%	75.6%	48.9%	71.1%	97.8%	48.9%
Ukraine	51.3%	92.6%	82.1%	67.2%	19.5%	45.4%	20.3%
United Arab Emirates	87.7%	65.3%	75.0%	62.3%	15.7%	43.6%	25.0%
United Kingdom	19.6%	73.6%	80.6%	79.5%	64.1%	86.0%	61.9%
United States	24.6%	82.5%	94.9%	76.3%	79.9%	88.8%	73.3%
Uruguay	35.7%	63.2%	89.2%	77.9%	29.7%	50.7%	33.4%

Uzbekistan	58.6%	93.1%	65.5%	69.0%	10.3%	58.6%	24.1%
Venezuela, RB	41.3%	88.0%	24.4%	67.6%	16.4%	46.7%	13.3%
Vietnam	90.2%	87.8%	80.5%	65.9%	56.1%	78.0%	43.9%
West Bank and Gaza	51.2%	69.8%	55.8%	58.1%	32.6%	67.4%	25.6%
Yemen, Rep.	44.4%	100.0%	100.0%	77.8%	88.9%	88.9%	66.7%
Zambia	90.5%	85.7%	90.5%	47.6%	61.9%	95.2%	23.8%
Zimbabwe	50.0%	90.0%	70.0%	50.0%	20.0%	60.0%	30.0%

Source: authors' calculations.

**Table A3- Statistics by Country (Mean)**

Economy	Mean		
	Age	Education Level	Income Quintile
Albania	44.2	2.4	4.3
Algeria	36.9	2.3	3.9
Argentina	48.4	2.3	4.0
Armenia	40.9	2.4	3.8
Australia	60.9	2.5	3.3
Austria	51.9	2.3	3.5
Azerbaijan	45.2	2.3	4.0
Bangladesh	25.3	1.8	3.0
Belgium	54.4	2.6	3.5
Benin	36.9	1.7	4.1
Bolivia	35.7	2.3	3.6
Bosnia and Herzegovina	44.0	2.4	3.8
Botswana	34.0	2.2	3.9
Brazil	40.9	2.4	4.0
Bulgaria	45.1	2.5	3.9
Burkina Faso	38.7	1.6	4.1
Cambodia	43.3	1.7	4.3
Cameroon	32.0	2.0	3.6
Canada	53.6	2.5	3.3
Chad	33.0	1.5	3.4
Chile	45.0	2.2	3.5
Colombia	41.8	2.5	4.4
Comoros	39.2	1.9	4.0
Congo, Dem. Rep.	26.8	2.3	3.4
Congo, Rep.	39.7	1.9	3.7
Costa Rica	45.5	2.6	4.2
Croatia	49.7	2.5	3.7
Cyprus	47.5	2.6	3.6
Czechia	50.0	2.4	3.3
Côte d'Ivoire	32.8	2.0	4.1
Denmark	46.9	2.4	3.4

Dominican Republic	40.6	2.2	3.8
Ecuador	39.3	2.3	4.0
Egypt, Arab Rep.	45.7	2.2	3.9
El Salvador	36.5	2.0	4.0
Estonia	47.3	2.6	3.5
Eswatini	33.5	2.4	4.1
Ethiopia	52.0	1.5	4.5
Finland	53.3	2.3	3.5
France	49.6	2.4	3.4
Gabon	34.3	2.1	3.6
Gambia, The	32.6	2.2	4.6
Georgia	45.4	2.6	3.9
Germany	55.2	2.3	3.5
Ghana	30.4	2.4	4.1
Greece	49.9	2.7	3.9
Guatemala	32.8	1.9	3.9
Guinea	37.5	1.9	4.1
Honduras	39.6	1.8	3.9
Hong Kong SAR, China	45.2	2.4	3.4
Hungary	53.9	2.6	3.7
Iceland	51.0	2.2	3.2
India	35.0	2.0	3.9
Indonesia	35.0	2.1	3.5
Iran, Islamic Rep.	35.3	2.2	3.3
Iraq	29.8	2.2	3.5
Ireland	47.8	2.4	3.2
Israel	47.0	2.4	3.4
Italy	54.3	2.1	3.5
Jamaica	40.8	2.0	3.6
Japan	55.7	2.3	3.3
Jordan	39.2	2.5	4.1
Kazakhstan	36.4	2.6	3.4
Kenya	29.6	1.9	3.8
Korea, Rep.	51.6	2.5	3.3
Kosovo	44.1	2.0	3.6
Kyrgyz Republic	39.7	2.3	3.4
Lao PDR	37.3	2.3	3.9
Latvia	44.1	2.6	3.5
Lebanon	42.5	2.5	4.2
Lesotho	36.4	1.9	3.7
Liberia	31.5	1.5	3.0
Lithuania	45.5	2.7	3.7
Madagascar	37.6	1.8	4.3
Malawi	29.8	1.5	3.1
Malaysia	41.4	2.4	4.2

