

Jurnal Ekonomi dan Bisnis

<https://jurnal.unikal.ac.id/index.php/jebi>

From Financial Exclusion to Informal Debt: The Moderating Role of Financial Inclusion

Gilang Kharisma Putra¹, Ninda Fatmawati², Arum Pujiastuti³

¹Management Study Program, Faculty of Economics and Business, Universitas Selamat Sri, Indonesia*

²Artificial Intelligence Study Program, Faculty of Artificial Intelligence and Data Science, Kyungdong University, Korean Republic

³Management Study Program, Faculty of Economics and Business, Universitas Negeri Surabaya, Indonesia

*Corresponding author¹ : gilangkharisma0316@gmail.com

ARTICLE INFO

Article history:

Submitted: 17 September 2026

Revised: 19 September 2026

Accepted: 10 October 2026

Keywords: Alphabetical order;
maximum five keywords.

ABSTRACT

Purpose – This study aims to examine the influence of financial exclusion and distance to bank on informal debt dependence, while investigating the role of financial inclusion in shaping these relationships among communities in Central Java, Indonesia
Design/methodology/approach – This study employed a quantitative explanatory research design using primary data collected through an online questionnaire from 200 respondents residing in Central Java who had experience using formal or informal borrowing. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The analysis included measurement model assessment, structural model evaluation, and bootstrapping for hypothesis testing
Findings – The results show that distance to bank and financial exclusion have positive and significant effects on informal debt dependence. Financial inclusion also has a positive and significant relationship with informal debt dependence, indicating that formal and informal financing may coexist rather than function solely as substitutes. Furthermore, financial inclusion significantly weakens the positive relationship between distance to bank and informal debt dependence. However, its moderating effect on the relationship between financial exclusion and informal debt dependence is not significant.
Research limitations/implications – The study is limited by its cross-sectional design and geographical focus on Central Java. Future research may incorporate financial literacy, financial resilience, digital financial inclusion, income, and behavioral factors.
Originality/value – This study extends the financial inclusion literature by integrating geographical barriers, financial exclusion, and financial inclusion to explain informal debt dependence, while positioning financial inclusion as a moderating mechanism rather than merely an independent predictor

INTRODUCTION

The total length of the manuscript should range between 5,000 and 7,000 words, or approximately 12 to 16 pages. All accepted manuscripts must be written in English and formatted on A4-sized paper using a single-spaced layout, 12-point font size, and justified alignment.

Access to formal financial services is widely recognized as a key pillar of inclusive economic development (D. Mishra et al., 2024). Over the past several decades, countries have implemented various policies and initiatives to expand financial inclusion by improving access to banking services, financial institutions, and digital financial services (Anakpo et al., 2023). Greater financial inclusion is expected to reduce economic inequality, broaden access to productive financing, improve household welfare, and reduce reliance on informal sources of finance (Kling et al., 2022), which often involve higher borrowing costs and provide borrowers with weaker institutional protection. Nevertheless, the expansion of formal financial systems has not fully reached all segments of society, particularly low-income groups and populations living in rural and geographically remote areas (Kyeyune & Ntayi, 2025).

In Indonesia, unequal access to formal financial services remains a significant challenge (Kementerian Koordinator Bidang Perekonomian, 2025). Various financial inclusion initiatives have been implemented (Kementerian Koordinator Bidang Perekonomian, 2026), including the expansion of banking services, microfinance institutions, banking agents, and the digitalization of payment systems. Nevertheless, some segments of the population continue to face barriers to accessing and utilizing these services. Such barriers arise not only from economic constraints but also from complex administrative requirements, limited bank account ownership, inadequate information about financial products, and the geographical distance of formal financial institutions from people's residences. These conditions may encourage individuals to rely on informal sources of financing, such as moneylenders, middlemen, relatives, and other unofficial lenders, because they often provide simpler procedures, faster access, and greater convenience.

Informal debt dependence remains a persistent issue in various regions of Indonesia (Manzilati & Prestianawati, 2021), particularly among rural communities, farmers, fishers, micro-entrepreneurs, and low-income households. Although informal loans offer greater accessibility and faster disbursement, they often involve higher borrowing costs than financing obtained from formal financial institutions. Moreover, informal borrowing relationships may generate persistent debt dependence, limiting individuals' capacity to improve their economic well-being. In many cases, borrowers repeatedly turn to the same informal lenders because they lack accessible and suitable formal financing alternatives (Rehman et al., 2025). Such repeated reliance suggests that informal debt dependence is not merely a temporary response to financial needs but may reflect structural barriers that constrain borrowers' ability to shift toward formal sources of finance.

