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Cognitive Barriers to Financial Inclusion: The Differential Impact of Literacy on Savings, Debt, and Investment in Chile

Francisco-Javier Lozano 

Department of Research and Public Policy, Chilean Chamber of Construction, Las Condes 7560860, Chile

ABSTRACT

This study investigates the role of financial literacy as a driver of household financial inclusion in Chile, using novel data from the 2024 Household Financial Survey (EFH). Using a probit model with multiple imputations to correct for non-random income non-response, we find that financial literacy is a strong predictor of financial behavior, exhibiting a financial sophistication gradient. Our estimates indicate that a one-point increase in the financial literacy index is associated with a 3.2 percentage point rise in access to consumer credit and a 4.5 percentage point increase in savings. This effect surges to 7.4 percentage points for investment holdings; this identifies cognitive skills as the primary filter for accessing wealth-generating assets. To address endogeneity and omitted variable bias concerns in a formal way, we implement Oster's bounds analysis and several sensitivity tests. The results yield high proportional selection coefficients, confirming that selection on unobservables would need to be significantly higher than selection on observables to invalidate our baseline estimates. Furthermore, rather than implying identical intrinsic risk preferences, our results indicate that controlling for financial human capital attenuates the gender penalty in investment and credit participation, although a gap of 5.7 percentage points persists in savings behavior. These findings support a dual policy approach: utilizing choice architecture for basic inclusion and targeted financial education policies that democratize access to complex financial markets.

Keywords: Financial Literacy; Financial Inclusion; Household Finance; Gender Gap; Cognitive Barriers

*CORRESPONDING AUTHOR:

Francisco-Javier Lozano, Department of Research and Public Policy, Chilean Chamber of Construction, Las Condes 7560860, Chile;
Email: flozano@cchc.cl

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1. Introduction

Despite the rapid expansion of financial access in emerging economies over the last two decades, a persistent puzzle remains. While access to banking services for households has become nearly universal, the effective use of financial instruments to generate wealth remains a privilege of a few. Chile is a prime example of this phenomenon. According to recent data from the Central Bank of Chile, 96% of households hold at least one financial payment product, yet financial assets represent only 7% of the total household wealth, with the vast majority of families relying exclusively on real estate and mandatory pension savings for long-term accumulation^[1]. This gap implies that the transition from passive access to active wealth management, the last mile of financial inclusion, is obstructed by cognitive barriers rather than institutional failures.

Literature on household finance has documented the correlation between financial literacy and specific behaviors, such as retirement planning or stock market participation^[2]. However, few studies have holistically analyzed household finance to determine whether the demand for cognitive sophistication varies across different types of financial decisions. Standard economic theory assumes that households act as rational agents to optimize consumption over a life-cycle^[3]. However, recent behavioral evidence suggests that the cost of thinking varies significantly, depending on product complexity^[4]. While simple products such as savings accounts or consumer credit may not require sophisticated knowledge, complex instruments impose a cognitive tax that less-literate households cannot pay. This creates a form of financial exclusion that persists even when physical access barriers are removed, a pattern recently documented across Latin America^[5].

We address this limitation by introducing the financial sophistication gradient hypothesis. Building on the distinction between basic literacy and advanced financial sophistication^[6], we argue that financial knowledge is not a generic resource with a uniform effect; rather, it acts as a tiered entry ticket. Its marginal impact is moderate for ubiquitous products such as consumer debt, in which behavioral factors like self-control may dominate, but it becomes the decisive structural barrier for complex decisions such as investment in financial instruments. Using novel data from the 2024 Household Financial Survey (EFH, Encuesta Fi-

nanciera de Hogares) and employing Multiple Imputation by Chained Equations (MICE) to correct for non-random income response, we estimate the differential probability of participation across three distinct financial domains: debt, savings, and investment.

Our results substantiate the sophistication gradient hypothesis. We find that a one-standard-deviation increase in financial literacy raises the probability of holding consumer debt by 3.2%, but increases the probability of active investment by 7.4%, an effect size more than double that of the simpler domain. This finding aligns with the global benchmark set by the OECD, which highlights that while basic financial inclusion is high, the understanding of sophisticated concepts like risk diversification remains critically low^[7]. Beyond these aggregate effects, our analysis offers a new perspective on the gender gap debate by demonstrating that the widely documented gender disparity in investment disappears entirely when financial literacy levels are controlled for. This suggests that the exclusion of women from wealth-generating markets in Chile is driven by disparities in human capital accumulation rather than intrinsic risk preferences.