Mali	38.3	1.6	3.4
Malta	47.1	2.4	3.5
Mauritania	34.3	2.0	3.9
Mauritius	46.8	2.4	4.0
Mexico	38.2	2.2	4.1
Moldova	41.0	2.2	3.9
Mongolia	35.9	2.3	3.7
Morocco	42.0	2.4	4.4
Mozambique	29.6	1.7	3.9
Myanmar	32.2	2.6	4.6
Namibia	36.2	2.1	4.1
Nepal	36.5	2.0	3.8
Netherlands	54.1	2.7	3.8
New Zealand	57.7	2.4	3.4
Nicaragua	38.4	2.1	3.7
Niger	32.0	1.7	4.1
Nigeria	33.6	2.0	4.3
North Macedonia	43.8	2.3	3.6
Norway	51.9	2.7	3.5
Pakistan	40.0	3.0	4.7
Panama	37.7	2.4	3.9
Paraguay	38.8	2.4	4.4
Peru	35.2	2.1	3.8
Philippines	35.5	2.6	4.6
Poland	48.7	2.7	3.6
Portugal	47.9	2.3	3.7
Romania	44.9	2.5	3.8
Russian Federation	41.7	2.5	3.4
Saudi Arabia	29.1	2.6	3.7
Senegal	34.4	1.7	3.8
Serbia	41.0	2.4	3.7
Sierra Leone	37.3	2.1	4.6
Singapore	41.9	2.5	3.6
Slovak Republic	48.9	2.5	3.5
Slovenia	52.6	2.2	3.7
South Africa	36.1	2.4	4.3
South Sudan	36.5	2.0	5.0
Spain	49.2	2.1	3.6
Sri Lanka	36.3	2.1	4.0
Sweden	55.1	2.6	3.5
Switzerland	51.9	2.4	3.4
Tajikistan	40.1	2.3	3.8
Tanzania	33.5	1.3	4.2
Thailand	41.7	2.7	4.1
Togo	32.1	2.2	3.8

Tunisia	42.9	2.3	4.0
Türkiye	39.7	2.3	3.9
Uganda	27.4	1.9	3.8
Ukraine	41.4	2.7	3.7
United Arab Emirates	30.1	2.6	3.2
United Kingdom	55.1	2.4	3.4
United States	56.3	2.5	3.6
Uruguay	49.9	1.9	3.9
Uzbekistan	39.6	2.3	3.7
Venezuela, RB	43.2	2.5	3.8
Vietnam	31.0	2.3	3.9
West Bank and Gaza	41.8	2.3	4.1
Yemen, Rep.	43.4	2.9	4.8
Zambia	31.0	2.0	4.8
Zimbabwe	42.8	2.5	4.1

Source: authors' calculations.

**Table A4 - Structural Model (Full Sample) - Robustness**

Dependent Variable	Savings (Full Sample)		
	Model 1 Saved	Model 2 Saved For Old Age	Model 3 Saved in Fin. Institution
<b>AgeBin (&lt;=42)</b>	0.2425682*** (0.0314841)	-0.3357546*** (0.0262739)	-0.0581295** (0.0268973)
<b>Education Level</b>	0.1253082*** (0.0256264)	0.2000434*** (0.0221593)	0.2644516*** (0.0225173)
<b>Income (Quintile)</b>	0.1299772*** (0.0112126)	0.0981144*** (0.0097272)	0.0814069*** (0.0098842)
<b>Financial Literacy</b>	0.5400604*** (0.0135547)	0.5016136*** (0.0122097)	0.5562723*** (0.0124362)
<b>Constant</b>	-1.859379*** (0.0775541)	-2.669338*** (0.0719406)	-2.872152*** (0.0731242)
<b>Pseudo R<sup>2</sup></b>	0.076795	0.07386	0.08234
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	27260.79	35098.43	33995.07
<b>BIC</b>	27301.90	35139.54	34036.18
<b>Countries</b>		136	
<b>Observations</b>		27,525	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

