FINANCIAL LITERACY AND INVESTMENT BEHAVIOUR: KEY DETERMINANTS OF LIVING STANDARDS IN EASTERN EUROPE

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Abstract
The article investigates the relationship between financial literacy, investment behaviour and living standards in selected Eastern European member states of the European Union. The analysis combines a cross-country descriptive comparative approach with econometric techniques, including Ordinary Least Squares (OLS) regressions and an Instrumental Variables/ Two-Stage Least Squares (IV/2SLS) framework, in order to address the potential endogeneity between investment participation and income. Financial literacy is measured using a composite indicator derived from Eurobarometer 525 (2023), based on the proportion of respondents achieving a high financial literacy score. Investment behaviour is captured through investment participation, proxied by the share of equity and investment fund holdings in the household financial assets. Living standards are assessed using three indicators: median disposable income adjusted for purchasing power parity (PPP), income inequality measured by the Gini coefficient and the risk-of-poverty rate over the period 2010-2024. The econometric results reveal a positive and statistically significant association between financial literacy and key welfare indicators, while the direct effect of investment participation appears weaker in baseline specifications. In the instrumental variables framework, where investment participation is instrumented to mitigate potential reverse causality, the estimated impact on income remains positive but is more moderate in magnitude. Although the relatively small number of observations represents a limitation and warrants cautious interpretation, the findings highlight the important role of financial literacy in shaping investment behaviour and contributing to improved economic well-being. These results offer relevant insights for policymakers in countries characterized by lower living standards and comparatively low levels of financial literacy.

Keywords
investment behavior, financial literacy, living standards, investment share

JEL Classification
G11, G40, G53, I30

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Introduction

Recent climate-related risks have served as a wake-up call regarding the financial vulnerability of the population. The combined effects of the pandemic, natural disasters such as floods, fires, and storms, and the war between Russia and Ukraine have further heightened concerns about future economic stability. In this context, we chose to analyze the importance of financial literacy and investment habits of the population, as a mechanism to enhance households`financial resilience against instabilities generated by climate-related risks. For the relevance of the study, we chose to analyze mainly the countries of Eastern Europe.

The geographical focus on Eastern European countries is motivated by their comparatively lower levels of financial literacy and higher exposure to economic vulnerability. These countries generally occupy the lower half of European financial literacy rankings, suggesting substantial scope for policy interventions aimed at improving financial education and household investment behavior. Moreover, their proximity to the Russia-Ukraine conflict amplifies economic uncertainty, reinforcing the importance of financial resilience and informed financial decision-making. To enhance the comparative dimension of the analysis, the sample also includes selected Nordic countries with high financial literacy scores, such as Sweden, Estonia and Finland, which serve as benchmarks for best practices.

The study aims to contribute to the literature on the relationship between financial literacy and economic well-being through a comparative empirical analysis between 13 European countries. The main objectives are to identify the impact of financial literacy and investment behaviors on living standards, as well as to analyze structural differences between economies with different levels of financial literacy. Thus, we will analyze the relationship between the level of financial literacy, investment behaviors and median income (adjusted to PPP- purchasing power parity), the Gini coefficient and the at-risk-of-poverty rate. The aim is to identify the extent to what extent financial literacy and financial investments influence economic well-being and reduce income inequalities.

Research Objectives:

O1: Investment Share has a positive effect on median income, but this relationship may be affected by endogenous factors.

O2: Countries with a high financial literacy score and a higher investment share have a lower risk of poverty and lower income inequality.

O3: A higher level of financial literacy is correlated with a higher median income (PPP), the effect being statistically significant.

1. Review of the scientific literature

A larger study based on a cross-sectional sample of 142 economies indicates a positive and significant effect of financial education on financial stability, both globally and in high- and middle-income economies. Also, financial inclusion, in combination with a higher level of financial literacy, strengthens the stability of the financial system, while macroeconomic factors play an important additional role (Hosen et. al., 2025).

The significant long-term impact of financial literacy on income and wealth accumulation is examined by De Beckker et al. (2025). The authors also approach the topic from an age-based perspective and observe a higher propensity to save among older individuals, while financially literate younger individuals tend to have higher incomes.