Beyond these aggregate effects, our analysis offers a refined perspective on the gender gap debate. We demonstrate that the widely documented gender disparity in investment is attenuated when we control for financial literacy levels. This suggests that the exclusion of women from wealth-generating asset markets in Chile is mainly driven by structural disparities in human capital accumulation rather than by intrinsic risk preferences.

Overall, this study contributes to the household finance and behavioral economics literature in several ways. Theoretically, we move beyond binary definitions of financial access by introducing and empirically validating a financial sophistication gradient, establishing cognitive capacity as a structural filter that scales with product complexity. Methodologically, we utilize novel data (EFH 2024) and overcome standard empirical limitations in the region by combining multiple imputations (to correct for non-random income attrition) with Oster's bounds analysis^[8], thereby addressing the endogeneity and omitted variable biases often overlooked in cross-sectional household studies. From a policy perspective, we provide empirical weight to the argument that while nudges and choice architecture may suffice for simplified savings decisions, deep financial education remains

an irreplaceable prerequisite for fostering complex wealth accumulation.

The remainder of this paper is organized as follows. Section 2 describes the data and econometric strategy, detailing the construction of the financial literacy index and imputation procedure. Section 3 presents the results of the Probit models and marginal effects. Section 4 discusses the behavioral mechanisms behind the financial sophistication gradient and gender gap. Section 5 concludes the paper with policy recommendations.

2. Materials and Methods

2.1. Data Source

This study employs microdata from the 2024 Household Financial Survey (EFH), conducted by the Central Bank of Chile. The EFH is the primary source of information on the financial balance sheets of Chilean households, designed to be representative at both national and macro-zonal levels. The 2024 wave is particularly relevant, as it captures the post-pandemic financial landscape, reflecting structural adjustments in household liquidity following the withdrawal of emergency fiscal stimuli.

Previous studies have validated the reliability of self-reported data in the Chilean context. Matching EFH data with administrative banking records, Madeira and Margaretic demonstrated that while reporting discrepancies exist, they are systematic and can be mitigated by controlling for financial literacy levels, supporting the utility of the survey for behavioral analysis^[9].

The initial sample comprised 4,649 households. The survey employed a stratified two-stage random sampling design. To ensure that the results accurately represent the Chilean population, all statistical analyses in this study incorporate expansion weights provided by the Central Bank.

2.2. Measuring Financial Literacy

We measure financial literacy using the standard “Big Three” methodology^[10], chosen for its balance between brevity and ability to distinguish basic numeracy from sophisticated market knowledge. The EFH includes three standardized questions that test the following concepts:

1. Compound Interest (Numeracy): Assessing the ability

to calculate returns over time.

2. Inflation (Purchasing Power): Understanding the difference between nominal and real values.
3. Risk Diversification (Sophistication): Understanding the safety of a single asset versus a basket of assets.

We constructed a Financial Literacy Index (*FinLit*) as a summation variable ranging from 0 to 3, representing the total number of correct answers. Incorrect responses and “Do not know” responses were coded as 0, following the literature suggesting that “Do not know” reflects a genuine lack of knowledge rather than a measurement error^[11].

2.3. Dependent Variables: The Financial Sophistication Spectrum

Consistent with the conceptual framework of Re-mund^[12], and the distinction between basic literacy and advanced sophistication^[6], we operationalize household financial behavior into three distinct domains. This gradient classification is anchored in top-tier household finance literature. For instance, Campbell formalizes how the cognitive tax of financial planning scales strictly with product complexity^[3]. Similarly, van Rooij et al. establish a clear theoretical and empirical distinction between basic financial numeracy (governing debt and liquidity management) and advanced financial sophistication (functioning as a strict structural prerequisite for participating in equity and investment markets)^[13].

Building on this established hierarchy, we ordered the financial domains according to the level of cognitive sophistication required to navigate them effectively. We constructed three dichotomous variables ($Y_i = \{0,1\}$) as follows:

- Consumer debt (low sophistication). It takes the value of one if the household holds unsecured consumer debt (credit cards, store cards, or installment loans). These products are ubiquitous and defined by their ease of access and immediate gratification triggers.
- Savings (intermediate sophistication). It takes the value of one if the household reports having saved money during the last 12 months. This captures the active flow of saving rather than just the stock accumulated in specific instruments.
- Investment (high sophistication). It takes the value of one if the household holds financial assets (mu-

tual funds, stocks, bonds, or voluntary pension savings/APV). These instruments require an understanding of the risk-return trade-offs, volatility, and long-term planning.

2.4. Handling Missing Data: Multiple Imputation

A common challenge in household finance surveys is the non-response rate for sensitive variables, particularly income. In EFH 2024, approximately 27% of households failed to report the exact income figures. Excluding these observations would introduce severe selection bias, as non-response is rarely random; wealthier households and those with informal income are often less likely to report.

