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Retirement Readiness in the Baltics: The Roles of Financial Literacy, Product Ownership, and Advisory Confidence

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Abstract: This study examined the relationships between financial literacy, financial product ownership, confidence in financial advisers, and confidence in retirement readiness across Estonia, Latvia, and Lithuania. By using data from the Flash Eurobarometer 525 survey (March 2022) and applying categorical data analysis methods, including chi-square tests and Cramér's V, the findings revealed that a higher financial literacy and confidence in financial advisers are significantly associated with greater retirement preparedness. The ownership of financial products, particularly among active investors, is also strongly correlated with improved retirement outcomes. These results highlight the importance of financial education, accessible advisory services, and policies promoting financial literacy and product ownership to mitigate retirement risks and enhance financial security in the Baltic region.

Keywords: financial literacy; retirement readiness; financial product ownership; Baltic countries; categorical data analysis; financial education; retirement planning

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1. Introduction

Retirement readiness is a growing concern as individuals face uncertainties surrounding their financial security in later life. In the Baltic countries—Estonia, Latvia, and Lithuania—this issue is particularly pressing due to demographic shifts, such as aging populations, and economic transitions, including evolving pension systems and financial markets. Understanding the factors influencing retirement preparedness is crucial for mitigating the risks associated with inadequate financial planning, particularly in a region with varying levels of financial literacy and access to financial products.

The aging population and economic volatility in the Baltics highlight the importance of financial literacy as a tool for managing long-term financial risks. Numerous studies have established that higher levels of financial literacy are associated with improved financial decision making, wealth accumulation, and retirement planning. For example, Chen and Chen (2023) provided evidence that financial literacy confidence significantly impacts retirement preparedness. Similarly, Ricci and Caratelli (2017) emphasized the role of trust in financial literacy when it comes to planning for retirement. However, in the Baltic context, disparities in financial literacy, as reported by Klapper et al. (2013), pose unique challenges that require targeted interventions.

Beyond financial literacy, the ownership of financial products, such as private pensions, investment accounts, and insurance policies, has been shown to play a pivotal role in retirement readiness. Mustafa et al. (2025) highlighted how financial literacy, along with health literacy and financial advisors, contributes to effective retirement planning. Harahap

et al. (2022) further suggested that saving behavior and financial risk tolerance serve as mediators, emphasizing that financial literacy alone may not be sufficient without access to appropriate financial products and services. While the existing literature underscores the importance of financial literacy and product ownership, limited research has explored their combined effect on retirement readiness, particularly in the Baltic region. This study sought to address these gaps by examining the interplay between financial literacy, financial product ownership, and confidence in retirement readiness in Estonia, Latvia, and Lithuania. Additionally, it introduces the role of confidence in financial advisers as a potential mediator in retirement planning, reflecting the critical importance of trust and guidance in financial decision making.

This study contributes to the literature in three key ways. First, it provides empirical evidence from the Baltic countries, a region often overlooked in global studies on financial literacy and retirement readiness. Second, by examining the combined influence of financial literacy, product ownership, and confidence in financial advisers, it offers a comprehensive perspective on the factors shaping retirement preparedness. Third, the findings emphasize the need for policies that integrate financial education with efforts to expand access to financial products and advisory services, aligning with the focus on financial risk management and mitigation.

By using data from the Flash Eurobarometer 525 survey, this study analyzed the responses of 3071 adults in Estonia, Latvia, and Lithuania collected in March 2022. By employing categorical data analysis methods, including chi-square tests and measures of association such as Cramér's V, it explored the relationships among financial literacy, financial product ownership, and retirement readiness.

This research has significant implications for policymakers, financial institutions, and academics. Policymakers can use the findings to develop targeted financial education programs and initiatives that improve access to financial products. Financial institutions may benefit from insights into how to enhance trust and engagement with financial advisors. Finally, this study enriches the academic discourse by providing empirical evidence on retirement readiness in the under-researched Baltic context.

2. Literature Review and Hypothesis Development

2.1. Financial Literacy and Retirement Readiness

Financial literacy, defined as the ability to understand and effectively use various financial skills, including personal financial management, budgeting, and investing, is essential for sound financial decision making (Shaikh and Khan 2025). Extensive research highlights the positive relationship between financial literacy and retirement readiness. For instance, Lusardi and Mitchell (2011) demonstrated that individuals with a higher financial literacy are more likely to plan for retirement, accumulate savings, and exhibit financial behaviors conducive to long-term security. Similarly, van Rooij et al. (2011) found that financial literacy not only promotes better retirement outcomes, but also facilitates the understanding of complex financial products, thus empowering individuals to make optimal financial decisions.

Recent studies have continued to emphasize the critical role of financial literacy in retirement planning. Yakoboski et al. (2023) introduced the concept of "longevity literacy", which underscores the importance of understanding life expectancy in retirement preparation. Their findings revealed that individuals with a higher financial literacy exhibit greater confidence in their ability to manage retirement risks, such as inflation and healthcare costs. Chen and Chen (2023) further validated these observations in the Chinese context, demonstrating that financial literacy confidence directly influences retirement preparedness by reducing financial anxiety and encouraging proactive planning behaviors.

In addition to its direct impact, financial literacy addresses behavioral barriers to effective retirement planning. Thaler and Benartzi (2004) argued that behavioral constraints, such as procrastination, inertia, and loss aversion, can undermine financial decision making. These constraints often result in suboptimal savings and investment behaviors, even among financially literate individuals. However, financial education programs designed to address these behavioral tendencies, such as default enrollment in retirement plans and targeted nudges, have shown promise in improving retirement outcomes (Harahap et al. 2022).

Financial literacy also interacts with socio-demographic factors to shape retirement readiness. For example, Yakoboski (2024) highlighted significant disparities in financial literacy levels based on gender, age, and income, which, in turn, affect retirement-planning behaviors. Women, in particular, often report lower financial literacy levels, leading to reduced retirement confidence and preparedness. These disparities underscore the need for targeted interventions to enhance the financial literacy among vulnerable populations.