Bucher-Koenen et al. (2024) conclude that financial literacy is related to financial abundance. The study demonstrated that those with a higher level of financial literacy have a greater participation in the capital market (own more assets) and are less likely to experience financial problems. At the Romanian level, Beckmann (2013) analyzed the relationship between financial literacy and population savings. Regarding financial literacy, only 5% of respondents knew about the components of interest, inflation and risk diversification. In 2023, according to the European Commission report, this percentage increased to 13% in Romania, but it is the lowest of all the countries analyzed. The results of this report are analyzed by Beckmann et al. (2023), who correlate financial literacy with a greater propensity to save and lower financial vulnerability. Șimandan et al. (2022) highlight the implications of the lack of financial literacy, such as impulsive buying, indebtedness, and unsustainable consumption. The authors also believe that Romania does not take into account the needs of vulnerable groups, and topics such as ethical consumption, environmental issues and sustainability are very rarely addressed. This study suggests that financial literacy should be complemented by social education in order to increase the standard of living, and Romania, unfortunately, is at a low level in both categories. Using the OLS method on Romanian data, Angel et al. (2025) identify a positive and robust association between financial literacy and financial well-being. The authors emphasize the importance of developing educational programs that facilitate basic financial literacy, for this leads to significant enhancements in individual well-being.

The results of EFAMA (2022) highlight that the difference in how savings are invested (deposits or financial assets) depends very much on the pension system in the respective country. In addition to the pension system, the determining factors for such a high percentage for deposits are: the average income is below the European average, financial literacy is at a low level, and there are too few financial incentives for investment. In Romania, wealth is dominated by real estate assets and bank deposits, with a low participation in risky assets. This structure reduces opportunities for financial capital accumulation and amplifies income gaps in the long term, an effect also reported by OECD (2022). Regarding financial literacy, EFAMA (2022) suggests increasing efforts to increase the level of financial literacy both among young people to familiarize them with financial products and services from a young age, and among adults to be able to better manage their own finances, so that they can save and invest for the future. This conclusion was also reached by Arrondel et al. (2015). Following the correlation between stock market returns, risk aversion and financial literacy, the authors demonstrated that there is a positive relationship between them, and that participation in the stock market is strongly linked to children's exposure to this type of financial context since childhood.

Batsaikhan et al. (2018) examine how financial literacy supports inclusive economic growth in the EU: as individuals become more financially literate, they make better

saving decisions, invest in moderate-risk instruments, and contribute to financial market stability. Financial literacy becomes more important with higher levels of economic development.

One of the most robust empirical results comes from studies by Van et. Al (2011), which shows that financial literacy is a strong predictor of capital market participation. People with higher levels of financial knowledge are more likely to own stocks or mutual funds. Another approach to quantifying financial well-being (Nițoi et al. 2022) is by correlating socio-economic characteristics with the degree of financial knowledge and skills. The positive and significant causal effects of financial education on capital market participation and specifically on pension planning are analyzed by Fong et. al. (2025) and Zhuang et. al. (2025). According to them, higher financial literacy substantially increases the probability of owning stocks and mutual funds by increasing the development of long-term savings strategies.

Regarding the dispersion of investments in risky financial assets, it is observed that the positive effect of financial education on them is more amplified in households with a higher share of elderly people (Leng et al., 2025). Another study highlights the significant improvement of the financial security of the elderly through the integration of e-commerce in rural areas and the existence of financial education, which plays a moderating role in the relationship between rural e-commerce and pension security (Zhang et al., 2025)Farcas (2024) highlights that those with a higher level of financial literacy are more likely to invest in financial instruments, such as stocks or bonds, which suggests the existence of a relevant mechanism for explaining the relationship between investment behavior and income levels. According to the author, improving financial literacy can be achieved both through government interventions and through educational initiatives carried out by various public or private entities. The results of a comparative study based on historical data indicate an increase in the level of financial knowledge at the population level, associated with the organization of seminars by financial institutions and the promotion of investment behavior through the media.

Increasing the level of capital market investment is not sufficient without being correlated with financial literacy, because portfolio risk is better controlled in countries where the level of financial literacy is higher (Bianchi, 2017). To establish the relationship between financial literacy and population wealth, Behrman et al. (2012) use an instrumental variables (IV) approach. Linear regression models show that investments in financial literacy could have substantial benefits on personal wealth.

Hamurcu et. al. (2025) proposes a portfolio-centered behavioral model to analyze how multidimensional components of financial education influence risk tolerance among investors. The conclusions emphasize that financial literacy is reflected in risk-related investment decisions mainly through concrete behaviors, which highlights the need for financial education programs oriented not only towards the accumulation of knowledge, but also towards the formation of proactive investment behaviors.A growing notion is that of digital financial literacy. Recent findings suggest that it significantly influences financial well-being and personal finance management behavior, particularly by reducing financial stress and strengthening long-term financial security, with direct implications for public policies aimed at financial inclusion and resilience (Chhillar et.