To address this, we employed Multiple Imputation by Chained Equations (MICE), a statistical technique that replaces missing values with multiple sets of plausible values based on correlations between observed variables^[14]. Following the methodology validated by Barceló^[15] for central bank surveys and consistent with the best practices described in Little and Rubin^[16], we generated 30 imputed datasets by using the replications provided by the Central Bank’s methodology.

The imputation model included not only the variables in the substantive analysis (financial literacy, age, education) but also auxiliary variables predictive of income (such as geographic zone, household size, and asset ownership) to satisfy the Missing at Random (MAR) assumption. This procedure allowed us to retain the full sample size, significantly increasing the statistical power and external validity of our findings compared to complete-case analysis.

2.5. Econometric Strategy

To test the financial sophistication gradient hypothesis, we estimated a series of Probit models for each of the three financial domains. The baseline specification is as follows:

$$P(Y_{ij} = 1|X_i) = \Phi(\beta_0 + \beta_1 FinLit_i + \gamma C_i + \epsilon_i)$$

Where Y_{ij} is the participation decision of household i in financial domain j (Debt, Savings, or Investment); $FinLit_i$ is the financial literacy score (0–3); C_i is a vector of control variables, including the household head’s gender, age,

educational attainment, imputed permanent income, and employment status. The selection of these covariates followed the evidence provided on the specific sociodemographic determinants of financial literacy and inclusion in Chile^[17]. Φ is the cumulative distribution function of a standard normal distribution.

Following standard academic conventions in empirical household finance, we selected covariates known to independently drive financial participation to avoid omitted variable bias. Specifically, we control for the respondent’s age to account for life-cycle accumulation and consumption patterns. We include maximum educational attainment to control for general human capital, isolating it from specific financial knowledge. Logged imputed income and employment status are included to capture strict liquidity, resource constraints, and the capacity to save or borrow. Finally, we control for gender, homeownership, household size, and immigrant status to account for structural household wealth and potential supply-side exclusion. The comprehensive inclusion of these covariates ensures that our financial literacy coefficient isolates cognitive effects rather than acting as a proxy for broader socioeconomic advantages, aligning with established empirical frameworks for Chile^[17].

We report Average Marginal Effects (AME) rather than raw coefficients to allow for direct interpretation of the magnitude of the impact of financial literacy on the probability of participation. Standard errors were clustered at the primary sampling unit level to account for the complex survey design.

While our multivariate Probit models control for a comprehensive set of observable covariates, we acknowledge the potential endogeneity inherent in estimating the returns to financial literacy using cross-sectional data. Specifically, our baseline estimates may be subject to omitted variable bias (e.g., unobserved innate cognitive ability, parental background, or time preferences) and reverse causality (e.g., active market participation incentivizing the acquisition of financial knowledge). To address these endogeneity concerns and test the stability of our coefficients in a formal way, we complement our baseline specification with a bounds analysis for selection on unobservables, following the methodology proposed by Oster^[8]. This approach allows us to calculate the degree of selection on unobserved factors required to drive the financial literacy effect to zero, providing a robust empirical test for the sophistication gradient.

3. Results

3.1. Descriptive Evidence

Table 1 presents descriptive statistics for the weighted sample, providing a snapshot of the financial landscape of Chilean households. The data reveal distinct patterns of financial participation that align with the level of sophistication required by instruments. While 35% of households hold consumer debt and 34% accumulate savings during the previous year, only 29% participate in financial investments, suggesting that barriers to entry increase as financial products become more sophisticated.

Regarding human capital, **Figure 1** displays the dis-

tribution of financial literacy, revealing two key findings. **Figure 1a** shows that knowledge is unevenly distributed, with a clear skew towards lower scores. Only 18% of the households answered all three standardized questions correctly, indicating that a full understanding of financial mechanisms is limited to a small elite. **Figure 1b** breaks down these components, revealing a critical V-shaped cognitive pattern. While the understanding of interest and risk diversification is relatively high (62% and 64% respectively), there is a widespread inability to calculate real returns adjusted for inflation (39%). This specific deficit suggests the prevalence of money illusion, in which households fail to distinguish between nominal and real values, a critical skill for long-term wealth accumulation.

Table 1. Descriptive Statistics of the Sample.

