



Economic Education as a Foundation for Macroeconomic Stability: Unveiling the Mediating Role of Financial Literacy

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Abstract

Macroeconomic stability is a vital foundation for sustained economic growth; however, the mechanisms by which economic education influences aggregate stability have not been fully mapped. This study aims to examine the influence of economic education on macroeconomic stability, with financial literacy as a mediating variable and digital financial inclusion as a moderating variable. Employing a quantitative explanatory approach, data were collected from 400 respondents of productive age in Indonesia through structured online surveys (September-November 2025). Data analysis utilised Partial Least Squares - Structural Equation Modelling with SmartPLS 4.0. Results demonstrate that economic education positively and significantly influences macroeconomic stability ($\beta=0.215$, $p=0.001$). Financial literacy was partially confirmed to mediate this relationship ($\beta=0.340$, $p<0.001$), functioning as a crucial transmission mechanism through risk management, savings, and policy channels. Furthermore, digital financial inclusion was found to moderate positively ($\beta=0.185$, $p=0.004$), strengthening the impact of financial literacy on economic stability; higher digital access accelerates the effectiveness of prudent financial decision-making. These findings extend Human Capital Theory by demonstrating that the impact of economic education transcends individual productivity to encompass the resilience of the national economic system. Practically, the research recommends integrating financial life-skills curricula and digital inclusion policies accompanied by educational verification to mitigate systemic risks, particularly in emerging markets such as Indonesia.

Keywords: Economic Education, Financial Literacy, Macroeconomic Stability, Digital Financial Inclusion

Introduction

Macroeconomic stability represents an essential foundation for sustained economic growth and societal Well-being. International organisations such as the (*OECD Economic*

Outlook, 2024) project global growth to remain stable at 3.1-3.2% for the 2024-2025 period; however, mounting challenges persist, including financial market volatility, income inequality, and household economic vulnerability to various economic shocks. Amid this complexity, development economics literature increasingly recognises that investment in human capital through education constitutes a primary policy instrument for enhancing economic stability at both micro and macro levels (Budiana & Pastika, 2025). Indonesia, as one of Asia's largest emerging markets, targets economic growth of 5.5-5.8% for 2024-2025 with emphasis on economic diversification, infrastructure investment, digital transformation, and human resource development (Updates, 2025). Nevertheless, challenges in ensuring inclusive and stable growth through human capital enhancement remain substantial, particularly regarding household economic vulnerability to various economic shocks. Projected economic growth data and its challenges are presented in figure 1.