While the literature establishes a strong link between financial literacy and retirement readiness, it also highlights the limitations of relying solely on financial knowledge. Behavioral factors and systemic barriers, such as access to financial products and advisory services, play a significant role in determining retirement outcomes (Knoll 2011). As a result, integrating financial education with broader financial inclusion strategies is essential for achieving comprehensive improvements in retirement readiness. Therefore, we hypothesized the following:

Hypothesis 1 (H1). *Higher levels of financial literacy are positively associated with greater confidence in retirement readiness in the Baltic states.*

2.2. Financial Product Ownership and Retirement Readiness

The ownership of financial products, such as private pensions, investment accounts, and life insurance, is a critical factor in retirement readiness. Financial products serve as structured vehicles for saving and investing, enabling individuals to accumulate wealth and manage risks over the long term. By providing access to diversified financial instruments, these products reduce uncertainty and enhance financial security in retirement (Beckmann 2013).

Research has underscored the importance of financial product ownership in retirement planning. Dundure and Sloka (2021) emphasized that younger individuals in Latvia who engage with financial products exhibit stronger retirement preparedness due to early financial engagement. Financial products, particularly those designed for long-term savings, create mechanisms for consistent wealth accumulation and provide a safety net against economic volatility. Ingale and Paluri (2023) conducted a systematic review of 191 studies on retirement planning, revealing that the ownership of financial products amplifies the positive effects of financial literacy on retirement outcomes.

The interplay between financial literacy and financial product ownership further highlights its importance. Ganguly and Prakash (2023) demonstrated that the ownership of investment products fosters proactive financial behaviors, which are crucial for mitigating retirement risks. Financial product ownership reinforces retirement readiness by enabling systematic savings and creating pathways for risk diversification.

The barriers to financial product ownership, however, remain significant, particularly in regions with uneven access to financial services. Klapper et al. (2013) highlighted disparities in financial inclusion across income and geographic lines, with low-income households and those in rural areas often lacking access to affordable financial products. These barriers can exacerbate inequalities in retirement readiness, as individuals without access to structured financial instruments are more vulnerable to financial insecurity later in life. Policies aimed at promoting financial inclusion, such as subsidies for private pensions

or tax incentives for long-term investments, have shown potential in addressing these disparities (Hira et al. 2009).

The role of trust in financial institutions and advisors is another critical factor influencing financial product ownership. Ricci and Caratelli (2017) demonstrated that trust significantly enhances individuals' willingness to engage with financial products, particularly in settings where financial literacy levels are moderate. Without trust, even financially literate individuals may hesitate to invest in complex financial products, limiting their retirement preparedness.

The evidence from various studies converges on the conclusion that financial product ownership is indispensable for retirement readiness. It not only provides the necessary tools for wealth accumulation, but also bridges the gap between financial knowledge and practical financial behaviors. However, maximizing the benefits of financial product ownership requires integrated strategies that address financial literacy, behavioral barriers, and systemic obstacles to access.

Hypothesis 2 (H2). *There is a significant association between financial product ownership and retirement readiness.*

2.3. Combined Effect of Financial Literacy and Financial Product Ownership on Retirement Readiness

While financial literacy and financial product ownership independently contribute to retirement readiness, their combined effect offers a more nuanced understanding of the factors influencing financial security later in life. Financial literacy provides individuals with the knowledge and confidence needed to make informed decisions, while financial products offer the necessary tools to translate this knowledge into actionable behaviors (Hastings et al. 2012). Together, these elements form a comprehensive framework for addressing retirement preparedness.

Research has highlighted the synergy between financial literacy and financial product ownership in enhancing retirement outcomes. For example, Yakoboski et al. (2023) noted that individuals who integrate financial knowledge with active engagement in financial products tend to exhibit higher levels of financial preparedness. This finding underscores the importance of integrating financial education with strategies that promote financial inclusion and access to diverse financial tools. By aligning financial knowledge with practical applications, individuals are better equipped to manage retirement risks, such as inflation and healthcare costs.

The role of financial advisors as mediators in this relationship further strengthens its significance. Demir and Kara (2023) emphasized that trust in financial advisors not only facilitates engagement with financial products, but also enhances the application of financial literacy in decision making. Similarly, Sundarasen et al. (2024) argued that financial advisors bridge the gap between financial literacy and product ownership by providing tailored guidance, particularly for individuals with limited prior experience in financial planning.

In the Baltic context, disparities in financial literacy and access to financial products pose unique challenges (European Commission 2023). Rupeika-Apoga and Wendt (2022) argued that improving financial literacy without addressing systemic barriers, such as limited access to affordable financial products, may lead to suboptimal outcomes. Conversely, promoting financial product ownership without enhancing financial literacy could result in the underutilization or misuse of financial tools. Therefore, policies that integrate these two elements—through financial education programs, advisory services, and initiatives to expand product accessibility—are crucial for improving retirement readiness in the region.

Behavioral finance theories further support the combined effect of financial literacy and product ownership. Procrastination, inertia, and loss aversion, as highlighted by Thaler and Benartzi (2004), often impede individuals from taking proactive steps toward retirement planning. However, financial products designed with behavioral considerations, such as automated savings plans or default enrollment in retirement accounts, can mitigate these barriers. When paired with financial literacy, these tools empower individuals to make more informed and consistent financial decisions (Mustafa et al. 2025).

Overall, the integration of financial literacy and financial product ownership represents a holistic approach to retirement readiness. This dual emphasis addresses both the knowledge and practical components necessary for effective financial planning, ensuring that individuals are better prepared to achieve financial security later in life. Therefore, we hypothesized the following:

Hypothesis 3 (H3). *The association between financial literacy and retirement readiness differs significantly among Estonia, Latvia, and Lithuania.*

3. Results

3.1. Descriptive Statistics

Table 1 summarizes the mean and median financial literacy (FL) and retirement readiness (RR) scores for Estonia, Latvia, and Lithuania.