al. 2025). Active users of financial technologies tend to save more, especially when they have an adequate level of financial literacy (Başar et. al. 2025)
Another approach to digital financial education is in connection with the ESG performance of companies (Fan et al., 2025). Panel data highlights a positive relationship between them, with strong effects on the social dimension. The results obtained through regressions with instrumental variables confirm the robustness of this relationship, highlighting the role of digital financial education in promoting corporate sustainability in emerging economies.
The existing literature highlights the role of financial literacy in shaping investment behaviour and economic well-being outcomes, including income levels, savings and poverty reduction. Empirical studies suggest that higher financial literacy is associated with greater participation in financial markets and more favourable economic outcomes; however, evidence regarding the direct link between investment participation and living standards remains mixed, partly due to issues of endogeneity and reverse causality. Moreover, cross-country comparative analyses focusing on Eastern European economies are relatively limited. In the context, the present study adopts a comparative economic approach based on OLS regressions and Instrumental Variables frameword to provide a more rigorous assessment of the relationship between financial literacy, investment behavior and living standars.

2. Research methodology

The hypothesis is demonstrated by combining several analysis models. The data used for the study were collected from official databases: Eurostat and OECD, and these include: Total financial assets, Currency and deposits, Equity and investment fund shares, Insurance, pensions and standardised guarantees (for the period 2010-2024), Median Income, Gini coefficient, Risk of poverty or social exclusion (for the period 2015-2024) and Financial literacy score (Eurobarometer 525 published 2023- we used the percentage for high level of financial knowledge).
The IV strategy aims to isolate the causal effect of investment participation on income by mitigating reverse causality concerns. Household deposits (as a share of total financial assets) are used as an instrument for investment participation. This instrument is closely related to the structure of the financial portfolio, being associated with households that have a preference for liquid assets and have a higher risk aversion. This relationship is empirically confirmed in the first-stage regression. However, deposits may also reflect precautionary saving behaviors associated with income uncertainty; the results of Model IV are interpreted as being directional, not strictly causal.
We chose to approach the OLS method in the study. It presents the association between financial education, investments and living standards, and the 2SLS method because it captures an effect closer to the causal relationship between investments and income, by eliminating the influence of reverse causality.
We note that the small sample size (13 countries) and their geographical location restrict the statistical power and limit the generalizability of the results. Thus, the small number of observations may affect the precision of the coefficient estimates. The results should be interpreted as exploratory evidence rather than as definitive causal relationships.

For the first hypothesis, we used the ordinary least squares (OLS) method and then the instrumental variables / two-stage least squares (IV/2SLS) method. The actual calculation was done in Python (see appendix no. 1).

The basic form for this hypothesis is:

$$MedianIncome=\alpha+\beta*InvestShare+\gamma*Gini\_coef+\delta*PovertyRiskRate+\varepsilon \quad (1)$$

Where:

MedianIncome - Median equivalised net income PPP-adjusted

InvestShare - Investment Share coefficient calculated by dividing Equity and investment fund shares by Total Assets) -%GDP

Gini_coef – Gini coefficient, a measure of income inequality

PovertyRiskRate – poverty risk rate

α - intercept (average value of median income when other factors are zero)

β,γ,δ – regression's coefficients

ε – residual variable (captures other unobserved factors)

Based on this formula, the OLS model can be constructed:

$$\frac{min}{\alpha,\beta,\gamma,\delta}\sum(\varepsilon)^2=\sum(MedianIncome-\alpha-\beta*InvestShare-\gamma*Gini\_coef-\delta*PovertyRiskRate)^2 \quad (2)$$

Because the InvestShare variable may be endogenous, we applied an instrumental variables (IV) approach, using Deposits as the instrument.:

$$\widehat{InvestShare} = \alpha+\beta*Deposits+\gamma*Gini\_coef+\delta*PovertyRiskRate \quad (3)$$

By applying this model, the variable $\widehat{InvestShare}$ (InvestShare_hat) is obtained, which represents the estimated value of the InvestShare variable, explained only by the exogenous instruments. This variable is used in the second stage of the model to measure the causal effect of investments on median income, eliminating the endogeneity problem:

$$MedianIncome=\alpha+\beta*\widehat{InvestShare}+\gamma*Gini\_coef+\delta*PovertyRiskRate+\varepsilon \quad (4)$$

To test hypothesis O2, multiple linear regression models were estimated in Excel, with the Gini coefficient and the at-risk-of-poverty rate as dependent variables, and the financial literacy score and the Investment Share variable as independent variables:

$$Gini\_coef =\alpha+\beta*FinancialLiteracy+\gamma*InvestShare+\varepsilon \quad (5)$$

Where

FinancialLiteracy - Financial literacy score acording to Eurobarometer 525 (we used the percentage for high level of financial knowledge)

$$PovertyRiskRate =\alpha+\beta*FinancialLiteracy+\gamma*InvestShare+\varepsilon \quad (6)$$

The results obtained by applying the above formulas are presented in the following tables.