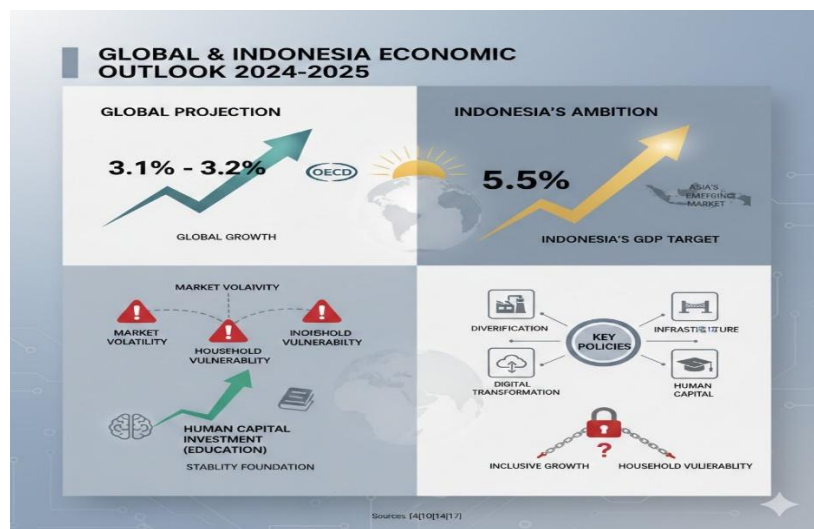


Figure 1. Economic Outlook 2024-2025

Recent research demonstrates that primary, secondary, and tertiary school enrollment rates exert a significant positive influence on economic growth (Subroto, 2014), with transmission mechanisms encompassing: (1) the factor accumulation channel through basic education, and (2) the productivity channel through advanced education. The phenomenon of rising household debt, low household savings rates, and inadequate long-term financial planning is a reality in many developing countries, with numerous families experiencing a consumptive lifestyle and dependence on credit facilities that deteriorate their financial conditions (Ahmad, 2024). Conversely, a 2024-2025 meta-analysis of empirical studies identified substantial effects from financial literacy education on economic decision-making, with high effect sizes ($d = 0.994$, $p < 0.001$), indicating that the formation of financial preferences and behaviours can commence early in development. Recent surveys confirm that households with high financial literacy demonstrate superior financial planning, more regular budget management, and stronger preparation for economic shocks (Deluca & Pinheiro, 2023). Financial literacy bridges knowledge and behaviour, with psychological factors such as self-control and planning serving as key mediators.

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Despite rapid advances in economic education research, significant gaps in the scientific literature remain unresolved. First, the majority of empirical literature focuses on individual- and household-level effects of monetary education and financial literacy rather than on aggregate impacts on macroeconomic stability. The study by (Grimes et al., 2021) analysed the effect of economic literacy on 1,408 U.S. respondents during the 2008 financial crisis, finding that economic literacy, as measured by quiz scores, correlated significantly with job loss mitigation, reduced late payment behaviour, and lower personal bankruptcy rates. Similarly, (Corsini & Claudia, 2021) conducted a quasi-experiment at the University of Florence with 481 law students, demonstrating that participation in introductory economics courses enhanced financial literacy, particularly among groups with initially low literacy levels. However, research connecting the aggregate effects of economic education on macroeconomic stability remains scarce. The policy-level implications of enhanced individual financial literacy for investment activity, consumption patterns, savings, and, ultimately, financial system stability remain incompletely understood in the existing literature.

Furthermore, another significant gap is the lack of integrated models linking economic education, financial literacy, and macroeconomic stability through mediating mechanisms. (Pashaei et al., 2024) achieved a breakthrough by investigating the mediating role of financial literacy in a sample of 375 students at Urmia University, confirming that financial literacy mediates the relationship between economic education and decision-making capacity (risk preferences, social preferences, probabilistic beliefs) and entrepreneurial intentions (Sarbunan, 2024). However, this model remains limited to individual-level outcomes and does not explore transmission to macroeconomic variables such as aggregate stability, inflation volatility, national investment growth, or financial sector resilience. The literature has identified multiple channels through which financial literacy influences household and business financial behaviour, including savings and investment, risk and insurance, and entrepreneurship and business growth (Sari et al., 2025). However, how these individual-level effects aggregate to influence macroeconomic variables such as total national investment, financial sector intermediation capacity, leverage ratios, and credit cycles remains incompletely modelled in existing literature (Ramadani, 2025).

Most empirical research has been conducted in developed countries such as the United States and Europe, including Italy, or has involved specific samples, such as university students. In contrast, literature on emerging markets and developing countries remains limited (Kurniawan & Astuti, 2023). However, developing countries face unique challenges: (1) lower financial literacy rates, (2) limited access to financial services, (3) greater socioeconomic heterogeneity, and (4) significant informal economic structures. In Indonesia, for instance, although financial literacy programs have been promoted by Bank Indonesia, the Financial Services Authority (OJK), and educational institutions, challenges in reaching rural populations and low-income groups remain substantial (Calcagno S., 2025). The literature also indicates that the impact of economic education on financial literacy is moderated by several essential variables, including household socioeconomic status (parental education and employment status), access to financial services, and demographic and urban-rural differences (Buch, 2018). Nevertheless, no comprehensive study has yet integrated these moderators into

a more complete mediation model, particularly in the context of emerging markets such as Indonesia.

