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Impact of Financial Literacy on Household Saving: Evidence from Hungary and Portugal

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Abstract. With economic globalization, the management of personal assets has become increasingly important, and rational saving behavior is also a crucial skill. Financial literacy is globally endorsed for enhancing economic resilience, the problem is that its impact on saving behavior remains context-dependent. This study investigates the relationship between financial literacy and household saving rate. This paper also explores whether higher financial literacy translates into higher personal saving rates across different national contexts. Using discontinuous time-series data for financial literacy scores, by constructing simple linear regression models for a comparative analysis between two distinct economies. The findings of this paper reveal a significant positive correlation in Portugal, whereas the relationship is statistically insignificant and highly unstable in Hungary, indicating that macroeconomic and institutional settings profoundly mediate this link. This research provides empirical support for tailoring financial education programs and informs policymakers on designing context-specific strategies to enhance public financial preparedness and protect household assets.

Keywords: Financial literacy, Household saving, OECD.

1. Introduction

Over the past decade, global savings rates have exhibited significant fluctuations, particularly between 2020 and 2023, data from OECD indicates global saving rates have decreased for certain degrees, influenced by macroeconomic shocks such as the COVID-19 pandemic and subsequent inflationary pressures. These trends highlight the critical role of household financial behavior in economic stability, as savings rates directly affect consumption patterns, investment capacity, and long-term financial resilience. Recognizing this linkage, international organizations such as the OECD and the World Bank have increasingly emphasized financial literacy as a key determinant of sound financial decision-making [1]. Defined by the OECD (2020) as "an individual's ability to understand financial concepts and make effective decisions," financial literacy shapes how households manage savings, debt, and investments. Given its growing policy relevance, this study investigates whether financial literacy significantly influences savings behavior and whether this relationship varies across different national contents.

This research examines how financial literacy impacts household saving behavior across different economic and institutional environments, contributing to the broader discourse on how financial

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education policies may enhance economic stability at both macro and micro levels. This study uses simple linear regression to empirically evaluate the impact of financial literacy on household savings rates. Portugal and Hungary were selected as two economies for comparative analysis, aiming to understand the differences in countries with different levels of financial literacy and savings cultures, and provide insights into how institutional and cultural factors regulate the relationship between literacy and savings. This study bridges the gap between micro level financial knowledge and macro level financial behavior, providing policy recommendations for financial education programs. This study's key contribution lies in its cross-national comparative approach, which extends prior single-country analyses and provides actionable insights for policymakers aiming to enhance savings behavior through targeted financial literacy initiatives.

2. Theoretical foundation and literature review

This paper adopts the assumptions of Human Capital Theory which suggest that financial knowledge as part of the human capital, will improve the individuals' resource allocation efficiency (e.g., through portfolio diversification) and strengthens their propensity to save [2]. In this study, financial knowledge is a part of financial literacy, therefore, before modeling, the author assume financial literacy will have a positive impact on saving rate. Another theory used is the Bounded Rationality, with more financial literacy, the cost of decision will decrease, and irrational consumption could be avoided [3]. In this study, with fewer irrational consumption, saving behavior will increase.

Seminal work by Lusardi & Mitchell established literacy as a predictor of retirement preparedness, measured via the Big Three questions (interest rates, inflation, risk diversification) [4]. In 2014, Karen C. Castro-Gonzlez conduct a questionnaire using some guidelines of Lusardi and Mitchell study, asking residents in Puerto Rico financial and retirement questions. The results draw to a conclusion that "Most people seem to be unprepared to take charge of financial decisions and retirement. The results suggest a lack of knowledge in financial and retirement planning, although respondents answered they look for information regarding financial and retirement matters" [5]. Lusardi and Mitchell refer financial literacy as reading and writing, pointing out the importance of being financially literate in today's society [4]. The life cycle hypothesis suggests that people smooth their consumption throughout their lives by adjusting their savings. In this paper, individual's behavior follows this rule. Time inconsistency explains low savings among less literate households, dynamic inconsistency implies individuals have trouble making plans that require sustained effort or delayed gratification [6]. This is another evidence of how behavior is affected. Prior studies predominantly use cross-sectional micro data (e.g., FinScope surveys, OECD INFE surveys), these surveys or questionnaires do indicate some useful data, but Existing studies predominantly employ panel or cross-sectional designs, with time-series analyses remaining scarce in this literature. The key innovation lies in employing time-series discontinuity data to examine the financial literacy-savings relationship, thereby enhancing the robustness of causal inference.