Table 1. Descriptive statistics for financial literacy (FL) and retirement readiness (RR).

Country	Mean FL	Median FL	Mean RR	Median RR	Sample
Estonia	2.99	3	2.06	2	1029
Latvia	2.40	2	1.98	2	1018
Lithuania	2.55	3	2.06	2	1024

Figures 1 and 2 display density plots illustrating the distributions of the FL and RR scores across the three countries. Estonia exhibited the highest mean FL score, while Latvia showed the lowest confidence in RR.

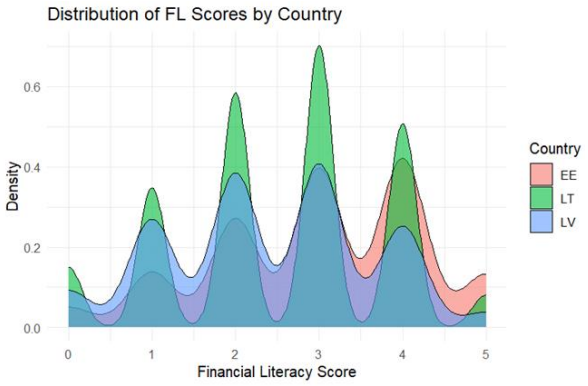

Figure 1. Distribution of financial literacy (FL) scores across countries.

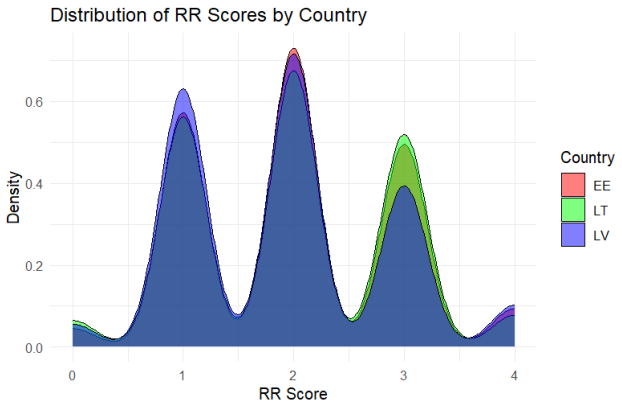

Figure 2. Distribution of retirement readiness (RR) scores across countries.

3.2. Comparative Analyses

Before conducting comparative analyses, normality tests were performed to determine whether the financial literacy (FL) and retirement readiness (RR) scores followed a normal distribution. The Shapiro–Wilk test results indicated significant deviations from normality for the FL scores in all three countries ($p < 0.05$), as shown in Table 2. Given these findings and the ordinal nature of the variables, non-parametric methods were employed for the subsequent analyses.

Table 2. Shapiro–Wilk test results for normality (financial literacy).

Country	W-Statistic	*p*-Value	Normal Distribution?
Estonia	0.923	<0.001	No
Latvia	0.879	<0.001	No
Lithuania	0.901	<0.001	No

The results of the Kruskal–Wallis test, presented in Table 3, indicated significant differences in the FL scores among Estonia, Latvia, and Lithuania.

Table 3. Kruskal–Wallis test results for financial literacy.

Test	Variable	Chi-Square	df	*p*-Value
Kruskal–Wallis	FL	122.66	2	<0.001

Post hoc pairwise comparisons using the Wilcoxon rank-sum test, adjusted with the Bonferroni correction, are provided in Table 4.

Table 4. Post hoc pairwise comparisons for financial literacy (Wilcoxon rank-sum test).

Comparison	*p*-Value
Estonia vs. Latvia	<0.001
Estonia vs. Lithuania	<0.001
Latvia vs. Lithuania	0.0082

Similarly, differences in the RR score distributions were evaluated using a chi-square test. As the RR scores were ordinal, they were analyzed as categorical variables. Significant differences were observed across the three countries, as presented in Table 5.

Table 5. Chi-square test results for retirement readiness (RR).

Test	Variable	Chi-Square	df	*p*-Value
Chi-Square	RR	6.62	2	0.0365

3.3. Association Analyses

Chi-square tests were conducted to evaluate the relationship between the FL scores and the RR confidence levels. The results are summarized in Table 6, with additional country-specific results shown in Table 7.

Table 6. Chi-square test results for FL and RR.

Test	Variable	Chi-Square	df	*p*-Value
Chi-Square	FL-RR	91.98	14	<0.001

Table 7. Country-specific chi-square test results for FL and RR.

Country	Chi-Square	df	*p*-Value	Significant?
Estonia	0.923	3	<0.001	Yes
Latvia	0.879	3	<0.001	Yes
Lithuania	0.901	3	<0.001	Yes

Cramér's V values were calculated to measure the strength of the FL-RR association, as presented in Table 8.

Table 8. Cramér's V values for FL-RR associations.

Country	Cramér's V	Strength
Estonia	0.052	Negligible
Latvia	0.045	Negligible
Lithuania	0.026	Negligible

3.4. Confidence in Investment Advice

Chi-square analyses were conducted to explore the association between the FL levels and the confidence in investment advice. The results, summarized in Table 9, revealed significant dependencies.

Table 9. Chi-square test results for FL and confidence in investment advice.

Test	Chi-Square	df	*p*-Value
Chi-Square	100.93	10	<0.001

Post hoc pairwise comparisons for the confidence in investment advice across countries are provided in Table 10.

Table 10. Pairwise comparisons for confidence in investment advice (Bonferroni correction).