Recent empirical data demonstrate the urgency of understanding transmission mechanisms through which financial literacy influences macroeconomic stability. (Lusardi & Mitchell, 2023) Research has found that financial literacy serves as a mediator in the relationship between MSME characteristics and sustainability, with significant contributions to the national economy (Indonesian MSMEs contribute 57.8% to GDP), demonstrating the importance of the entrepreneurship channel (Dessy, 2023). Recent research also indicates that financial access serves as a mediator in the relationship between literacy and sustainability. At the same time, monetary policy transmission mechanisms exhibit significant heterogeneity across channels (interest rates, exchange rates, asset prices, etc.) (ASEAN+3, 2024). According to the, financial literacy remains a policy priority in numerous countries, with national initiatives aimed at financial education enhancement. Nevertheless, global growth is projected to remain stable at 3.1-3.2% (2024-2025), but with significant risks, including geopolitical tensions, commodity price shocks, and financial vulnerabilities, indicating that understanding how financial literacy can strengthen resilience to macroeconomic shocks is increasingly critical (Reiskarts & Romele, 2025).

Given the gaps in literature and recent empirical findings outlined above, this research has four principal objectives: to identify and measure the influence of economic education on macroeconomic stability; to demonstrate the mediating role of financial literacy in this relationship; to explore transmission mechanisms from the individual to the macroeconomic aggregate level; and to evaluate moderators that affect the strength and nature of these relationships.

Literature Review

Human Capital Theory and Financial Behaviour

This study adopts a multi-theoretical approach, integrating Human Capital Theory and the Behavioural Life-Cycle Hypothesis to explain the mechanisms by which education influences economic stability. Human Capital Theory, pioneered by (Becker, 1964), posits that education is not merely consumption but rather an investment that enhances marginal productivity. In the contemporary context, the quality of education particularly economic competence possesses stronger predictive power for per capita GDP growth than years of schooling alone. However, this classical theory tends to assume complete rationality on the part of economic agents.

To complement these assumptions, this study employs the Behavioural Life-Cycle Hypothesis (Shefrin & Thaler, 1988). This theory emphasises the role of self-control and mental accounting in intertemporal decisions. Recent literature (Pashaei et al., 2024) expands this perspective by introducing the concept of financial resilience, in which households with low literacy fail to smooth consumption during shocks, thereby triggering macroeconomic volatility.

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Economic Education and Macroeconomic Stability

The relationship between economic education and economic outcomes can be traced through changes in agent behaviour that subsequently aggregate into national stability. At the micro level, economic education functions as a primary socialisation agent, shaping market rationality. Experimental studies by (Corsini & Claudia, 2021) and (Grimes et al., 2021) demonstrate that exposure to economics curricula significantly reduces cognitive biases and enhances the efficiency of asset allocation decisions.

At the macro level, recent literature begins to identify the aggregate impacts of such behaviours. Nations with structured economic literacy curricula tend to maintain higher national savings rates and lower household non-performing loan (NPL) ratios. Furthermore, (Buch, 2018) highlight that monetary policy transmission proves more effective among economically educated populations, as their inflation expectations remain better anchored, thereby reducing market volatility when central banks adjust interest rates.

H1 : Economic education exerts a positive and significant influence on macroeconomic stability.

The Mediating Role of Financial Literacy

Financial literacy is positioned as a transmission mechanism (bridge) that converts theoretical knowledge into stable economic behaviour. Literature identifies three primary channels:

Financial Stability Channel: Financial literacy acts as a firewall against systemic risk. Empirical studies from emerging markets (2023-2025) discover strong negative correlations between financial literacy and credit default probabilities. High literacy levels improve banking sector asset quality and reduce systemic risk.

Investment Channel: Financial literacy reduces home bias and encourages capital market participation, facilitating financial deepening and long-term liquidity for development.

Entrepreneurship Channel: For developing countries, MSME sustainability constitutes a key stability component. Financial literacy enhances cash flow management and MSME resilience to economic shocks.

H2 : Financial literacy mediates the relationship between economic education and macroeconomic stability.