3. Data and variable description

To do the time series modeling, this paper use data from OECD, including Financial Literacy (FL) score and household saving rate. Table 1 shows the relevant variables used in the model.

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Table 1. The variables used in the model

Variable	Definition	Source	Period
Financial Literacy Score	Composite index (0-100) covering knowledge (35%), attitudes (20%), behaviors(45%)	OECD INFE Database	2016-2023(biennial)
Household Saving Rate	Saving as% of disposable income	OECD	2016-2023

For each country, the model constructed in this article is as follows:

$$SavingRate_t = \beta_0 + \beta_1 FinancialLiteracy_t + \varepsilon_t \quad (1)$$

Dependent variable ($SavingRate_t$) is annual household saving rate. Independent variable ($FinancialLiteracy_t$) is OECD INFE composite score, which represent Financial literacy for each country. It is important to mention that because the Financial literacy (FL) data are non-continuous, to adjust to time-series data with dependent variable, the data are linear auto adjust using simple linear model, there are only three year data, so it is necessary to do a simple fit (see Figures 1 and 2).

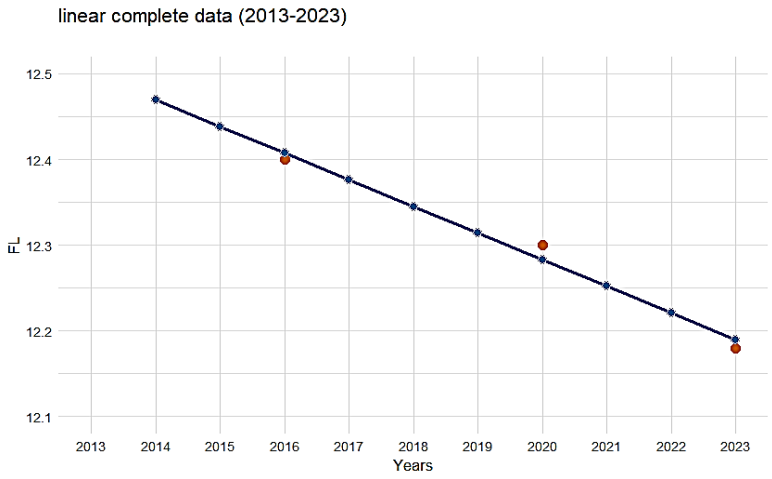

Figure 1. The linear fitting the FL non-continuous data (Hungary)

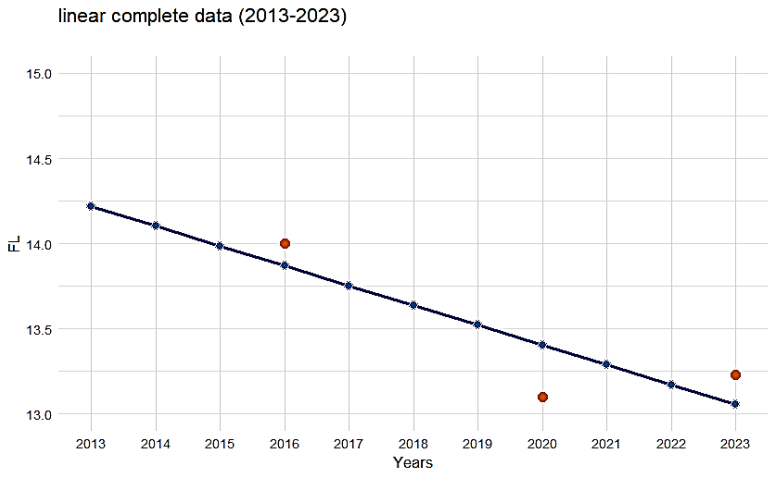

Figure 2. The linear fitting the FL non-continuous data (Portugal)

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Another adjustment to be mentioned is that in 2023 OECD FL score, they use a full score of 100, so it's necessary to adjust 2023 data to full score 21. This paper adds a random walk noise $\varepsilon \sim iid\ (0, \sigma^2)$ to enhance robustness and try to reduce the effect of time itself, adopting OLS regression with White robust standard errors. To examine the accuracy of the model, standards like Statistical significance ($p < 0.05$ threshold), Adjusted R^2 are taken to assess explanatory power, also using Shapiro-Wilk test to check residual normality. This paper also did a heterogeneity Analysis, which is a separate regression for knowledge, attitude, behavior sub-scores to identify drivers of cross-country differences. To uncover the drivers of cross-country differences between Portugal and Hungary, the author conducts a dimension-level heterogeneity analysis by decomposing the composite Financial Literacy Score into its three OECD-defined components, aiming to find the important element.