Country	Corrected *p*-Value
Estonia vs. Latvia	0.0020
Estonia vs. Lithuania	<0.001
Latvia vs. Lithuania	<0.001

3.5. Financial Product Ownership

3.5.1. Financial Literacy and Financial Product Ownership

Chi-square tests were conducted to assess the relationship between the financial literacy (FL) levels and the ownership of various financial products, including private pensions, life insurance, investment products, and mortgages. The results, presented in Table 11, indicated significant associations between the FL levels and the ownership of most financial products, except for crypto-securities.

Table 11. Chi-square test results for FL and financial product ownership.

Financial Product	Chi-Square	*p*-Value	Significant?
Private pension or retirement	14.84	<0.001	Yes
Life insurance	31.85	<0.001	Yes
Non-life insurance	8.55	0.0139	Yes
Mortgage	43.19	<0.001	Yes
Consumer loans	25.67	<0.001	Yes
Investment product	73.07	<0.001	Yes
Crypto-securities	3.77	0.152	No
None of these	23.31	<0.001	Yes
Do not know/prefer not to answer	0.66	0.719	No

Country-specific chi-square analyses revealed significant relationships between the FL and financial product ownership for Estonia, Latvia, and Lithuania. Table 12 summarizes the results, showing strong statistical significance across all three countries.

Table 12. Chi-square test results by country.

Country	Chi-Square	df	*p*-Value	Significant?
Estonia	621.74	35	<0.001	Yes
Latvia	707.27	35	<0.001	Yes
Lithuania	505.37	35	<0.001	Yes

Cramér's V was calculated to quantify the strength of the FL-FP relationships (Table 13). Moderate associations were observed for all three countries, with Latvia exhibiting the strongest association.

Table 13. Cramér's V values for FL and financial product ownership.

Country	Cramér's V	Strength
Estonia	0.23	Moderate
Latvia	0.24	Moderate
Lithuania	0.20	Moderate

The standardized residuals provided deeper insights into the specific FL levels and their association with financial products. These residuals identified overrepresented and underrepresented financial products for various FL levels, as summarized in Table 14.

Table 14. Key standardized residual patterns by country.

Country	FL Scores	Overrepresented Products	Underrepresented Products
Estonia	Score of 4 Score of 1–2	Private pensions Consumer loans	Crypto-securities
Latvia	Score of 4–5 Score of 1	Investment products Crypto-securities	
Lithuania	Score of 0	Crypto-securities	Life insurance

For example, higher FL levels (scores of 4–5) in Latvia were strongly linked to investment products, reflecting active engagement with advanced financial instruments. In contrast, lower FL levels (scores of 0–1) in Lithuania were associated with crypto-securities, suggesting the appeal of speculative investments to less financially literate individuals.

A heatmap illustrating the associations between the FL levels and financial product ownership is shown in Figure 3. The gradient highlights stronger associations for products such as investment products, mortgages, and life insurance.

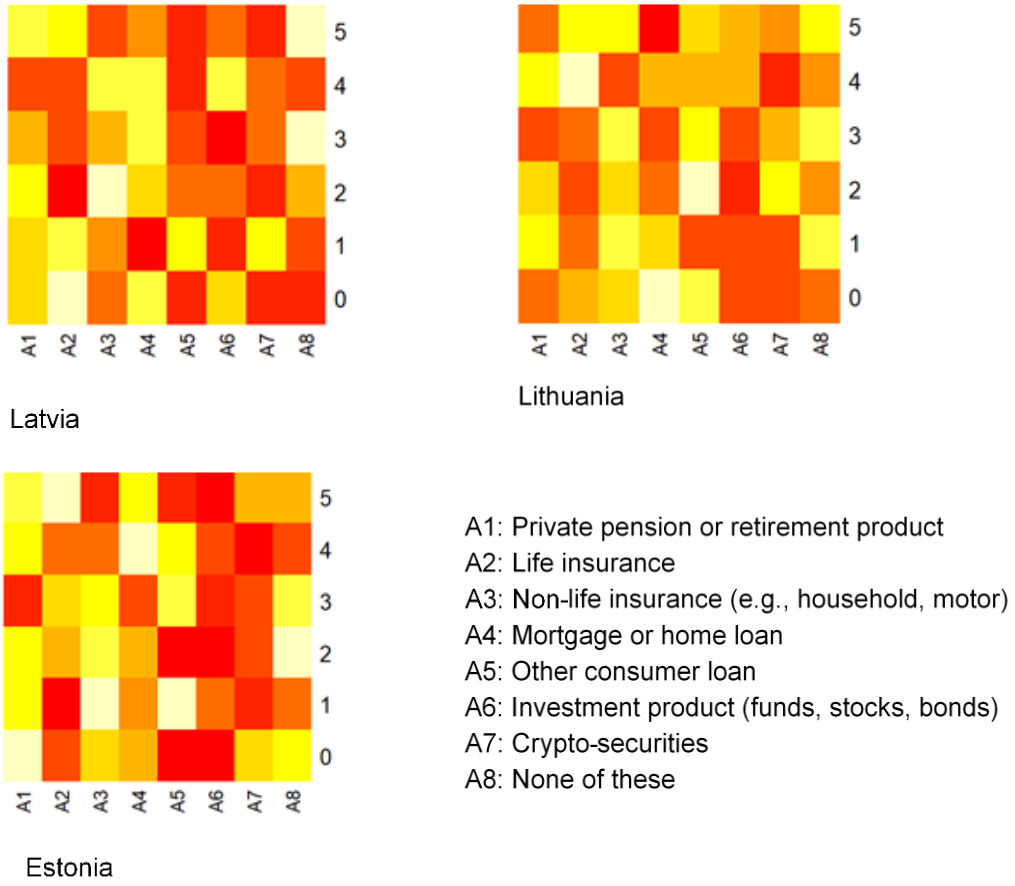

Figure 3. Heatmap of FL levels versus financial product ownership.