The correlation between the variables is moderate, and the model is partially explained by the variation in income inequality (only 35% of the variation in the Gini coefficient

is explained by the two variables InvestShare and FinancialLiteracy, while the real variation according to Adjusted R square is only 22%)

Table no. 1. Model Summary for Gini coefficient

Regression Statistics	
Multiple R	0.591695
R Square	0.350103
Adjusted R Square	0.220123
Standard Error	4.154512
Observations	13

Source: Author's analysis using EXCEL

The F values are below the 5% statistical significance threshold, but there is a trend (Significance F is close to 0.12)

Table no. 2. ANOVA Test 1

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	92.98028	46.49014	2.693523	0.115937
Residual	10	172.5997	17.25997		
Total	12	265.58			

Source: Authors' calculations using EXCEL- Data Analysis

The second ANOVA test (Table 3) enables us to formulate the following regression equation:

Gini_coef =28,9773-28,0848*FinancialLiteracy+0,1904*InvestShare (7)

In the second ANOVA test, InvestShare is marginally significant (10%), and the value of 0.01904 shows that an additional percentage point in the share of investments is associated with a 0.19 point increase in the Gini coefficient, given that the level of financial literacy remains constant. In contrast, a one-point increase in the financial literacy score is associated with a 28-point rise in the Gini coefficient.

Table no. 3. ANOVA Test 2

	Intercept	InvestShare	FinancialLiteracy
Coefficients	28.9773	0.190445	-28.0848
Standard Error	4.396953	0.092514	15.46885
t Stat	6.590315	2.058549	-1.81557
P-value	6.15E-05	0.066549	0.099494
Lower 95%	19.18028	-0.01569	-62.5515
Upper 95%	38.77432	0.396579	6.381971

Lower 95.0%	19.18028	-0.01569	-62.5515
Upper 95.0%	38.77432	0.396579	6.381971

Source: Author's analysis using EXCEL

The multiple linear regression model used for the Poverty Risk Rate variable shows that only 34% of the variation of this variable is explained by the other two variables, InvestShare and FinancialLitercy, and the Adjusted R Square value (0.21) indicates a moderate explanatory power, but considering the small number of observations (13), it is normal.

Table no. 4. Model Summary for Poverty Risk Rate

Regression Statistics	
Multiple R	0.583042209
R Square	0.339938218
Adjusted R Square	0.207925861
Standard Error	5.433342659
Observations	13

Source: Author's analysis using EXCEL

The F test (2.57 and significance F 0.125) suggests that the overall model is not statistically significant at the 5% level, but tends towards significance at a confidence level of 10-15%, which justifies the interpretation of the observed trends.

Table no. 5. ANOVA Test 1

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	152.0371063	76.01855315	2.575048477	0.125291884
Residual	10	295.2121245	29.52121245		
Total	12	447.2492308			

Source: Author's analysis using EXCEL

The regression equation according to the ANOVA test is the following:

PovertyRiskRate =24,74-43,5692*FinancialLiteracy+0,1849*InvestShare (8)

InvestShare (coefficient = 0.185; p = 0.157) has a positive effect, but it is statistically insignificant, while FinancialLiteracy (coefficient = -43.57; p = 0.0567) has a negative effect and is significant at the 10% level, indicating that countries with higher levels of financial literacy tend to have a lower risk of poverty.

Table no. 6. ANOVA Test 2

	Intercept	InvestShare	FinancialLiteracy
Coefficients	24.74235	0.184907	-43.5692
Standard Error	5.75041	0.120991	20.23042
t Stat	4.30271	1.528264	-2.15365
P-value	0.001555	0.157439	0.056715
Lower 95%	11.92963	-0.08468	-88.6454
Upper 95%	37.55506	0.454492	1.507028
Lower 95.0%	11.92963	-0.08468	-88.6454
Upper 95.0%	37.55506	0.454492	1.507028

Source: Author's analysis using EXCEL

Testing hypothesis O3 is carried out by estimating a simple linear regression model, built to analyze the relationship between financial education and median income.

$$\text{MedianIncome} = \alpha + \beta * \text{FinancialLiteracy} + \varepsilon \quad (9)$$

The obtained results from the estimation of simple linear regression indicate the existence of a positive and statistically significant relationship between the level of financial education and median income. The estimated positive coefficient (β=34,092.71, p=0.0068 – Table no. 9) suggests that a higher level of financial education score is associated with higher average income. The value of the coefficient of determination R2=0.50 (Table no. 7) shows that the model explains approximately half of the variation in income between the analyzed countries, highlighting the partial relevance of financial education in explaining differences in living standards.

Table no. 7. Model Summary for Median Income

Regression Statistics	
Multiple R	0.707343
R Square	0.500334
Adjusted R Square	0.45491
Standard Error	3018.943
Observations	13

Source: Authors' calculations using EXCEL- Data Analysis

The F test (11.01, p=-0.0068) indicates that the model is statistically significant at a global level, confirming that financial education significantly expalins the variation in median income across countries.