Variable	Definition	Mean	Std. Dev.	Min.	Max.
Financial Behaviors (Y)					
Consumer Debt	=1 if holds consumer debt	0.35	0.48	0	1
Savings	=1 if saved during the last year	0.34	0.47	0	1
Financial Assets	=1 if holds financial assets	0.29	0.45	0	1
Financial Knowledge (X)					
FinLit Index	Total correct answers (0–3)	1.65	0.91	0	3
Control Variables (C)					
Female	=1 if respondent is female	0.61	0.49	0	1
Age	Age of respondent (years)	48.7	16.1	18	94
Higher Education	=1 if max education is Tertiary	0.37	0.48	0	1
Retired	=1 if retired	0.21	0.41	0	1
Immigrant	=1 if born outside Chile	0.07	0.25	0	1
Homeowner	=1 if owns home	0.52	0.50	0	1
Household Size	Number of members	2.66	1.45	1	12
Income (Log)	Log of monthly income	13.60	2.50	0	18.94

Note: Sample size = 4,649. Statistics are weighted using expansion factors provided by the Central Bank of Chile to represent the national population. Income variables reflect the average across 30 multiple imputation datasets (MICE). Binary variables (0/1) are reported as proportions. Source: Author’s calculations based on the 2024 Household Financial Survey (EFH).

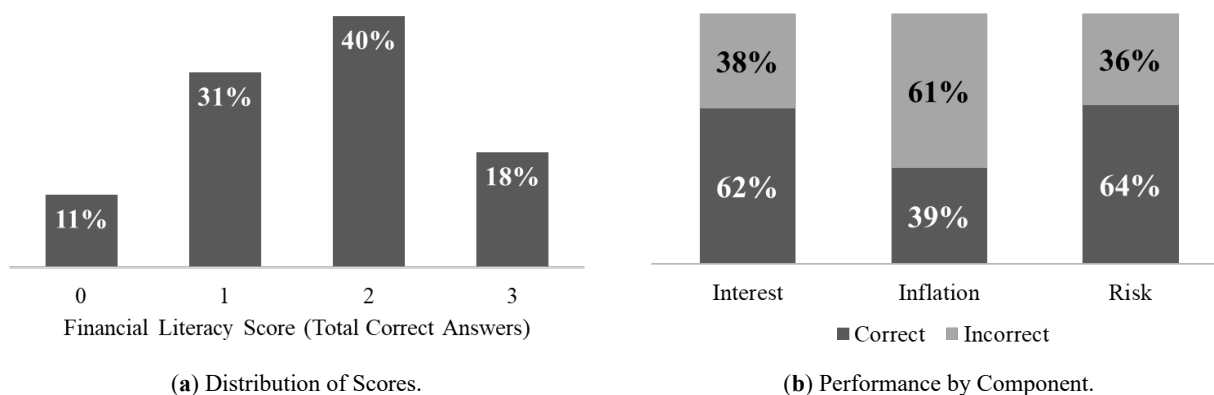


Figure 1. Financial Literacy in Chile: Distribution and Components.

Note: Statistics are weighted using expansion factors to represent the national population. Panel (a) displays the distribution of the aggregate Financial Literacy Index (0 to 3 correct answers). Panel (b) reports the percentage of correct responses for each component of the “Big Three” questions. Source: Author’s calculations using microdata from the 2024 Household Financial Survey (EFH), Central Bank of Chile.

3.2. Econometric Results

Following the descriptive analysis, we estimate the marginal impact of financial literacy on financial behavior using Probit models with multiple imputation (MICE) to correct for missing income data. **Table 2** reports the Average Marginal Effects (AME) for the three financial domains.

Supporting the financial sophistication gradient hypothesis, we observed a monotonic increase in the financial lit-

eracy coefficient as the decision became more complex. As **Figure 2** shows, a one-unit increase in the Financial Literacy Index is associated with a 3.2 percentage point increase in the probability of holding consumer debt (Column 1). This effect rises to 4.5 percentage points for formal savings (Column 2) and nearly doubles to 7.4 percentage points for investment in financial assets (Column 3). All estimates are statistically significant at the 1% level.

Table 2. Average Marginal Effects of Financial Literacy on Financial Behaviors (Probit Models).