One factor that may contribute to higher levels of informal debt dependence is financial exclusion (Hemvanich & Chanchaoenchai, 2025). Financial exclusion refers to a condition in which individuals or households face limited access to or limited use of formal financial products and services (Sikka & Bhayana, 2024). Individuals who do not have bank accounts, experience difficulties in obtaining formal credit, or face high transaction costs are more likely to seek alternative sources of financing through informal channels. In this context, financial exclusion may constrain individuals' financing choices by limiting their ability to access affordable and suitable formal credit. Consequently, the greater the degree of financial exclusion experienced

by individuals, the greater their reliance on informal debt to meet consumption needs (Giraldo et al., 2024) or finance productive activities.

Beyond financial exclusion, geographical factors also constitute important barriers to the utilization of formal financial services (Mahmud et al., 2023). Distance to a bank or other formal financial institution represents a physical access barrier that continues to affect many communities (Onyishi et al., 2022), particularly those living in rural areas and regions with limited transportation infrastructure. The greater the distance between individuals' residences and formal financial institutions, the higher the transportation costs, travel time, and transaction costs they may incur. These additional costs can reduce the incentives to utilize formal financial services and make informal sources of financing more attractive because they are often available within borrowers' immediate social and economic environments. Consequently, greater distance to formal financial institutions may increase individuals' reliance on informal debt as an accessible alternative for meeting their financial needs.

On the other hand, financial inclusion is expected to play a strategic role in reducing dependence on informal debt (Kamran & Uusitalo, 2024). Individuals with access to bank accounts, savings facilities, formal credit, and digital financial services have greater financing alternatives, potentially allowing them to obtain funds at relatively lower costs and through more secure mechanisms. Accordingly, financial inclusion serves not only as a development objective within the financial sector (Danladi et al., 2023), but may also function as a buffer against the adverse effects of financial exclusion and geographical barriers on informal debt dependence. In this regard, greater financial inclusion may weaken the extent to which financial exclusion and distance to formal financial institutions translate into reliance on informal debt, particularly by providing alternative channels through which individuals can access formal financial services without being fully constrained by physical or institutional barriers.

Although the relationship between financial inclusion and economic well-being has been extensively examined, studies that simultaneously integrate financial exclusion, distance to bank, financial inclusion, and informal debt dependence remain relatively limited, particularly in developing-country contexts such as Indonesia. Previous studies have predominantly focused on the effects of financial inclusion on savings, investment, and access to formal credit, while less attention has been devoted to understanding the factors that contribute to persistent reliance on informal debt. Moreover, existing research has generally treated financial inclusion as an independent variable rather than examining its potential role as a moderating mechanism that changes the strength of the relationship between financial exclusion, geographical barriers, and informal debt dependence. This gap is particularly relevant because access to formal financial services may not automatically eliminate the effects of financial exclusion or physical barriers to financial institutions. Therefore, examining financial inclusion as a moderating variable provides an alternative perspective for understanding whether greater access to formal financial services can weaken the influence of financial exclusion and distance to formal financial institutions on informal debt dependence.

Based on this research gap, this study aims to examine the effects of financial exclusion and distance to bank on informal debt dependence, with financial inclusion serving as a moderating variable. Specifically, the study investigates whether financial inclusion can weaken the influence of financial exclusion and geographical barriers on individuals' reliance on informal debt. The study is expected to contribute to the literature on financial inclusion and household financing behavior by highlighting the role of financial inclusion as a boundary condition in the relationship between financial access barriers and informal debt dependence. From a practical

perspective, the findings may provide insights for policymakers, financial institutions, and regulators in designing strategies to expand meaningful access to formal financial services and reduce persistent reliance on potentially costly and less-protected informal sources of financing.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Financial Exclusion Theory

Financial exclusion refers to a condition in which individuals or households face barriers to accessing or using formal financial services that are appropriate to their needs (Chylakova & Hunady, 2026). These barriers may include geographical constraints, high service costs, complex administrative requirements, limited financial literacy, and socioeconomic characteristics that prevent certain groups from effectively utilizing formal financial products and services. The concept of financial exclusion has evolved within the broader discourse on social exclusion, highlighting how certain segments of society remain marginalized from the formal financial system and consequently experience limited access to savings, credit, insurance, and payment services (Ediagbonya & Tioluwani, 2023).

According to Financial Exclusion Theory, individuals who are unable to access formal financial institutions are more likely to seek alternative sources of financing that are easier to reach, even when such alternatives involve higher borrowing costs (Simba et al., 2024). In developing-country contexts, this situation is often reflected in the use of informal financing sources, including moneylenders, middlemen, family members, relatives, and other unofficial lenders. Limited access to formal finance therefore constrains individuals' financing choices and may increase their reliance on informal sources of credit. Accordingly, the higher the level of financial exclusion experienced by individuals, the greater their tendency to depend on informal debt (Tran Pham & Nguyen Le, 2024).