Table no. 8. ANOVA Test 1

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1E+08	1E+08	11.0147	0.006845
Residual	11	1E+08	9114015		
Total	12	2.01E+08			

Source: Authors' calculations using EXCEL- Data Analysis

According to the ANOVA teste the regression equation is the folowing

MedianIncome =6264.367+34092.71*FinancialLiteracy (10)

The coefficient associated with the Financial Literacy variable is statistically significant at the 1% level (p=0.0068), suggesting that the increase by one-unite in the financial literacy score is associated with an increase of approximately 34,092.71 ajusted monetary units in median income adjusted for purchasing power parity. From an economic perspective, this result provides an empirical explanation for the fact that countries with higher levels of financial literacy tend to achieve higher average incomes compared to countries with lower levels of financial literacy.

Table no. 9. ANOVA Test 2

	Intercept	FinancialLiteracy
Coefficients	6264.367	34092.71
Standard Error	2814.1	10272.48
t Stat	2.226064	3.318839
P-value	0.047855	0.006845
Lower 95%	70.57408	11483.14
Upper 95%	12458.16	56702.29
Lower 95.0%	70.57408	11483.14
Upper 95.0%	12458.16	56702.29

Source: Authors' calculations using EXCEL- Data Analysis

3. Results and discussion

The econometric results highlight a robust positive association between financial literacy and median household income. This result is consistent with the literature, which emphasizes the role of financial literacy in making efficient savings and investment decisions.

The econometric analysis conducted to test the first hypothesis (see Appendix no. 2) examines the relationship between the structure of household financial assets and median income across Eastern European countries. The estimates obtained using the OLS method indicate the existence of a positive and statistically significant association between the share of financial investments in total assets (InvestShare) and median income, with the estimated coefficient being 137.1. This result suggests that a one

percentage point increase in investment participation is associated with an increase of approximately 137 adjusted monetary units in median income (expressed in purchasing power parity terms).

In contrast, the at-risk-of-poverty rate exerts a strong and statistically significant negative effect on median income, while income inequality, as measured by the Gini coefficient, is not statistically significant in this model. The value of the coefficient of determination R2 (0.57) indicates that the model explains a substantial part of the variation in median income across countries.

To correct for the potential endogeneity problem in the relationship between investment participation and income levels, an instrumental variable approach is used, in which household deposits are used as an instrument for the InvestShare variable. The first-stage regression confirms the relevance of the instrument, highlighting a negative and significant association between deposits and investment participation. In the 2SLS estimation, the coefficient on InvestShare remains positive and statistically significant, but its magnitude is reduced to 109.6, suggesting that OLS estimates may overestimate the real effect due to endogeneity. However, the results indicate Investment participation is closely that investments in capital markets contribute to income growth, but their effect is mediated by broader institutional and socioeconomic factors.

Overall, the results indicate that household financial investment is positively associated with living standards, but the strength of this relationship is more moderate after endogeneity correction. At the same time, the persistent and negative effect of poverty risk highlights the importance of poverty dynamics as a major determinant of income differences across countries

A graphical representation of the econometric analysis is presented in figure no.1. The coefficient estimated by the OLS method (≈137) is higher than that obtained by IV-2SLS (≈110). The fact that both coefficients are positive and statistically significant confirms the favorable effect of investments on income. The difference between the two estimates suggests a possible endogeneity: it is likely that investments are correlated with unobserved factors (e.g. general economic performance) that also affect income. The use of the IV method reduces this problem, resulting in a smaller but more robust coefficient. The error bars (95% confidence intervals) show that the OLS estimates are more precise (lower variance), but may be less reliable if the model suffers from endogeneity.

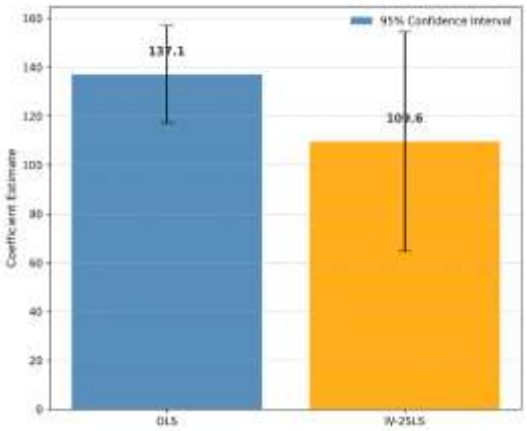

Figure no. 1: Estimated Effect of Investment Share on Median Income

Regarding the investment share in GDP (Investment Share) and median income adjusted to purchasing power parity (PPP) (Figure no. 2), a clear positive trend is observed between investment in the economy and median income of the population: as the investment share increases, median income tends to be higher. However, there is visible dispersion around the regression line — which suggests that other factors (inequality, labor market structure, education, etc.) can also significantly influence median income.