4. Empirical results and interpretation

In this part of the paper, the results of regression for two countries would be shown, and some previous expected insights would be discussed, providing some policy or strategy for further investment. Before modeling, guesses are these two data are positive correlated, that is, with a higher FL, saving rate would be higher, according to Lusardi and Mitchel's previous study [4].

4.1. Hungary

As shown in Figure 3, the household saving rate in Hungary performs an upward sloping trend, according to OECD data.

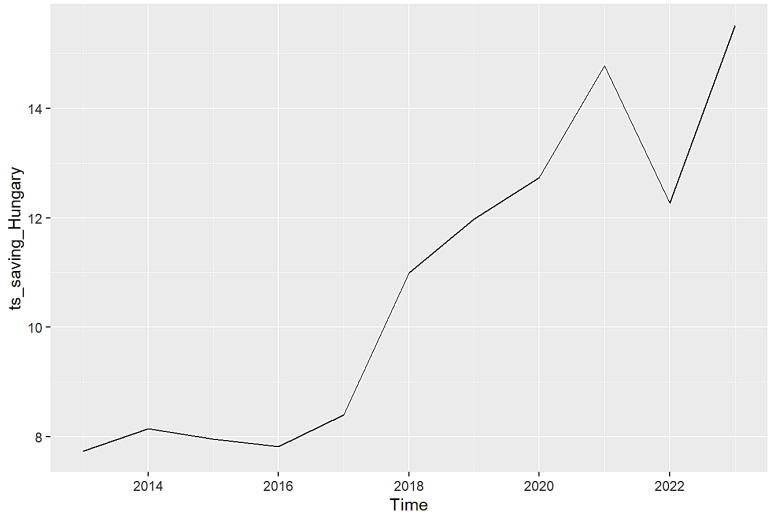

Figure 3. Hungary's saving rate time series

Table 2. Test index for Hungary regression

Adjusted R-squared	p-value
0.8215	0.0004

These test results of Table 2 imply that the model fits perfect for the data, therefore it is reasonable to use this result to explain.

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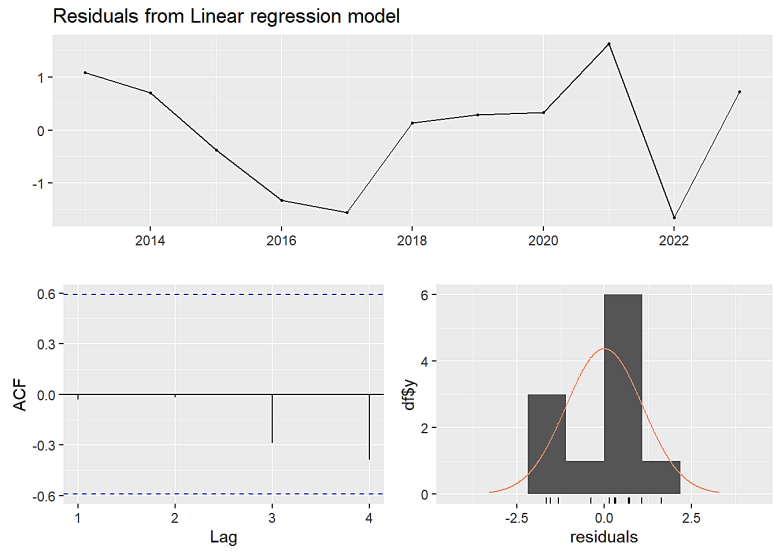

Figure 4. The residuals from linear regression model

Figure 4 indicates that the residuals from the model are believe to be white noise.