3.5.2. Retirement Readiness and Financial Product Ownership

To assess the relationship between financial ownership groups and levels of retirement readiness (RR) across Estonia (EE), Latvia (LV), and Lithuania (LT), a chi-square analysis was employed. The ownership groups were categorized as follows:

- Active investors: Those who own investment products or crypto-securities, representing active financial engagement.

- Borrowers: Those who own loans, such as mortgages/home loans or consumer loans, reflecting potential financial dependence.
- Passive investors: Those who own pensions, life insurance, or non-life insurance, focusing on financial security rather than active investment.
- Non-investors: Those who own no financial products or fall into the "do not know/prefer not to answer" category, indicating a lack of financial engagement.

Chi-square analyses were conducted for each ownership group, evaluating the association between group distributions and RR levels across the three countries. The results are presented in Table 15.

Table 15. Chi-square test results for financial ownership groups and RR levels.

Ownership Group	Chi-Square	*p*-Value	Significant?
Active Investors	43.8	<0.001	Yes
Borrowers	17.0	<0.001	Yes
Non-Investors	18.5	<0.001	Yes
Passive Investors	9.65	<0.001	Yes

Figure 4 illustrates the chi-square statistics for the four ownership groups across Estonia, Latvia, and Lithuania, providing a clear comparison of their associations with RR levels.

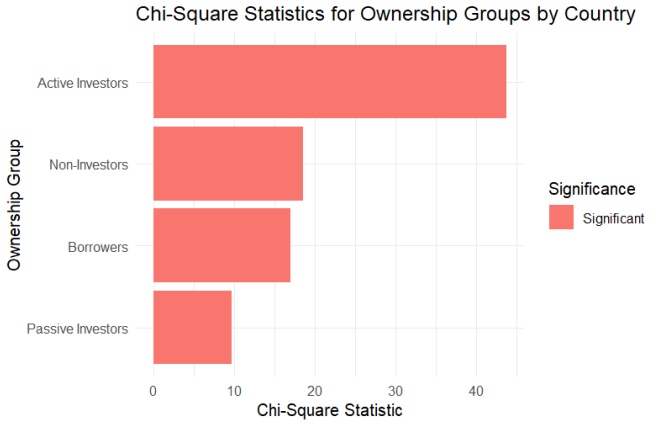

Figure 4. Chi-square statistics for ownership groups by country.

4. Discussion

This study examined the relationships between financial literacy, financial product ownership, and retirement readiness across Estonia, Latvia, and Lithuania. By employing statistical methods such as chi-square tests and Cramér's V, the findings provide robust evidence supporting the hypotheses. Below, we discuss these results, their implications, and their alignment with the existing literature.

4.1. Financial Literacy and Retirement Readiness

The analysis revealed a statistically significant association between financial literacy (FL) and retirement readiness (RR) across Estonia, Latvia, and Lithuania, supporting Hypothesis 1 (H1). Higher FL scores were linked to a greater confidence in retirement readiness, as shown by the chi-square test results ($p < 0.001$) and the measurable associations, though weak, indicated by Cramér's V values below 0.1. These findings align with the existing literature highlighting the role of financial literacy in enhancing retirement preparedness (Lusardi and Mitchell 2011; Yakoboski et al. 2023).

While the association between FL and RR was significant, the relatively weak strength of this relationship suggests the influence of additional mediating factors. This aligns with behavioral finance theories such as those proposed by Thaler and Benartzi (2004), which emphasize non-cognitive barriers, including procrastination, loss aversion, and limited self-control, that may impede the practical application of financial knowledge. Behavioral constraints may prevent individuals with adequate financial literacy from engaging in proactive retirement planning, as evidenced in prior studies (Hastings et al. 2012).

This study also identified country-specific differences in FL and RR, underscoring the heterogeneity within the Baltic region. Estonia consistently outperformed Latvia and Lithuania in both its FL and RR scores. This finding reflects Estonia's strong emphasis on financial education, as demonstrated by its students achieving the highest scores in the OECD PISA financial literacy assessment (OECD 2020; 2024). Additionally, Estonia's strategic focus on enhancing financial wisdom among its adult population through initiatives such as the "Strategy for Developing the Financial Wisdom of the Inhabitants of Estonia 2021–2030" has likely contributed to these outcomes (Republic of Estonia Ministry of Finance 2021).

Conversely, Latvia reported the lowest RR confidence levels, which corresponds to its relatively lower FL scores and potentially weaker engagement with retirement planning. The Bank of Latvia's National Strategy for Financial Literacy (2021–2027) aims to address these gaps by promoting financial inclusion and literacy, yet the results of this study suggest that further efforts are required to translate financial education into improved retirement confidence (Bank of Latvia 2021).

Lithuania's performance, while better than Latvia's, lagged behind Estonia. Surveys conducted by the Lithuanian Banking Association highlight slow progress in improving financial literacy, particularly among vulnerable populations (Bank of Lithuania 2023). The underrepresentation of Lithuanian adults among confident retirement planners suggests that financial literacy efforts need to be paired with practical tools and access to financial products tailored to local needs.

4.2. Financial Product Ownership and Retirement Readiness

Hypothesis 2 (H2), which posited a significant association between financial product ownership and retirement readiness (RR), was strongly supported by the results. The findings revealed that the ownership of financial products, particularly those geared toward long-term investments such as private pensions and life insurance, was positively correlated with greater confidence in RR. These results are consistent with previous research emphasizing the role of financial product engagement in retirement preparedness (Beckmann 2013; Ganguly and Prakash 2023).

The chi-square tests conducted in this study confirmed the significant relationship between financial product ownership and RR in all three Baltic countries ($p < 0.001$). Active investors—those owning investment products such as funds, stocks, or bonds—exhibited the highest confidence in their retirement preparedness. On the other hand, non-investors (those owning no financial products) and borrowers (those with consumer loans or mortgages, but no investment-oriented products) exhibited lower RR levels. These results echo prior findings that emphasized the importance of active financial engagement in building retirement confidence (Lusardi and Mitchell 2011).