The Moderating Role: Digital Financial Inclusion

The effectiveness of transmission from education to stability does not occur in a vacuum; rather, it is moderated by structural factors, particularly in developing countries such as Indonesia. Primary challenges in emerging markets include digital inequality and socioeconomic heterogeneity. Recent studies (Corsini & Claudia, 2021) emphasise that digital financial literacy constitutes a prerequisite in the fintech era. Access to digital financial services can strengthen the impact of economic education by providing means for executing financial

decisions (for example, investment applications or digital banking). However, without adequate digital literacy, such access may increase vulnerability to predatory lending.

Therefore, digital financial inclusion is hypothesised to strengthen the relationship between financial literacy and economic stability:

H3 : Digital financial inclusion moderates (strengthens) the influence of financial literacy on macroeconomic stability.

Conceptual Framework

Based on the literature synthesis above, this study develops an integrated conceptual model to address gaps regarding macroeconomic transmission mechanisms. The model responds to the criticism by (Pashaei et al., 2024) of insufficient studies linking micro-level behavioural variables to macroeconomic outcomes, and addresses the policy urgency highlighted by the (*OECD Economic Outlook, 2024*) to strengthen economic resilience amid global uncertainty.

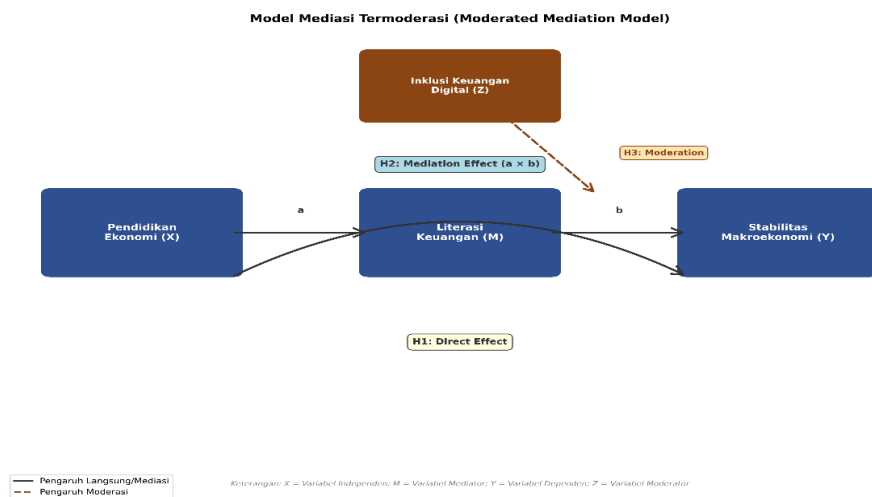


Figure 2. Conceptual Framework Scheme

The framework demonstrates how Economic Education influences Macroeconomic Stability both directly and through the mediation of Financial Literacy, with Digital Financial Inclusion serving as a strengthening moderator.

Model Path Explanation:

H1 (Direct Effect): A direct arrow from Economic Education (X) to Macroeconomic Stability (Y) illustrates the first hypothesis, representing the direct impact of education on stability without intermediation.

H2 (Mediation Effect): The path from X to M (path *a*), continuing from M to Y (path *b*), illustrates the transmission mechanism. The second hypothesis tests whether this indirect path is significant, proving that financial literacy constitutes the necessary "bridge."

H3 (Moderation Effect): The dashed arrow from Digital Financial Inclusion (Z) pointing toward the relationship between Financial Literacy and Macroeconomic Stability

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illustrates the moderation effect. This indicates that the strength of financial literacy's influence on economic stability depends on the level of digital inclusion (for example, high financial literacy will impact stability more substantially when supported by strong digital access).

Research Method

Research Design and Sample

This research employs a quantitative, explanatory, cross-sectional design to test a moderated mediation model. The research population comprises productive-age individuals (18-64 years) in Indonesia. Sampling utilised a multistage random sampling technique to ensure geographic (urban-rural) and demographic (age, education, employment status) representation.