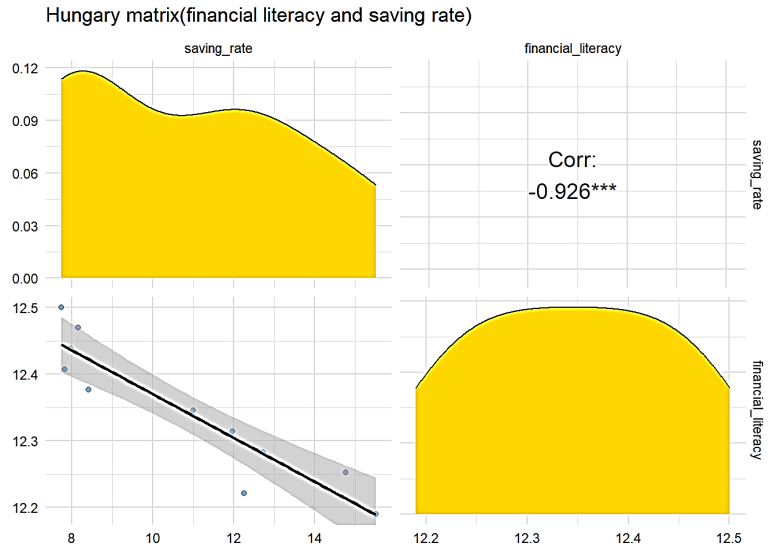

Figure 5. Hungary matrix (FL and saving rate)

Figure 5 indicate a strong negative correlation between Hungary's FL scores and its household saving rates. Some possible explanations are listed, for example, high negative NIIP in Hungary means an elevated level of external debt, so public and private sector indebtedness level would be high. That is because of the previous financial crisis [7].

Under the macro vulnerability signaled by a highly negative NIIP, the "low saving rate" observed among financially literate households in Hungary should be interpreted not as a simple lack of saving, but rather as a rational asset substitution and risk mitigation strategy. That is, Hungary high FL family would rather increase holdings of foreign currency assets or invest in real estate or gold. Since countries with a highly negative NIIP are more vulnerable to sudden reversals in international capital flows (capital flight), which can lead to sharp depreciation of the domestic currency.

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Financially literate individuals deeply understand this exchange rate risk. They fear the value of their domestic currency assets (particularly bank deposits) will erode.

High inflation eroding savings is another reason to be included. For a substantial part of this decade, the National Bank of Hungary grappled with elevated inflation rates. In such an environment, rational, financially literate individuals understand that holding cash or low-yield savings deposits leads to a rapid erosion of purchasing power. The OECD's definition of financial literacy includes an understanding of inflation. Therefore, those with higher financial literacy would be less inclined to leave money in traditional savings accounts with interest rates below inflation. They recognize that saving in this conventional sense is a guaranteed loss. The negative coefficient may thus reflect literate households actively dis-saving or diverting funds away from low-yield instruments measured in the national saving rate.

Due to Hungary’s rapid ageing (far more rapidly than most other EU countries) [8]. Hungary started second pillar pension schemes in 2010. Prominent examples are the reforms to funded 2nd pillar pension schemes. Starting with Hungary in 2010, most CEE countries rolled back from the 2nd pillar and shifted sizeable pension obligations to the general government [9]. This forced pension system will compel Hungarian households to allocate a greater portion of their disposable income to savings, but these savings would not be included in the household saving rate. Thus, it merely appears to categorize savings into different segments, highlighting a limitation in this statistical metric.

The negative coefficient is not a sign that financial literacy is harmful. Instead, it is a testament to its power. In the complex and often distorted economic landscape of Hungary (2013-2023), improved financial literacy did not lead to higher traditional savings because the rational incentives were powerfully aligned against it. Literate households were not ignorant; they were optimally responsive to a set of negative real returns on savings, generous subsidies for real estate and fertility, and accessible credit. They responded by diverting capital into real assets, human capital (children), and consumption, all of which are rational behaviors that are poorly captured by the narrow definition of the household saving rate. This analysis underscores a critical lesson: the outcome of financial literacy is profoundly shaped by the institutional and policy environment in which it is applied.

4.2. Portugal

The household saving rate in Portugal performs a downward sloping trend, according to OECD data (see Figure 6).