Variables	(1) Consumer Debt	(2) Savings	(3) Investment
Financial Literacy Index	0.032*** (0.012)	0.045*** (0.011)	0.074*** (0.011)
Female	-0.003 (0.024)	-0.056** (0.022)	-0.001 (0.019)
Age	0.000 (0.001)	-0.004*** (0.001)	-0.001 (0.001)
Education: Tertiary	0.093*** (0.024)	0.162*** (0.021)	0.148*** (0.021)
Income (Log)	0.025** (0.010)	0.022*** (0.008)	0.048*** (0.011)
Retired	-0.118*** (0.037)	0.003 (0.032)	0.031 (0.030)
Immigrant	-0.100** (0.050)	0.047 (0.045)	-0.095* (0.051)
Homeowner	-0.017 (0.023)	0.078*** (0.022)	0.015 (0.020)
Household size	0.028*** (0.007)	-0.017** (0.007)	0.004 (0.006)
Constant	Yes	Yes	Yes
Observations	4,649	4,649	4,649
Pseudo R ²	0.052	0.089	0.107

Note: Estimates are based on 30 multiple imputation datasets (MICE) to correct for missing income data. Robust standard errors clustered at the primary sampling unit level are reported in parentheses. The dependent variables are binary indicators for holding consumer debt, formal savings, and financial assets. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Author's calculations based on EFH 2024.

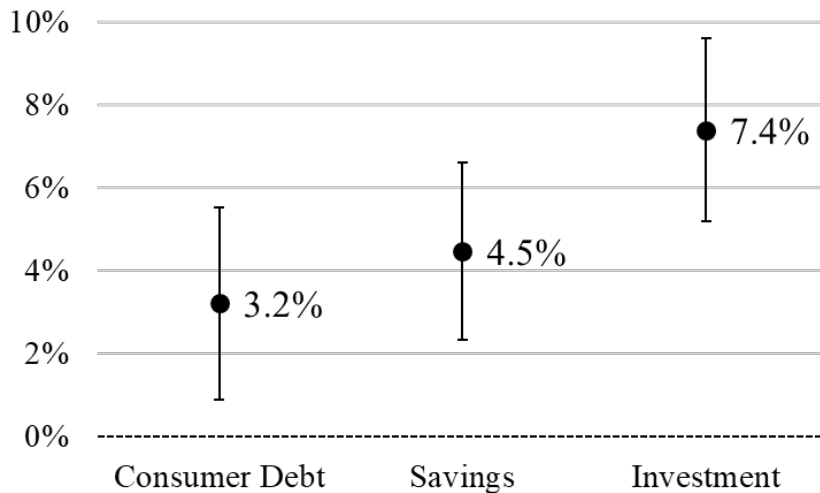


Figure 2. Marginal Returns to Financial Literacy.

Note: The figure displays the Average Marginal Effects (AME) of a one-unit increase in the Financial Literacy Index on the probability of participating in each financial domain. Dots represent point estimates derived from Probit models using multiple imputation (MICE); vertical lines represent 95% confidence intervals.

To put this magnitude into perspective, moving from a financial literacy score of 0 (no correct answers) to 3 (full score) is associated with an approximate 22 percentage point increase in the probability of holding financial assets, *ceteris paribus*. This substantial shift underscores that financial literacy is a primary driver of portfolio diversification.

Moreover, these results indicate that while cognitive skills matter for all financial decisions, they are the decisive gatekeepers for high-sophistication instruments. The increase in the model's explanatory power (Pseudo R-squared) from 0.052 in the debt model to 0.107 in the investment model underscores this pattern: financial literacy and socioeconomic controls explain the decision to invest far better than they explain the decision to borrow, which may be influenced more by supply-side constraints or unobserved shocks.

Beyond the cognitive dimension, our results reveal persistent structural barriers to entry. Tertiary education emerges as the single largest predictor across all financial behaviors, surpassing financial literacy in magnitude, which underscores the dominant role of general human capital accumulation. Additionally, we identify severe friction among vulnerable groups: immigrants exhibit a lower probability of holding formal consumer debt and financial assets. In the Chilean context, this significant negative coefficient is interpreted as evidence of financial exclusion, likely driven by supply-side credit rationing due to a lack of credit history, rather than a lower demand for liquidity.

3.3. Comparative Empirical Evidence

Our findings on returns to sophistication align closely with recent empirical evidence. Specifically, the 7.4% marginal effect of financial literacy on investment in financial instruments matches the established baseline^[13], confirming that financial knowledge remains the primary engine for stock market participation. Furthermore, recent evidence supports this mechanism, suggesting that the link between literacy and market participation is also a proxy for broader financial resilience in volatile environments^[18].

Regarding the debt domain, our lower estimated effect (3.2%) offers a more nuanced perspective. This modest impact is consistent with Madeira^[19], who argued that in the Chilean market, risk sorting by supply-side institutions effectively screens households, dampening the marginal role of demand-side literacy. Moreover, Wang et al. (2025) re-

fine this interpretation, suggesting that financial literacy may not simply reduce the probability of holding debt, but rather restructure it through financial attention, shifting households away from toxic instruments, even if total participation remains stable^[20]. Finally, in terms of wealth accumulation, our results align with the digital nexus identified by Wang and Zhang^[21], implying that the high returns on literacy observed in our investment model are likely amplified by the complementarity between cognitive skills and digital financial infrastructure.