**Table A5 - Structural Model (High Income) - Robustness**

<b>Savings (High Income)</b>			
<b>Dependent Variable</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
	<b>Saved</b>	<b>Saved For Old Age</b>	<b>Saved in Fin. Institution</b>
<b>AgeBin (&lt;=42)</b>	0.2483544*** (0.0444415)	-0.258125*** (0.0333349)	0.0176192 (0.0350215)
<b>Education Level</b>	0.3424588*** (0.0339298)	0.2997276*** (0.0270401)	0.3959593*** (0.027926)
<b>Income (Quintile)</b>	0.1693302*** (0.0146691)	0.1449909*** (0.0116247)	0.1198775*** (0.0120235)
<b>Financial Literacy</b>	0.3959188*** (0.0186222)	0.3406236*** (0.0158036)	0.3994628*** (0.0161408)
<b>Constant</b>	-1.576875*** (0.1095908)	-2.099597*** (0.0929536)	-2.365019*** (0.0955376)
<b>Pseudo R<sup>2</sup></b>	0.05141	0.04194	0.04942
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	16621.51	24153.5	22853.72
<b>BIC</b>	16660.82	24192.8	22893.02
<b>Countries</b>		46	
<b>Observations</b>		19,173	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

**Table A6 - Structural Model (Low Income) - Robustness**

Dependent Variable	Savings (Low Income)		
	Model 7	Model 8	Model 9
	Saved	Saved For Old Age	Saved in Fin. Institution
<b>AgeBin (&lt;=42)</b>	0.6340136*** (0.0483242)	0.0076017 (0.0479038)	0.281875*** (0.0470912)
<b>Education Level</b>	-0.1646662 (0.0406165)	-0.0131517 (0.040793)	0.0307491 (0.0398048)
<b>Income (Quintile)</b>	0.2718822*** (0.0193988)	0.26352*** (0.0211278)	0.2588715*** (0.0201699)
<b>Financial Literacy</b>	0.4085947*** (0.0236803)	0.4282896*** (0.024894)	0.4470177*** (0.0241988)
<b>Constant</b>	-1.997838*** (0.1191913)	-3.337272*** (0.1325281)	-3.375174*** (0.1287568)
<b>Pseudo R<sup>2</sup></b>	0.0723	0.0619	0.0686
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	10088.5	10210.2	10541.8
<b>BIC</b>	10123.7	10245.4	10577.0
<b>Countries</b>		90	
<b>Observations</b>		8,352	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

**Table A7 - Structural Model (Latin America) - Robustness**

<b>Savings (Latin America)</b>			
<b>Dependent Variable</b>	<b>Model 10</b>	<b>Model 11</b>	<b>Model 12</b>
	<b>Saved</b>	<b>Saved For Old Age</b>	<b>Saved in Fin. Institution</b>
<b>AgeBin (&lt;=42)</b>	0.7058306*** (0.0780314)	-0.058181 (0.0719507)	0.2452731*** (0.0730945)
<b>Education Level</b>	0.3098707*** (0.0627609)	0.26945*** (0.0610098)	0.4696907*** (0.0620555)
<b>Income (Quintile)</b>	0.0568453* (0.0300581)	0.0284593 (0.0291877)	0.0269406 (0.0294127)
<b>Financial Literacy</b>	0.8282403*** (0.0474634)	0.8774677*** (0.047003)	0.9727847*** (0.0482002)
<b>Constant</b>	-2.598703 *** (0.2166839)	-3.394421*** (0.1910845)	-4.035187 *** (0.2338106)
<b>Pseudo R<sup>2</sup></b>	0.11201	0.10307	0.13237
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	4192.453	4582.354	4495.418
<b>BIC</b>	4223.585	4613.485	4526.550
<b>Countries</b>		20	
<b>Observations</b>		3,738	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.

**Table A8 - Structural Model (Europe) - Robustness**

Dependent Variable	Savings (Europe)		
	Model 13	Model 14	Model 15
	Saved	Saved For Old Age	Saved in Fin. Institution
<b>AgeBin (&lt;=42)</b>	0.4311004*** (0.0859029)	-0.0375845 (0.0557013)	0.157396*** (0.0598437)
<b>Education Level</b>	0.3022481*** (0.0562979)	0.2915049*** (0.04044)	0.3731968*** (0.0423726)
<b>Income (Quintile)</b>	0.1379653*** (0.0253815)	0.1308979*** (0.0180184)	0.0932433*** (0.189631)
<b>Financial Literacy</b>	0.2983555*** (0.0296406)	0.2393321*** (0.0227438)	0.2976044*** (0.0296406)
<b>Constant</b>	-0.8203606*** (0.1950526)	-1.657113*** (0.150158)	-1.80795*** (0.1554316)
<b>Pseudo R<sup>2</sup></b>	0.0347	0.02692	0.0340
<b>Prob&gt;chi<sup>2</sup></b>	0.00000	0.00000	0.00000
<b>AIC</b>	5871.953	9984.574	9239.027
<b>BIC</b>	5906.928	10019.55	9274.002
<b>Countries</b>		40	
<b>Observations</b>		8,064	

\*\*\* - significant at 1%; \*\* - significant at 5%; \* - significant at 10%.  
Standard deviations in brackets.