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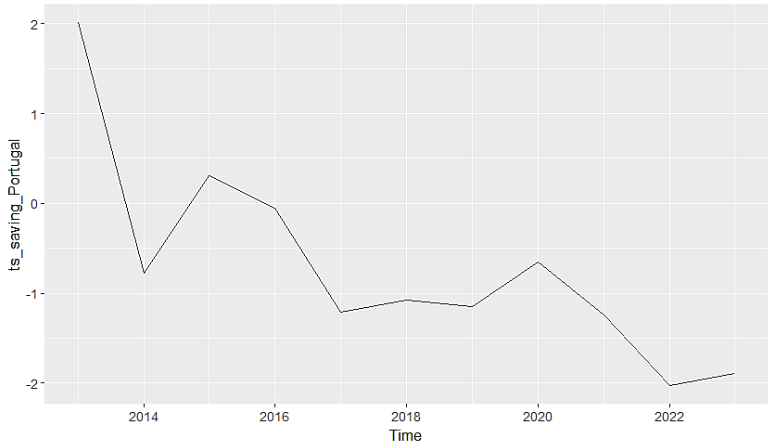

Figure 6. Portugal's saving rate time series

Table 3. Test index for Portugal regression

Adjusted R-squared	P-value
0.5599	0.01537

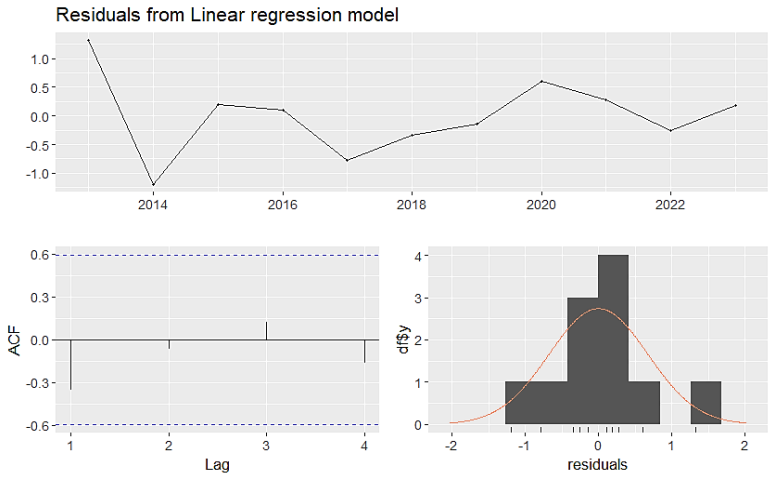

Figure 7. Residuals from linear regression model

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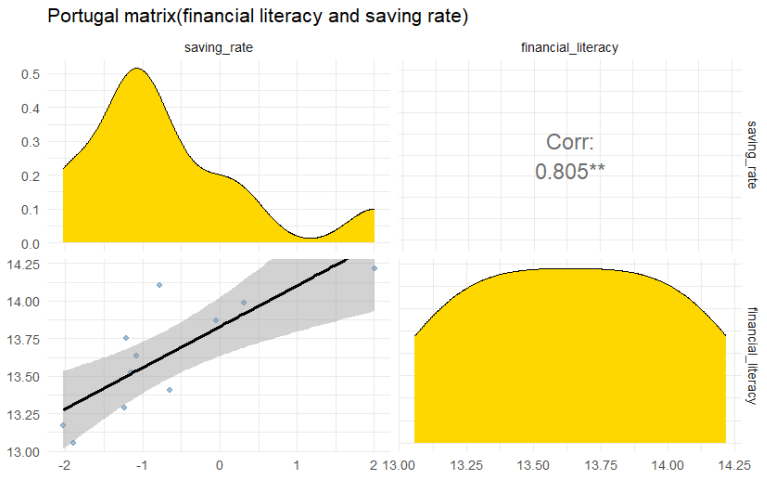

Figure 8. Portugal matrix (FL and saving rate)

These results show the same conclusion as Hungary: the model fits well, the only difference is that the financial literacy and saving rate are positive correlated for Portugal, following with some explanations (see Table 3 and Figures 7-8).

During the European debt crisis from 2011 to 2014, Portugal received an international bailout and implemented fiscal austerity measures and structural reforms (such as pension adjustments and tax increases). The pension reform and tax policies created incentives, which groups with higher financial literacy were better able to recognize and utilize. Policy incentives (such as tax deductions) amplify savings intention through framing design, while financial literacy enhances sensitivity to such framing [10].