3.4. Deconstructing the Gender Gap

Our multivariate analysis also clarifies the structural nature of the gender gap in terms of financial inclusion. A key finding from **Table 2** is the behavior of the *Female* coefficient. Once we control for financial literacy and other socioeconomic factors, the gender variable becomes statistically insignificant for both consumer debt and financial assets.

While this statistical attenuation does not definitively rule out unobserved differences in intrinsic risk preferences, it indicates that the raw gender gap is largely driven by historical disparities in human capital and financial knowledge. When women possess the same level of financial literacy as men, their likelihood of participating in stock markets or credit markets converges. However, a significant negative penalty persists for formal savings (−5.6 percentage points). This suggests that distinct intra-household bargaining power, caregiving burdens, or structural income constraints limit women's capacity to accumulate liquid savings independently of their cognitive capabilities.

3.5. Robustness: Addressing Endogeneity and Selection on Unobservables

An important challenge in estimating the returns to financial literacy using cross-sectional data is endogeneity, specifically reverse causality and omitted variable bias. While Instrumental Variable (IV) strategies are the standard approach to address these issues, the public EFH 2024 dataset presents structural limitations. To preserve statistical anonymity, the Central Bank aggregates all geographical identifiers into vast macrozones. Our extensive testing revealed that this extreme aggregation destroys the granular

spatial and local-network variance required for a strong first-stage instrument, systematically leading to weak-instrument bias (F-statistics strictly below the standard thresholds).

Therefore, to address concerns regarding endogeneity and omitted variable bias inherent to cross-sectional survey data, without introducing finite-sample bias from weak instruments, we implemented the bounds analysis proposed by Oster^[8]. We estimated linear probability models (LPM) to calculate the proportional selection coefficient (delta) required for unobserved factors to drive the financial literacy effect to zero.

Under the conservative assumption ($R_{max} = 1.3 \times R^2$), the delta values yielded 3.16 for the investment model, 2.98 for consumer debt, and 2.36 for savings. Because all values strictly satisfy the threshold of $\delta > 1$, our estimates are robust. Unobserved factors (e.g., innate cognitive ability, parental background, or time preferences) would need to be nearly three times as influential as the current set of

observables, which includes income and tertiary education, to invalidate the results. Furthermore, the fact that delta is strictly highest for the investment domain provides a robust, independent empirical validation for the sophistication gradient hypothesis.

Finally, we conducted a battery of sensitivity tests to ensure our baseline estimates were not driven by extreme outliers or variable construction (**Table 3**). Re-estimating the models excluding the top and bottom 1% and 5% of the income distribution yielded structurally consistent results. Furthermore, replacing the additive financial literacy index with alternative measures (a binary indicator for perfect financial literacy and a decomposition of the three individual questions) fully preserved the sophistication gradient. In addition, understanding risk diversification emerged as a highly significant predictor for investment but was statistically insignificant for consumer debt, providing empirical support for the tiered cognitive barriers hypothesized in this study.

Table 3. Results of Sensitivity Tests (Average Marginal Effects).

Variable Specification	(1) Consumer Debt	(2) Savings	(3) Investment
Baseline: Financial Literacy Index	0.032*** (0.012)	0.045*** (0.011)	0.074*** (0.011)
Subsample: Excluding 1% Income Tails	0.025** (0.012)	0.035*** (0.011)	0.065*** (0.011)
Subsample: Excluding 5% Income Tails	0.024* (0.013)	0.033*** (0.012)	0.064*** (0.012)
Alternative Measure: Perfect FinLit (Dummy)	0.054** (0.023)	0.069*** (0.025)	0.136*** (0.022)
Decomposed FinLit Components:			
Q1: Interest (Numeracy)	0.093*** (0.024)	0.078*** (0.023)	0.080*** (0.021)
Q2: Inflation (Purchasing Power)	-0.013 (0.022)	0.007 (0.021)	0.033* (0.019)
Q3: Risk (Diversification)	0.015 (0.024)	0.048** (0.023)	0.109*** (0.020)

Note: The table reports Average Marginal Effects (AME) from alternative Probit specifications to test the sensitivity of the baseline results. Each of the first four rows reports the estimated marginal effect of the financial literacy variable from separate, independent regressions. The final three rows report the coefficients from a single model where the additive index is decomposed into its individual dummy components. All models include the full set of controls utilized in the baseline specification. Estimates are based on 30 multiple imputation datasets (MICE). Robust standard errors clustered at the primary sampling unit level are reported in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Author’s calculations based on EFH 2024.