The relationships between financial product ownership and RR varied across the Baltic countries as follows.

Estonia: Individuals with higher financial literacy (FL) scores were significantly overrepresented among private pension owners, reflecting the country's robust retirement

savings infrastructure. This finding aligns with the Republic of Estonia Ministry of Finance (2021) reports on the success of financial education in promoting structured savings.

Lithuania: While crypto-assets were included in the active investor category, their prevalence among lower-FL individuals highlights a tendency toward speculative behavior in this subgroup. This observation aligns with the findings of Swedbank (2023), which identified financial vulnerability and speculative tendencies in some segments of Lithuania's population.

Latvia: Despite a moderate association between FL and financial product ownership, Latvians with low FL levels were underrepresented among private pension or life insurance owners. This suggests that financial inclusion initiatives, such as those outlined in the National Strategy for Financial Literacy (Bank of Latvia 2021), have yet to fully address the barriers to engagement with secure financial products.

The ownership of financial products, particularly private pensions, has emerged as a critical determinant of RR confidence, consistent with prior findings (Bucher-Koenen and Lusardi 2011; Hira et al. 2009). However, the underrepresentation of individuals with low FL scores among financial product owners highlights systemic barriers to engagement. For instance, individuals with limited FL may struggle to navigate complex investment options or perceive financial products as inaccessible due to costs or administrative burdens (Hastings et al. 2012).

Speculative investments, as observed in Lithuania, further highlight the need for targeted education and regulation. Crypto-securities and other high-risk instruments, while potentially appealing to individuals with limited financial knowledge, do not offer the stability required for effective retirement planning. This finding echoes the concerns raised by Dundure and Sloka (2021) about the propensity of less-financially literate individuals to engage in high-risk financial behavior.

4.3. Country-Specific Differences in Financial Literacy and Retirement Readiness

The comparative analyses confirmed significant differences in financial literacy (FL) and retirement readiness (RR) among Estonia, Latvia, and Lithuania, validating Hypothesis 3 (H3). These differences reflect not only the outcomes of distinct financial education policies, but also variations in the confidence in investment advice and the cultural attitudes toward financial planning.

Estonia achieved the highest FL and RR scores, reaffirming its position as a leader in financial education among the Baltic states. The country's success can be attributed to comprehensive educational initiatives, such as the "Strategy for Developing the Financial Wisdom of the Inhabitants of Estonia 2021–2030" (Republic of Estonia Ministry of Finance 2021). Additionally, Estonia's top ranking in the OECD financial literacy assessment (OECD 2023; 2024) reflects a strong foundation for financial competence starting in early education. The Estonian respondents also exhibited a high confidence in investment advice, particularly from banks and financial advisors. This confidence likely stems from a transparent financial sector and well-regulated advisory services, which enhance the trust in professional guidance. According to Yakoboski et al. (2023), individuals who feel confident in their investment advice are more likely to adopt structured retirement strategies, such as private pensions and diversified investments. Estonia's high confidence levels in investment advice align with this pattern, contributing to the strong correlation observed between FL and RR.

Latvia reported the lowest FL and RR scores, consistent with prior findings highlighting lower levels of financial literacy in Eastern Europe (Klapper et al. 2013). Despite national initiatives like the National Strategy for Financial Literacy 2021–2027 (Bank of Latvia 2021), significant challenges remain in translating financial knowledge into retirement confidence.

One notable barrier is Latvians' relatively low confidence in investment advice. The results from this study suggest that many Latvian respondents perceive financial advice as complex or insufficiently tailored to their needs, limiting their engagement with financial products. This aligns with the findings of Bucher-Koenen and Lusardi (2011), which emphasized the importance of accessible and personalized advisory services in fostering financial product adoption. Additionally, the cultural attitudes in Latvia may contribute to a preference for informal financial planning or reliance on state pensions. These tendencies could reduce the perceived value of professional financial advice, further weakening the FL-RR relationship. Expanding advisory services to be more inclusive and transparent may help bridge this gap and improve retirement confidence.

Lithuania's performance in FL and RR was moderate, reflecting incremental progress in financial literacy initiatives. For example, the Lithuanian Banking Association's campaigns have raised awareness of basic financial concepts, yet significant disparities persist among the adult populations (Swedbank 2023). This is evident in the weaker FL-RR relationship observed in this study compared to Estonia. Lithuanians' confidence in investment advice showed mixed results, with higher-FL respondents generally trusting financial advisors, while those with lower FL scores gravitated toward speculative investments like crypto-assets. This duality aligns with research by Hira et al. (2009), which highlighted the role of financial knowledge in distinguishing between informed and speculative financial behaviors. Moreover, the reliance on speculative instruments among lower-FL individuals suggests a lack of accessible and understandable advisory services tailored to this demographic. As Beckmann (2013) noted, effective advisory services play a crucial role in guiding individuals toward stable, long-term investment strategies. Enhancing the availability and clarity of investment advice in Lithuania could help mitigate speculative tendencies and improve the retirement outcomes.

Across all three countries, confidence in investment advice emerged as a significant mediator between FL and RR. This study's results revealed that individuals who expressed a higher confidence in financial advisors and institutions were more likely to engage with structured retirement planning and exhibit higher RR scores. This finding is consistent with those of Hastings et al. (2012), who emphasized the role of financial advisors in bridging the gap between literacy and actionable financial behaviors.

These findings revealed significant differences in financial literacy and retirement readiness across Estonia, Latvia, and Lithuania, underscoring the need for tailored policy responses.