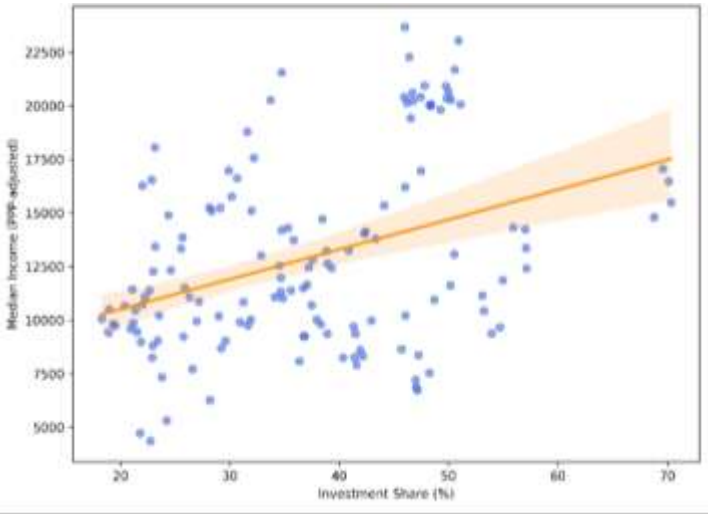

Figure no. 2: Relationship between Investment Share and Median Income (PPP)

Econometric models (OLS and IV) confirm that investments can contribute to increasing disposable income, but the effect is conditional on financial inclusion and the degree of economic education.

Hypothesis O2 is partially demonstrated by multiple linear regression models. These aimed to analyze the influence of the level of financial literacy and the share of investments in total assets on income inequality (measured by the Gini coefficient) and on the risk of poverty (ProvertyRiskRate). The results obtained are relatively similar for both dependent variables, which is why we will analyze them simultaneously. The model highlights the existence of a moderate relationship between the variables, the multiple correlation coefficient (Multiple R = 0.59 for the Gini coefficient and 0.58 for PovertyRiskRate) indicating a medium positive association between the explanatory variables and income inequality, respectively the risk of poverty.

The value of the coefficient of determination (R^2 = 0.35-Gini, 0.33-Poverty) shows that approximately 35% of the variation in the Gini coefficient, respectively 33.9% of the at-risk-of-poverty rate is explained by the InvestShare and Financial literacy score variables, which suggests a partial explanatory capacity of the model. After adjusting for the small number of observations (13 countries), the adjusted R^2 value decreases to 0.22 and 0.20, respectively, indicating that the model has a modest statistical significance, but is relevant for exploring the phenomenon under analysis.

Regarding the overall significance of the model, the F test (F = 2.69, p = 0.1159 – Gini, respectively F=2.57, p=0.1252 - Poverty) indicates marginal significance, which means that, at a confidence level of 10%, the model can be considered statistically acceptable.

The analysis of individual coefficients highlights relevant differences between the effects of the two independent variables. The coefficient associated with the financial literacy score is negative and statistically significant at the 10% level (-28.08; p=0.099), suggesting that a higher level of financial literacy is associated with a reduction in income inequality. This result indicates that, in countries where the population has more advanced financial skills, the distribution of income tends to be more balanced

In contrast, the coefficient corresponding to the share of investments in total financial assets (InvestShare) is positive and significant at the 10% level (0.19; p=0.066), suggesting that an increase in investment participation may be associated with a slight increase in income inequality. This result may reflect the fact that access to investment instruments is higher among people with higher incomes, thus contributing to the increase in income differences.

In the regression with poverty risk as the dependent variable, the coefficient for financial education is negative and statistically significant at the 10% level (-43.59; p=0.056), indicating that countries with higher levels of financial education tend to have lower poverty risk. This result suggests that a more financially educated population is better able to save, invest effectively and manage economic risks, thus reducing the likelihood of social exclusion

In contrast, the InvestShare variable has a positive but statistically insignificant coefficient (0.185; p= 0.157), indicating that the relationship between investment participation and poverty risk is not statistically robust in this sample.

Overall, the results suggest that financial education plays an essential role in reducing economic inequality and poverty risk, while increasing the share of investments, in the absence of an adequate level of financial knowledge among the population, may contribute to increasing income polarization.