Financially literate individuals are more likely to comprehend concepts such as compound interest, inflation, and retirement planning [3]. This knowledge incentives them to prioritize saving for future goals rather than immediate consumption.

Financial literacy often correlates with reduced behavioral biases (e.g., present bias or hyperbolic discounting). Literate households exhibit greater self-control in delaying gratification and adhering to savings plans.

Financially savvy households are more adept at leveraging tax-advantaged savings instruments (e.g., pension schemes, tax-free savings accounts), thus amplifying the effectiveness of policy-driven saving incentives. The author will conduct a heterogeneity analysis of the three financial literacy dimensions in Portugal and Hungary to investigate whether there are genuine driving factors, the extent of their influence, and provide explanations based on the actual situation.

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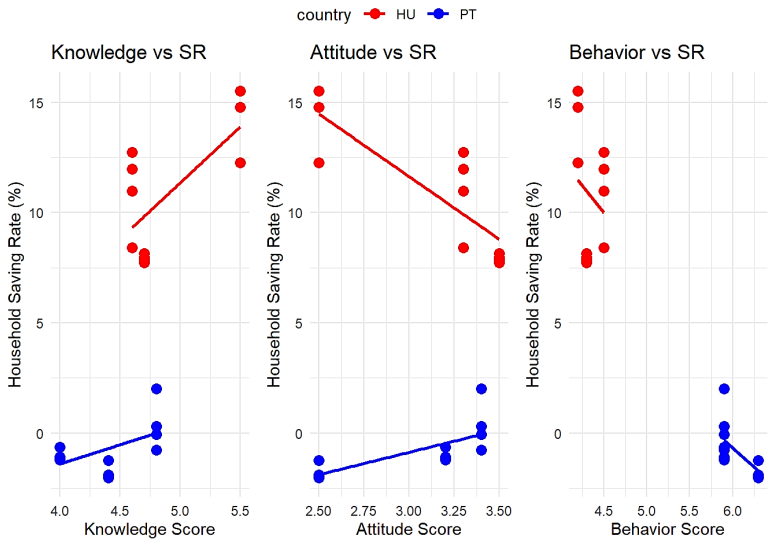

Figure 9. Scatter plots for three dimensions (knowledge, attitude, behavior)

Figure 9 shows the relation between three dimensions and Household Saving Rate. In the knowledge section, both countries present a predictable positive correlation, and could tell from the plot that Hungary's knowledge FL acts a greater factor. In the attitude section, Portugal's line remains as predicted, but Hungary's indicates that attitude, contrary to conventional wisdom, reduce the Household Saving Rate. Because in high-inflation environments, even households with strong positive attitudes towards saving may be unable to translate these intentions into action due to constraints on disposable income [11]. Also, the second pillar pension will distort the relation of attitude and real saving moves. In terms of behavior, the results far exceeded expectations, and I can explain this anomaly using the "substitution effect", which means that in countries with unstable macroeconomic conditions, such as Hungary, individuals with high financial literacy exhibit "rational behavior" by shifting from cash savings to substitute assets.

Then examine the comparison of coefficient estimates for FL Dimensions on Saving Rate, excluding the behavior score, since the author already explain its unconventional effect.