Estonia exhibited the highest financial literacy and retirement readiness among the three countries, benefiting from strong financial education initiatives. However, trust in financial advisors remains a critical factor influencing engagement with financial products. Policy efforts should focus on enhancing transparency and accessibility in financial advisory services to ensure that individuals fully utilize their financial knowledge in making informed retirement decisions. Expanding digital advisory platforms and promoting unbiased financial guidance could further strengthen retirement preparedness.

Latvia reported the lowest financial literacy and retirement confidence, suggesting that broader financial inclusion and education efforts are needed. Policy interventions should prioritize early financial education programs in schools and workplaces, combined with government-backed financial planning initiatives to encourage participation in retirement savings plans. Additionally, the lack of engagement with long-term financial products indicates a need for subsidies or tax incentives for private pension plans to promote financial security.

Lithuania fell between Estonia and Latvia in financial literacy and retirement readiness, but showed a concerning trend of lower-literate individuals engaging in speculative finan-

cial instruments, such as crypto-assets. Policies should focus on strengthening financial risk awareness campaigns and introducing stricter consumer protection regulations to prevent high-risk investments from undermining retirement preparedness. Furthermore, incentives for long-term savings should be introduced to redirect financial behaviors toward more stable retirement investment options.

4.4. Practical Implications of Weak Associations

While our findings confirm statistically significant associations between financial literacy, financial product ownership, and retirement readiness, the weak Cramér's V values indicate that these relationships, though present, are not particularly strong. This observation has important policy implications, as it suggests that financial literacy alone is not a sufficient determinant of retirement preparedness.

A weak association suggests that, while financial literacy contributes to improved financial behaviors, its practical impact may be constrained by additional variables, such as the following:

- Economic conditions: Income disparities and labor market stability significantly influence retirement-planning decisions.
- Access to financial products: Even financially literate individuals may struggle to act on their knowledge if they lack access to affordable savings and investment options.
- Behavioral biases: Psychological factors, such as inertia and present bias, often prevent individuals from making optimal long-term financial decisions, despite being financially knowledgeable.

Given these complexities, policymakers should adopt a multi-pronged approach to improve retirement readiness. This could include the following:

1. Behavioral interventions: introducing automatic enrollment in pension plans or employer-sponsored retirement schemes to counteract procrastination.
2. Financial product accessibility: ensuring that individuals, particularly those in lower-income brackets, have access to affordable, well-structured financial products.
3. Enhanced financial advisory services: strengthening the role of financial advisors and digital financial planning tools to assist individuals in translating financial literacy into actionable decisions.

Thus, while our results reinforce the importance of financial literacy, they also highlight that financial education alone is insufficient to drive meaningful improvements in retirement readiness. Future policies should, therefore, integrate financial literacy programs with broader economic and behavioral strategies to enhance their practical effectiveness.

5. Materials and Methods

5.1. Data Source

The data for this study were obtained from the Flash Eurobarometer 525 survey, conducted in March 2022 across Estonia, Latvia, and Lithuania. While the survey methodology followed a stratified random sampling approach to ensure representativeness, we acknowledge that differences in the survey response rates across countries may have introduced biases.

Survey response rates can vary due to several factors, including cultural attitudes toward financial topics, differences in accessibility to survey modes (e.g., telephone interviews), and the level of public trust in survey institutions. Such variations could potentially lead to an over- or underrepresentation of certain demographic groups within each country. For instance, individuals with a higher financial literacy may be more inclined to participate

in a financial knowledge survey, thereby skewing the results toward a more financially literate sample.

To mitigate these biases, the Eurobarometer dataset applies post-stratification weighting based on demographic characteristics such as age, gender, and region to align the sample more closely with the national population distributions. However, residual biases may still exist, particularly if the response propensities differ systematically across financial literacy levels or economic backgrounds. Future research could address this limitation by incorporating additional robustness checks, such as propensity score weighting or alternative data-collection methods, to capture underrepresented groups more effectively.

The survey is part of a broader series aimed at capturing the public opinion on economic, social, and financial issues across Europe. In this study, data from Estonia, Latvia, and Lithuania were analyzed, representing the Baltic region.

5.2. Variables Assessed

Financial literacy (FL): a composite score ranging from 0 (lowest literacy) to 5 (highest literacy), derived from questions assessing basic financial knowledge and numeracy skills. These included understanding interest rates, inflation, diversification, and basic calculations. The responses were aggregated to produce a single FL score per respondent.

Retirement readiness (RR): a self-assessed confidence measure of financial preparedness for retirement, rated on a Likert scale from 1 ("not at all confident") to 4 ("very confident"). This variable gauged the perceived financial security and planning adequacy.

Financial product ownership: The categories assessed included the ownership of private pensions, life insurance, investment products, consumer loans, mortgages, non-life insurance, and crypto-securities. These data were used to explore the relationships between FL and RR.

Confidence in investment advice: The respondents' trust in financial advice from banks, insurers, or financial advisors was categorized as "very confident", "somewhat confident", "not too confident", "not at all confident", "not applicable", or "do not know". This variable examined inter-country variation and its role in the FL-RR relationship.

5.3. Statistical Analyses

The statistical analyses in this study were designed to investigate the following central research question: How is financial literacy (FL) connected with retirement readiness (RR) across Estonia, Latvia, and Lithuania? By exploring these connections, this study aimed to uncover the extent to which financial literacy influences individuals' confidence in their financial preparedness for retirement. The analyses were conducted as follows:

- Descriptive statistics: The mean and median FL and RR scores were calculated for each country to understand the central tendencies. Proportional distributions were visualized through density plots, revealing patterns across the Baltic states.
- Normality testing: The Shapiro–Wilk test confirmed significant deviations from normality ($p < 0.05$), necessitating non-parametric methods for further analyses.
- Comparative analyses: The following was performed to compare FL and RR across countries:
    a. Kruskal–Wallis Test: assessed whether the FL scores differed significantly among the three countries, providing a high-level comparison.
    b. Wilcoxon rank-sum test with Bonferroni adjustment: conducted pairwise comparisons of FL and RR scores between country pairs, controlling for multiple comparisons.
    c. Chi-square test: evaluated the differences in RR and confidence in investment advice distributions across countries.