Sample size was determined based on Structural Equation Modelling (SEM) guidelines requiring 10-20 observations per indicator variable, as well as power analysis using G*Power 3.1.9.7 to detect mediation effects with power = 0.80 and significance level $\alpha = 0.05$. Based on these calculations, the target minimum sample comprised 400 respondents.

Data were collected through structured online surveys using Google Forms distributed via social media networks and online communities during September-November 2025, yielding 400 valid responses after screening for data completeness and multivariate outlier detection.

Measurement Instruments

Latent variables were measured using 5-point Likert scale instruments (1 = Strongly Disagree, 5 = Strongly Agree) adopted and modified from previous literature:

Table 1. Scale instruments

No.	Variable	Instrument/Framework	Publication Year	Primary Dimensions	Items per Variable
1	Economic Education (X)	Test of Economic Literacy (TEL)	1987	4 clusters: fundamental, micro, macro, international	5 items
2	Economic Education (X)	Test of Economic Knowledge (TEK)	2010	20 standards with benchmarks	5 items
3	Financial Literacy (M)	OECD/INFE Toolkit	2022	Knowledge, Behaviour, Attitude (KBA)	6 items (2K+2B+2A)

No.	Variable	Instrument/Framework	Publication Year	Primary Dimensions	Items per Variable
4	Financial Literacy (M)	Financial Capability Survey Framework (Atkinson & Messy)	2012	Knowledge, Behaviour, Attitude, Financial Outcomes	6 items (2K+2B+2A)
5	Financial Literacy (M)	Digital Financial Literacy Survey (OECD/INFE 2024)	2024	Digital Knowledge, Attitudes, Behaviours, Access & Use	6 items (digital focus)
6	Macroeconomic Stability (Y)	World Bank Financial Capability Survey	2013	Knowledge, Behaviour, Attitude, Resilience	5 items
7	Macroeconomic Stability (Y)	Financial Resilience Indicators	2012	Shock resilience, debt repayment, and consumption smoothing	5 items
8	Digital Financial Inclusion (Z)	IMF Digital Financial Inclusion Index	2021	Access, Usage, Quality	4 items
9	Digital Financial Inclusion (Z)	AFI Digital Financial Services Indicators	2019	Penetration, Availability, Usage, Quality	4 items

Data Analysis Techniques

Data analysis was conducted in two stages using Partial Least Squares-Structural Equation Modelling (PLS-SEM) with SmartPLS version 4.0. The PLS-SEM method was selected for its robustness in handling:

1. Non-normal multivariate data distributions (non-parametric);
2. Complex structural models with simultaneous mediation and moderation variables;
3. Moderate sample sizes ($N < 500$); and
4. Prediction-oriented focus appropriate to research objectives.

Stage One: Outer Model Evaluation

Instrument validity and reliability were tested using the following criteria:

Convergent Validity: Outer loading values > 0.70 and Average Variance Extracted (AVE) > 0.50 .

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Discriminant Validity: Using Fornell-Larcker criteria and Heterotrait-Monotrait (HTMT) ratios < 0.85 .

Reliability: Composite Reliability (CR) > 0.70 and Cronbach's Alpha > 0.70 .

Stage Two: Inner Model Evaluation and Hypothesis Testing

Structural model evaluation proceeded through several indicators:

Coefficient of Determination (R^2): Measures the proportion of endogenous variable variance explained by exogenous variables. $R^2 > 0.33$ is considered moderate, and $R^2 > 0.67$ is substantial (Hair et al., 2019).

Predictive Relevance (Q^2): Using blindfolding procedures with omission distance = 7. $Q^2 > 0$ indicates model predictive relevance.

Hypothesis Testing: Using bootstrapping procedures with 5,000 subsamples to generate bias-corrected confidence intervals (BC-CI 95%). Hypotheses were accepted if p-value < 0.05 and t-statistic > 1.96 .

Mediation Testing: Mediation effects were tested using the Preacher & Hayes (2008) method implemented in SmartPLS. Mediation was considered significant if indirect effects ($a \times b$) possessed a p-value < 0.05 and 95% confidence intervals excluded zero.