4. Discussion

4.1. Behavioral Interpretation: Ambiguity Aversion and Cognitive Costs

Our empirical findings substantiate the existence of a financial sophistication gradient. The finding that the marginal effect of financial literacy on investment (7.4%) is more than double its effect on debt (3.2%) suggests that the returns to

financial knowledge are not linear but increase with asset complexity.

Building on the distinction established between basic literacy and advanced financial sophistication^[6], our data indicate that while basic numeracy may suffice for simpler products, advanced sophistication is a structural prerequisite for wealth accumulation.

While our cross-sectional data limits our ability to ob-

serve psychological states directly, drawing from established behavioral literature, this empirical phenomenon is best interpreted through the lens of ambiguity aversion^[3]. For a household with low financial human capital, the stock market is not an intertemporal optimization tool, but a radical uncertainty environment. Without the capacity to process information regarding expected returns and volatility, participation is perceived as ambiguous. Financial literacy acts by reducing the cognitive cost of entry, transforming ambiguity (unknown probabilities) into risk (known probability distributions), enabling rational participation.

The prevalence of the money illusion (**Figure 1**) reinforces this mechanism. The widespread inability to calculate real returns (only 39% correct responses regarding inflation) implies that households lack a fundamental tool to evaluate the equity risk premium against the nominal safety of deposits, perpetuating their exclusion from long-term wealth growth.

4.2. Mechanisms of the Gradient

Recent literature helps explain why financial literacy acts as a decisive gatekeeper for investment but appears less dominant for debt management.

First, regarding the high barrier to investment, the intrinsic complexity of investment products creates a structural barrier that can only be surmounted by investors with specific technical knowledge, thereby generating market segmentation^[22]. This sophistication is required to understand diversification, not just locally but also internationally: global diversification is identified as a distinct signal of financial sophistication that is unreachable for the average investor^[23]. Our empirical decomposition (**Table 3**) substantiates this theoretical channel: understanding risk diversification (Q3) acts as a significant predictor for investment, confirming that specific technical knowledge is required to cross this barrier. Trust also plays a crucial role in this process. The lack of knowledge generates distrust in the financial system; households do not invest in assets they do not understand because of the fear of fraud^[24]. However, Darwish nuanced this relationship, noting that while a baseline of knowledge is necessary to trust, overconfidence in investors with only intermediate knowledge can lead to suboptimal decisions^[25].

Second, regarding the lower magnitude of the effect on consumer debt (3.2%), the seminal work by Gathergood of-

fers a compelling explanation: while investment is a problem of cognitive skill (calculating returns), excessive indebtedness is fundamentally a problem of self-control and impatience^[26]. Our empirical data align with this distinction: while basic numeracy (Q1) predicts debt participation, advanced risk sophistication (Q3) has no statistically significant effect on holding consumer debt (**Table 3**). Therefore, financial literacy has limited explanatory power over consumer debt, where the behavioral biases of immediate gratification predominate. The literature also suggests that these behaviors have deep roots in childhood development, indicating that informational interventions in adulthood are limited if they do not address personality traits formed early in life^[27].

4.3. Investment and Gender: Knowledge vs. Preferences

One policy-relevant finding of this study is the behavior of the gender variable in our multivariate models. Historically, lower female participation in financial markets has often been attributed to women's intrinsic risk aversion. However, our results indicate that disparities in financial knowledge capture a substantial portion of the variance in market participation previously attributed to gender. Once we control for financial literacy and general human capital, the gender penalty in both investment and consumer debt is attenuated.

While the statistical insignificance of the female dummy does not mathematically rule out the existence of unobserved differences in intrinsic risk preferences, it suggests that cognitive barriers play a mediating role. In line with Almenberg and Dreber, this implies that the observed raw gap in financial participation is heavily compounded by women's lower historical exposure to financial and mathematical education^[28]. Women may not necessarily avoid financial markets due to risk aversion; rather, they may be rationally avoiding the ambiguity derived from a lack of specific financial sophistication.

This evidence for Chile is consistent with the global context^[11] and corroborates local findings^[29], which demonstrate that gender gaps in financial inclusion vanish when controlling for observable human capital factors. This has immediate policy implications: strategies to close the gender gap should not focus on convincing women to take more risks, but on closing the structural gap in mathematical and

financial knowledge.

4.4. The Role of Information and Choice Architecture

Given that accumulating the financial sophistication described in Lusardi et al.^[6] is a slow and costly process, public policy cannot rely exclusively on long-term school-based education. As suggested by previous research, there is a complementary need for choice architecture^[30,31].