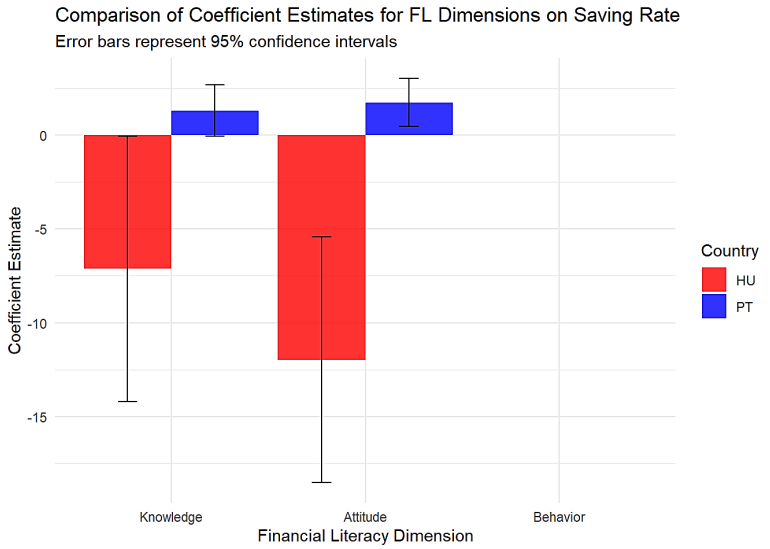

Figure 10. Comparison of coefficient estimates for FL dimensions on saving rate

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In Portugal, both financial knowledge and attitudes exhibit a stable and positive influence on the saving rate (see figure 10). The coefficient for financial knowledge is positive, indicating that a one-unit increase in the knowledge score is associated with an increase in the household saving rate of approximately percentage points. Similarly, the coefficient for financial attitude is also positive and statistically significant. The notably narrow confidence intervals around these estimates, as depicted in Figure X, indicate a high degree of precision and robustness in these findings. This suggests that in the Portuguese context, improvements in understanding financial concepts and fostering a future-oriented mindset are reliably translated into actual savings behavior. This likely reflects a supportive and stable macroeconomic environment where traditional saving incentives, such as positive real interest rates and trust in financial institutions, allow financial literacy to operate as theorized.

In stark contrast, the relationship in Hungary is characterized by considerable uncertainty and instability. While the point estimates for knowledge and attitude are also negative, their practical interpretation is severely limited by their immense statistical imprecision. The exceptionally wide confidence intervals, stretching deeply into both negative and positive territories, mean that this paper cannot be confident of the true direction or magnitude of these relationships. They are statistically indistinguishable from zero. This high level of uncertainty is not a mere statistical artifact; it is a meaningful result in itself. It strongly suggests that the connection between financial literacy and saving behavior in Hungary is weak, highly variable, or overwhelmed by other, more powerful factors. Potential explanations for this noise include extreme macroeconomic volatility (e.g., high inflation eroding the value of savings), policy shocks that distort financial decisions, or a fragmented financial landscape where the benefits of literacy are inconsistent across different segments of the population.

In conclusion, this comparative analysis demonstrates that the marginal effect of financial literacy is not universal. It is significantly amplified in a stable, supportive economic setting like Portugal, where its positive influence can be clearly observed. Conversely, in a more volatile and constrained environment like Hungary, the same literacy dimensions fail to exert a stable or predictable influence on savings, rendering their effect statistically insignificant. This underscores that the returns to financial literacy are contingent upon the institutional and macroeconomic framework in which households operate.

5. Conclusion

Based on the aforementioned research, this paper finds that financial literacy is not merely a body of knowledge but also involves behavioral motivations. Even with adequate knowledge, it is difficult to demonstrate the advantages of high financial literacy without a supportive economic environment. Secondly, the marginal benefit of financial education is constrained by the institutional context—a conclusion derived from a study on Hungary. In the absence of favorable institutional conditions, such as interest rates and debt mechanisms, financial literacy cannot be accurately assessed solely based on questionnaire scores. Therefore, different countries should develop financial education strategies tailored to their specific institutional backgrounds.

Although this study offers several contributions, it still has limitations. These include a relatively small sample size, rudimentary data imputation methods, and a lack of robustness analyses controlling for variables such as education, age, and income. Future research could extend into more granular data investigations and examine heterogeneity across a broader range of regions.

The analysis reveals a robust positive correlation in Portugal, where financial knowledge and attitudes consistently translate into higher saving rates within a stable economic environment characterized by trustworthy pension systems and supportive policy incentives. Conversely, the

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relationship in Hungary appears statistically fragile, with wide confidence intervals indicating substantial uncertainty. This divergence suggests that in contexts marked by macroeconomic volatility and historical policy instability, the behavioral manifestations of financial literacy—such as shifting portfolios toward real assets or foreign currencies—may not be captured by conventional saving rate metrics, thereby attenuating the observed correlation.

This research offers two principal contributions. Methodologically, it demonstrates the application of time-series analysis with discontinuous data to examine financial behavior dynamics, addressing a gap in the literature that has often relied on cross-sectional or panel approaches. Practically, the findings underscore the necessity for context-sensitive financial education policies. Whereas financial literacy programs may yield direct benefits in stable economies, their effectiveness in volatile environments depends critically on parallel efforts to strengthen institutional trust and address structural barriers to saving.

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