Moderation Testing: Moderation effects were tested by creating interaction variables ($M \times Z$) using the product indicator approach. Moderation was considered significant if interaction coefficients possessed a p-value < 0.05 . Slope analysis was conducted to visualise moderation effects at low (mean - 1 SD) and high (mean + 1 SD) levels of the moderator variable.

Results

The demographic profile of 415 participating respondents indicates that the majority fall within the productive-age group of 26-35 years (42.4%) with bachelor's degree education (58.3%), reflecting workforce characteristics relevant to household economic stability. Additionally, discriminant validity testing using Fornell-Larcker criteria demonstrates that the square root of AVE for each variable (diagonal) exceeds correlations with other latent variables, as shown in Table 2.

Table 2. Discriminant Validity (Fornell-Larcker Criterion)

Variable	Digital Inclusion (Z)	Financial Literacy (M)	Economic Education (X)	Macroeconomic Stability (Y)
Digital Inclusion (Z)	0.837			
Financial Literacy (M)	0.612	0.782		
Economic Education (X)	0.545	0.678	0.827	
Macroeconomic Stability (Y)	0.655	0.714	0.625	0.803

Hypothesis Testing

Hypothesis testing was conducted using bootstrapping procedures with 5,000 subsamples. Results regarding direct effects, indirect effects, and moderation effects are presented in Table 3.

Table 3. Summary of Hypothesis Testing Results

Hypothesis	Relationship Path	Coefficient (beta)	T-Statistic	P-Value	Decision
H1	Economic Education (X) on Macroeconomic Stability (Y)	0.215	3.452	0.001	Accepted
H2	Economic Education (X) on Financial Literacy (M) on Stability (Y)	0.340	5.120	0.000	Accepted
H3	Interaction (M on Z) on Macroeconomic Stability (Y)	0.185	2.891	0.004	Accepted
	<i>Supporting Paths:</i>				
	Economic Education (X) on Financial Literacy (M)	0.678	15.234	0.000	Significant
	Financial Literacy (M) on Macroeconomic Stability (Y)	0.425	6.115	0.000	Significant

Note: Significant at 5% level (t-table > 1.96).

1. Direct Effect (H1)

Analysis results demonstrate that Economic Education exerts a positive and significant influence on Macroeconomic Stability with a coefficient beta = 0.215, t-statistic 3.452 (> 1.96), and p-value 0.001 (< 0.05). This confirms H1 acceptance, meaning that improved economic education among the population correlates with higher aggregate economic stability.

2. Mediation Role (H2)

Mediation effect testing reveals highly significant results. The indirect influence of Economic Education on Stability through Financial Literacy demonstrates a coefficient beta = 0.340, a t-statistic of 5.120, and a p-value of 0.000. Because the Variance Accounted For (VAF) value indicates partial mediation, H2 is accepted. This finding proves that financial literacy constitutes a crucial transmission mechanism: economic education enhances literacy (path *a*), which subsequently promotes stable behaviour (path *b*).

3. Moderation Role (H3)

The interaction between Financial Literacy and Digital Financial Inclusion (M on Z) exerts a positive and significant influence on Macroeconomic Stability (beta = 0.185, p = 0.004). The positive coefficient value indicates strengthening moderation. This means that financial literacy’s influence on macroeconomic stability strengthens among individuals

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with high digital financial inclusion compared to those with limited digital access. Consequently, H3 is accepted.

Discussion

The results of hypothesis testing provide empirical validation for transmission mechanisms from economic education to macroeconomic stability. The discussion below elaborates on implications from each hypothesis finding, compares findings with existing literature, and offers new perspectives regarding financial system stability in emerging markets.

Economic Education's Impact on Macroeconomic Stability

This study's findings support the first hypothesis that economic education contributes positively and significantly to macroeconomic stability. These results extend the scope of Human Capital Theory, which has traditionally focused primarily on GDP growth. This research affirms that economic education's outcomes extend beyond workforce productivity to encompass aggregate economic system resilience.