For households with low financial literacy, who are currently excluded from investment or trapped in costly debt, regulations must promote nudges and simplified information disclosure (e.g., clear risk labels, default options). These mechanisms act as temporary substitutes for financial sophistication, protecting household welfare, while the necessary long-term cognitive capabilities are built to navigate an increasingly complex financial system.

5. Conclusions

We demonstrate that financial literacy functions as a structural filter of economic inequality in Chile. Our analysis of the financial sophistication gradient reveals that cognitive barriers do not equally affect all financial decisions. While basic access to consumer debt is relatively insensitive to financial knowledge (marginal effect of 3.2%), participation in wealth-generating investment instruments is heavily dependent on it (marginal effect of 7.4%).

Without financial sophistication, households are relegated to the shallow end of the financial system, managing liquidity through costly debt, while remaining systematically excluded from the capital markets required for real wealth accumulation. This cognitive divide explains why, despite near-universal access to banking products, the concentration of financial assets remains relatively high. Our analysis also reveals that the gender gap in investment is not a matter of preference, but of unequal access to this specific form of human capital; when women acquire financial sophistication, they participate in markets at the same rate as men.

The existence of a sophistication gradient implies that a one-size-fits-all approach to financial inclusion would be inefficient. We propose a dual policy strategy that matches the intervention to the complexity of the decision.

The first is nudges for basic financial security. For

low-complexity decisions such as savings accumulation or debt management, relying solely on education is inefficient. Instead, policies should leverage choice architecture. As demonstrated by Thaler and Benartzi, automatic enrollment mechanisms (like the “Save More Tomorrow” program) successfully overcome behavioral inertia without requiring deep cognitive changes^[32]. Local evidence corroborates the effectiveness of this approach in the Chilean pension system, where simplified information structures significantly improved provider selection^[31]. Therefore, regulatory efforts should focus on simplifying the choice architecture for credit and basic savings products to protect households from behavioral biases.

Second, there is deep education for wealth creation. Nudges are insufficient for high-complexity investment decisions. The barrier here is cognitive and not behavioral. As warned by Fuentes et al., the positive short-term effects of personalized information can dissipate quickly if not supported by structural knowledge^[30]. This reinforces the need for deep, substantive financial education. However, to avoid the decay of knowledge noted by skeptics, we align with recommendations in Fernandes et al., suggesting just-in-time financial education interventions delivered at critical decision moments (e.g., entering the workforce, receiving a bonus) rather than generic classroom instruction^[33].

Finally, an economic case for public investment in this area is compelling. As shown by Behrman et al.^[34], using Chilean data, when endogeneity is strictly controlled, financial literacy has a causal and substantial impact on wealth accumulation. Therefore, treating financial education as a pillar of social policy, rather than a consumer protection add-on, is essential for fostering long-term financial resilience.

The primary limitation of this study is its reliance on cross-sectional data from the EFH 2024. While we employ multiple imputations to mitigate selection bias regarding income and control for a wide range of observable socioeconomic factors, we cannot strictly claim temporal causality. We acknowledge potential sources of endogeneity, particularly reverse causality (active market participation might intrinsically increase financial literacy) and omitted variable bias (unobserved future orientation or parental background). Future research should prioritize identifying causal mechanisms using panel data to track household trajectories. Subsequent studies would benefit from using Instrumental Vari-

able (IV) strategies, such as exposure to historic educational reforms or geographic proximity to financial institutions during childhood, to isolate the exogenous variation in financial literacy and definitively validate the magnitude of the sophistication gradient. Further experimental evidence is needed to disentangle the specific mechanisms of the trust channel in the Chilean stock market.

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Institutional Review Board Statement

Not applicable. This study relies on secondary analysis of anonymized microdata from the Central Bank of Chile and does not involve primary data collection from human participants or animals.

Informed Consent Statement

Not applicable.

Data Availability Statement

The datasets generated and/or analyzed during the study are available in public repositories. Current and historical EFH datasets can be obtained from the Central Bank of Chile website.

Conflicts of Interest

The author is employed by the Chilean Chamber of Construction (CChC). However, this research was conducted independently as an academic contribution. The views and opinions expressed in this paper are those of the author and do not necessarily reflect the official policy, position, or endorsement of the Chilean Chamber of Construction. The author has no relevant financial or non-financial interests to disclose beyond this professional affiliation. The author declares that AI-based tools were utilized for language and grammar polishing and structural refinement to improve readability. The theoretical framework, empirical analysis, and

conclusions remain the author's original work.

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