- Association analyses: Chi-square tests examined the dependency between FL scores and RR confidence levels, investigating whether higher FL scores predicted greater RR confidence. The analyses were conducted for the combined dataset and separately for each country.
- Effect size and significance: Cramér's V quantified the strength of associations between FL and RR, with the values interpreted as negligible (<0.1), weak (0.1–0.2), moderate (0.2–0.3), or strong (>0.3).
- Post hoc analysis: Standardized residuals highlighted specific FL categories that contributed significantly to the RR levels. Pairwise comparisons further clarified the FL-RR relationships among countries.

Financial literacy in this study was measured using a composite score derived from the respondents' answers to a set of standardized financial knowledge questions. These questions assessed fundamental financial concepts, including interest rates, inflation, diversification, and basic numeracy. Each correct response contributed to the total financial literacy score, ranging from 0 (lowest literacy) to 5 (highest literacy).

The decision to categorize financial literacy into discrete levels (e.g., low, moderate, and high) was made for both methodological and interpretive reasons. Methodologically, a categorical classification aligns with non-parametric statistical techniques, such as the chi-square test, which are well suited for analyzing ordinal data. Additionally, a categorical representation facilitates clearer policy implications by distinguishing between different proficiency levels, as opposed to treating financial literacy as a continuous variable. This approach is consistent with prior research on financial literacy assessments (e.g., Lusardi and Mitchell 2011; Klapper et al. 2013), which has often employed threshold-based classifications to identify groups in need of targeted financial education interventions.

To enhance transparency, we have provided a more detailed breakdown of our scoring system as follows:

- Low financial literacy (0–1 correct answers): limited understanding of basic financial concepts, indicating a need for foundational financial education.
- Moderate financial literacy (2–3 correct answers): partial knowledge of financial principles, but potential gaps in advanced financial decision making.
- High financial literacy (4–5 correct answers): strong grasp of financial concepts, suggesting a greater capacity for informed financial planning.

By explicitly defining these categories, we aimed to improve the interpretability of our findings and provide actionable insights for policymakers and financial educators seeking to enhance financial literacy and retirement readiness in the Baltic region.

6. Conclusions

This study provides critical insights into the relationships between financial literacy (FL), financial product ownership, and retirement readiness (RR) across the Baltic states of Estonia, Latvia, and Lithuania. The findings demonstrate that higher levels of FL and the ownership of financial products are significantly associated with greater confidence in retirement preparedness, although the strength of these associations varies across the three countries. These disparities underscore the need for tailored financial education programs and policy interventions.

The analysis revealed a statistically significant association between higher financial literacy levels and greater retirement readiness. However, this association, while present, was relatively weak, indicating that other factors also contribute to retirement readiness.

The ownership of financial products, particularly those oriented toward long-term security, such as private pensions and life insurance, emerged as a key determinant of RR. This study also identified a tendency among lower-FL individuals in Lithuania to rely on

speculative investments, further emphasizing the importance of accessible and tailored financial products.

Estonia's strong performance in FL and RR reflects its robust financial education infrastructure and high confidence in investment advice. Latvia and Lithuania, while showing progress, lag behind, with challenges such as lower FL levels, limited engagement with financial products, and skepticism toward financial advice.

6.1. Implications for Policy and Practice

A weak association, as indicated by a low Cramér's V value, suggests that financial literacy and retirement readiness are influenced by multiple factors beyond those examined in this study. This reinforces the need for multi-faceted policy approaches that incorporate behavioral interventions, financial inclusion strategies, and broader economic reforms in addition to financial education programs.

For policymakers, these weak associations indicate that, while financial literacy initiatives are valuable, their impact on retirement readiness may be constrained unless coupled with other interventions. Some examples are provided below:

- Financial literacy programs should be complemented with nudges, such as automatic enrollment in pension schemes, to counteract behavioral biases that may hinder financial decision making.
- Efforts to increase trust in financial advisors and institutions could enhance the practical impact of financial literacy, as individuals may require additional guidance to translate knowledge into actionable financial behaviors.
- Policymakers should also consider socio-economic factors, such as income disparities and access to financial services, which may mediate the relationship between financial literacy and retirement readiness.

Although weak associations may seem to suggest a limited impact, they highlight the complexity of financial decision making and the need for integrated policy solutions. Future research should explore these relationships further, incorporating qualitative insights and longitudinal data to assess how financial literacy interventions translate into real-world financial behaviors over time.

6.2. Limitations of This Study

This study has several limitations. First, it relied on cross-sectional data, which limited its ability to establish causal relationships between FL, financial product ownership, and RR. Longitudinal research could provide deeper insights into how these variables interact over time. Second, while this study employed robust statistical methods, such as chi-square tests and Cramér's V, these methods are inherently limited to assessing associations rather than causation. Additionally, the reliance on categorical data, including ordinal variables for FL and RR, restricted the granularity of the findings. The results provide valuable insights into statistical dependencies, but may not capture the full complexity of these relationships. Alternative methods, such as regression analyses or structural equation modeling, could complement this work by exploring potential causal pathways and interactions between variables. Third, the scope of this study was geographically limited to the Baltic states, and its findings may not generalize to other regions with different socioeconomic or cultural contexts.

6.3. Future Research Directions

Longitudinal studies: Examining the evolution of FL, financial behavior, and RR over time would offer a more comprehensive understanding of their interdependencies.

Behavioral insights: Investigating the psychological and behavioral factors, such as procrastination or trust in institutions, that mediate the relationship between FL and RR could inform more effective interventions.

Comparative analyses: Expanding the geographic scope to include other European regions or countries with similar socioeconomic challenges would provide broader insights into the role of financial literacy in retirement planning.

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