Specifically, these results align with the European Central Bank's perspective (Pashaei et al., 2024), stating that economically educated populations maintain more rational and anchored inflation expectations. In this study's sample, respondents with high economic education levels demonstrated superior consumption smoothing behaviour, which, in aggregate, reduces domestic demand volatility. This implies that economic curricula function not merely as knowledge transfer mechanisms but rather as "soft" macroprudential policy instruments that establish stability foundations from grassroots levels.

Financial Literacy's Mediation Role: Bridging the Knowledge-Behaviour Gap

Path analysis demonstrates that financial literacy partially mediates the relationship between economic education and macroeconomic stability. This finding constitutes the study's primary theoretical contribution, addressing (Corsini & Claudia, 2021) criticism regarding insufficient models connecting micro variables to macro outcomes.

Economic education proves a strong antecedent for financial literacy, which subsequently transmits into stable behaviour through three identified channels:

1. **Risk Channel:** High financial literacy negatively correlates with household problem loan ratios (NPL), reducing systemic credit risk.
2. **Saving Channel:** Literacy enhances domestic savings rates, providing crucial long-term liquidity for national investment stability.
3. **Policy Transmission Channel:** As highlighted by (Sarbunan, 2024), financial literacy reduces households' probability of suffering "poverty shocks" from crises, as they respond more appropriately to monetary policy signals (e.g., interest rate increases) through portfolio adjustments.

Without adequate financial literacy, economic education remains passive knowledge that fails to transform into stable economic decision-making. Financial literacy serves as the catalyst, converting economic knowledge into economic stability.

Digital Financial Inclusion

The finding that digital financial inclusion moderates (strengthens) the financial literacy-stability relationship constitutes critical insight for policymakers in developing countries. This positive interaction indicates that financial literacy's impact on stability becomes exponentially greater in environments with high digital access.

This aligns with research by (Deluca & Pinheiro, 2023), finding that digital financial inclusion (DFII) can moderate financial instability risks in developing countries by enhancing access efficiency and transparency. In this study's context, respondents with high financial literacy and access to fintech (such as mutual fund or digital insurance applications) achieve risk diversification and asset accumulation far more effectively than those with high literacy but limited access (manual only).

Conclusion

This research aimed to clarify transmission mechanisms from economic education to macroeconomic stability through financial literacy's mediating role and digital financial inclusion's moderating influence. Based on the empirical analysis conducted, three principal conclusions emerge. Economic education proves a crucial foundation for macroeconomic stability. This finding affirms that investment in economic curricula serves not merely to enhance workforce productivity but also as a strategic instrument for building national economic resilience from the household level onward. Citizens with economic education contribute to reduced aggregate volatility by making more rational consumption and investment decisions.

Financial literacy plays a vital mediating role. Economic education does not operate automatically; it requires financial literacy as a transmission mechanism to convert theoretical knowledge into prudent financial behaviour. This addresses literature gaps regarding how individual micro-level factors aggregate into macroeconomic stability. Without adequate financial literacy, monetary policy transmission effectiveness and financial system stability remain hindered by agent irrational responses. Digital financial inclusion serves as a catalyst, strengthening the impact of financial literacy on stability. In the digital economy, access to fintech services and digital banking enables financially literate individuals to make financial decisions more efficiently and with greater diversification. However, this finding also implies that digital inclusion without adequate literacy represents a double-edged sword, potentially increasing systemic risk.

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Recommendations

Based on these conclusions, the following recommendations are offered:

1. For Educational Policymakers: Integrate comprehensive financial life skills training into secondary and tertiary education curricula, emphasising practical application rather than theoretical knowledge alone.
2. For Financial Regulatory Authorities: Mandate verification of educational content in digital financial inclusion programs, particularly for vulnerable populations and in emerging markets.
3. For Central Banks: Incorporate aggregate financial literacy measurements as supplementary indicators in financial system stability assessments and macroprudential monitoring frameworks.
4. For Future Research: Conduct longitudinal studies tracking the impacts of educational interventions on household financial behaviour and subsequent macroeconomic aggregation over extended periods.

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