The third hypothesis is supported by the econometric model. According to it, there is a positive and statistically significant relationship. One explanation for this result is that financial literacy increases the population's ability to save, invest and manage financial resources efficiently, leading to an increase in individual and collective income. Also, a more financially literate population is more active in the labor market and adopts rational economic behaviors (planning, diversification, debt reduction).
The positive correlation between the level of financial literacy and income for the analyzed countries can be observed in Figure no. 3. Countries with a high level of financial literacy such as Sweden, Finland and Slovenia also record the highest median incomes, while countries where the level of financial literacy is below 25% (Romania, Bulgaria, Hungary) have low median incomes.

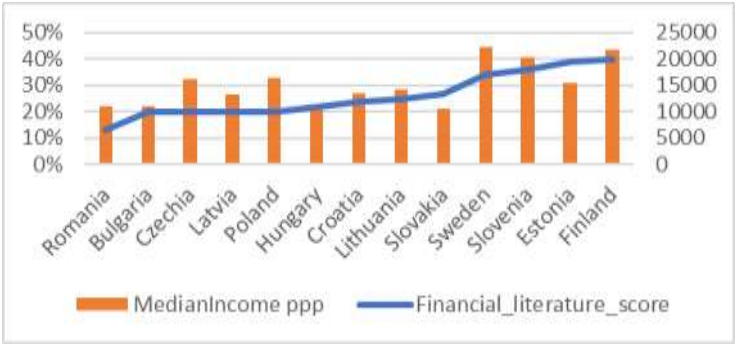

Figure no. 3: Relationship between Financial_literature_score and Median Income (PPP)

Regarding the correlation between the Investment Share and Financial Literacy variables, it is 0.406, meaning a weak/moderate positive correlation, suggesting a modest linear relationship. For our study, it is relevant that it is positive, since according to the analysis carried out, the level of investments depends very much on the standard of living and the savings made by the population. For that part of the population that chooses to create and manage their own portfolio, it is essential to have the necessary knowledge to manage and diversify the portfolio. Goetzmann et. Al (2008) draw attention to the fact that the main reasons for portfolios being underdiversified are the lower level of education of investors, compared to those who have diversified portfolios.

Conclusions

The results of the analysis indicate that investment participation is strongly associated with financial literacy. Investment participation is associated with higher levels of median income, indicating a link between the development of capital markets and living standards. The differences between the estimates obtained through the OLS model and that of the instrumental variables highlight the importance of controlling for endogeneity in order to obtain robust conclusions

Financial education is an essential factor in reducing the risk of poverty, and investments generate sustainable economic benefits only when supported by an adequate level of financial literacy. In this context, financial education can be interpreted as an indirect mechanism of social protection.

From a policy perspective, the results imply that strategies aimed at improving living standards should prioritize financial literacy as a complementary condition for effective financial inclusion. Policies that merely expand access to investment products, without parallel efforts to enhance financial education, risk exacerbating inequality rather than improving overall welfare. Targeted financial education programs, early literacy initiatives, and transparent financial markets can therefore play a crucial role in strengthening household resilience and supporting sustainable improvements in economic well-being, particularly in economically vulnerable regions.

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Appendix

Appendix no. 1 Python cod for OLS, IV/2SLS

```
import pandas as pd
import statsmodels.api as sm

# A. Load the datasets
df_income = pd.read_csv("BazaDate_Python_Income.csv")
df_main = pd.read_csv("BazaDate_Python.csv")

# B. Merge on country + year
df = pd.merge(df_main, df_income, on=["country", "year"], how="inner")

# C. Clean dataset (drop missing values)
df = df.dropna(subset=["MedianIncome ppp", "InvestShare"])

# D. OLS regression: MedianIncome ~ InvestShare + Gini + PovertyRiskRate
X_ols = df[["InvestShare", "Gini coef", "PovertyRiskRate"]]
X_ols = sm.add_constant(X_ols)
y = df["MedianIncome ppp"]
ols_model = sm.OLS(y, X_ols).fit(cov_type="HC1")

print("\n=== OLS Results ===")
print(ols_model.summary())

# E. IV regression (2SLS, manual approach)
# First stage: InvestShare ~ Deposits + controls
X_first = df[["Deposits", "Gini coef", "PovertyRiskRate"]]
X_first = sm.add_constant(X_first)
y_first = df["InvestShare"]
first_stage = sm.OLS(y_first, X_first).fit()

print("\n=== First Stage (InvestShare on Deposits) ===")
print(first_stage.summary())

# Predicted InvestShare
df["InvestShare_hat"] = first_stage.predict(X_first)

# Second stage: MedianIncome ~ InvestShare_hat + controls
X_second = df[["InvestShare_hat", "Gini coef", "PovertyRiskRate"]]
X_second = sm.add_constant(X_second)
second_stage = sm.OLS(y, X_second).fit(cov_type="HC1")

print("\n=== Second Stage (2SLS Results) ===")
print(second_stage.summary())

# F. Save merged dataset and results
df.to_csv("merged_dataset.csv", index=False)

results_table = pd.DataFrame({
    "Model": ["OLS", "2SLS"],
    "Coef_InvestShare": [ols_model.params.get("InvestShare"),
                         second_stage.params.get("InvestShare_hat")],
```

```
    "StdErr": [ols_model.bse.get("InvestShare"),
               second_stage.bse.get("InvestShare_hat")],
    "pvalue": [ols_model.pvalues.get("InvestShare"),
               second_stage.pvalues.get("InvestShare_hat")]
})

results_table.to_csv("econometric_results.csv", index=False)
print("\nResults saved to econometric_results.csv")
```

Appendix no. 2 Regression results

```
=== OLS Results ===
                            OLS Regression Results
==============================================================================
Dep. Variable:       MedianIncome ppp   R-squared:                       0.570
Model:                            OLS   Adj. R-squared:                  0.561
Method:                 Least Squares   F-statistic:                     71.73
Date:                Thu, 02 Oct 2025   Prob (F-statistic):           7.10e-28
Time:                        21:26:50   Log-Likelihood:                -1313.5
No. Observations:                 140   AIC:                             2635.
Df Residuals:                     136   BIC:                             2647.
Df Model:                           3
Covariance Type:                  HC1
================================================================================================
                     coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------------------------
const          1.664e+04   1588.648     10.473      0.000    1.35e+04    1.98e+04
InvestShare      137.1093     19.883      6.896      0.000      98.139     176.079
Gini coef        -26.6272     80.594     -0.330      0.741    -184.589     131.334
PovertyRiskRate -355.1870     47.489     -7.479      0.000    -448.263    -262.111
==============================================================================
Omnibus:                        3.342   Durbin-Watson:                   0.417
Prob(Omnibus):                  0.188   Jarque-Bera (JB):                2.642
Skew:                           0.208   Prob(JB):                        0.267
Kurtosis:                       2.471   Cond. No.                         393.
==============================================================================

Notes:
[1] Standard Errors are heteroscedasticity robust (HC1)
```

```
=== First Stage (InvestShare on Deposits) ===
                            OLS Regression Results
==============================================================================
Dep. Variable:             InvestShare   R-squared:                       0.258
Model:                             OLS   Adj. R-squared:                  0.242
Method:                  Least Squares   F-statistic:                     15.76
Date:                 Thu, 02 Oct 2025   Prob (F-statistic):           7.45e-09
Time:                         21:26:50   Log-Likelihood:                -526.23
No. Observations:                  140   AIC:                             1060.
Df Residuals:                      136   BIC:                             1072.
Df Model:                            3
Covariance Type:            nonrobust
================================================================================================
                       coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------------------------
const            21.9092      7.507      2.919      0.004       7.064      36.754
Deposits         -0.2437      0.059     -4.161      0.000      -0.359      -0.128
Gini coef         1.7082      0.332      5.141      0.000       1.051       2.365
PovertyRiskRate  -1.0456      0.212     -4.936      0.000      -1.465      -0.627
==============================================================================
Omnibus:                        5.149   Durbin-Watson:                   0.249
Prob(Omnibus):                  0.076   Jarque-Bera (JB):                4.852
Skew:                           0.396   Prob(JB):                       0.0884
Kurtosis:                       2.549   Cond. No.                         526.
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.

=== Second Stage (2SLS Results) ===
                            OLS Regression Results
==============================================================================
Dep. Variable:       MedianIncome ppp   R-squared:                       0.460
Model:                             OLS   Adj. R-squared:                  0.448
Method:                  Least Squares   F-statistic:                     64.24
Date:                 Thu, 02 Oct 2025   Prob (F-statistic):           6.22e-26
Time:                         21:26:50   Log-Likelihood:                -1329.5
No. Observations:                  140   AIC:                             2667.
Df Residuals:                      136   BIC:                             2679.
Df Model:                            3
Covariance Type:                  HC1

================================================================================================
                       coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------------------------
const          1.68e+04   1797.163      9.351      0.000    1.33e+04    2.03e+04
InvestShare hat  109.5808     44.985      2.436      0.015      21.411     197.750
Gini coef         23.2496    114.384      0.203      0.839    -200.940     247.439
PovertyRiskRate -382.7429     61.292     -6.245      0.000    -502.873    -262.612
==============================================================================
Omnibus:                        6.110   Durbin-Watson:                   0.391
Prob(Omnibus):                  0.047   Jarque-Bera (JB):                5.735
Skew:                           0.435   Prob(JB):                       0.0568
Kurtosis:                       2.525   Cond. No.                         398.
==============================================================================

Notes:
[1] Standard Errors are heteroscedasticity robust (HC1)
```