Credit Rationing Theory

Credit Rationing Theory, developed by Stiglitz and Weiss (1981), explains why formal financial institutions do not necessarily provide credit to all individuals who require financing. Information asymmetry between lenders and borrowers may lead financial institutions to adopt stringent credit screening mechanisms to minimize the risk of default. Consequently, some individuals who require financing may be denied access to formal credit even when they are willing to pay the prevailing interest rates. This condition reflects the possibility that credit markets may ration borrowers rather than simply adjust interest rates to balance the supply and demand for credit.

Under such circumstances, individuals who are unable to obtain formal credit may turn to informal sources of financing that typically involve simpler requirements and faster disbursement processes (Mpofo & Sibindi, 2022). Informal lenders may therefore become an alternative for borrowers who are excluded from formal credit markets or unable to satisfy institutional lending requirements. From this perspective, Credit Rationing Theory provides a theoretical explanation of how constraints in accessing formal credit can encourage individuals to rely more heavily on informal debt. Thus, persistent restrictions on formal credit availability may contribute to greater dependence on informal sources of financing.

Financial Inclusion Theory

Financial inclusion refers to a condition in which all segments of society have access to affordable, high-quality formal financial products and services and are able to use them sustainably according to their financial needs (Gerald et al., 2022). Financial inclusion extends beyond merely having a bank account; it also encompasses individuals' ability to effectively

utilize savings, formal credit, digital payments, insurance, and other financial services in a responsible manner (Mpofu & Sibindi, 2022). Thus, meaningful financial inclusion involves not only access but also the availability, affordability, suitability, and effective utilization of formal financial services.

The literature on financial inclusion suggests that broader access to formal financial services can improve economic well-being by expanding opportunities for productive financing, strengthening financial risk management, and potentially reducing reliance on informal sources of finance (Mbodj & Laye, 2025). Within the context of informal debt dependence, financial inclusion may therefore provide individuals with alternative channels for obtaining funds when they face financial constraints or barriers to formal financing. Importantly, the availability of formal financial services may also alter the extent to which financial exclusion and geographical barriers translate into reliance on informal debt. Accordingly, financial inclusion can be conceptualized not only as an independent dimension of financial access but also as a moderating condition that may weaken the relationship between barriers to formal financial access and informal debt dependence.

Distance to Bank

Distance to bank represents an important geographical barrier to accessing formal financial institutions (Van Leuven et al., 2024). The greater the distance between individuals' residences and formal financial institutions, the higher the transportation costs, travel time, and transaction costs associated with accessing financial services. These geographical barriers may reduce the frequency with which individuals use formal banking services and limit their opportunities to obtain formal financing (Ambarkhane et al., 2022). Such constraints can be particularly relevant for individuals living in rural and geographically underserved areas, where transportation infrastructure and the availability of financial service points may be limited.

From a transaction cost perspective, higher costs associated with accessing a service tend to reduce individuals' willingness to use that service (Hoagland & Kipping, 2024). When accessing formal financial institutions requires substantial time, travel, and transportation expenses, informal lenders located within individuals' immediate communities may become a more convenient financing alternative. Although informal financing may involve higher borrowing costs, its proximity and accessibility can reduce the non-financial costs associated with obtaining credit. Therefore, greater distance to formal financial institutions may increase individuals' reliance on informal debt as an alternative source of financing.

Informal Debt Dependence

Informal debt dependence refers to a condition in which individuals or households repeatedly rely on non-formal sources of financing as a primary means of meeting consumption needs or supporting economic activities (Manja & Badjie, 2022). Such sources may include moneylenders, middlemen, family members, friends, informal cooperatives, and other lenders operating outside the formal financial system. Unlike temporary or occasional borrowing, informal debt dependence reflects a persistent reliance on informal credit as an important component of an individual's or household's financing strategy.

Informal debt dependence may arise from limited access to formal financial institutions, inadequate financial inclusion, and high short-term liquidity needs (Sripakdeevong & Townsend, 2022). Although informal loans often provide faster access to funds and involve less stringent requirements, their relatively high borrowing costs may increase borrowers' financial burdens and contribute to persistent cycles of indebtedness. Continued reliance on informal debt may consequently constrain households' ability to improve their economic well-being, particularly

when borrowers have limited access to more affordable and sustainable formal financing alternatives.

Distance to Bank and Informal Debt Dependence

Geographical distance from formal financial institutions can shape individuals' choices of financing sources. When accessing a bank requires greater travel time, transportation costs, and effort, individuals are more likely to consider alternative sources that are easier to reach (van Zanden, 2023). Under such circumstances, informal financing may become more attractive because it typically involves simpler procedures, greater flexibility, and closer social or geographical relationships between borrowers and lenders. Empirical evidence supports this relationship. An IMF analysis of the determinants of informal finance use indicates that greater distance from formal financial institutions increases the likelihood of using informal credit (Dabla-norris et al., 2015), particularly among financially constrained groups seeking to meet basic needs (Jama et al., 2025). These findings suggest that geographical barriers are not merely a matter of physical access but can also influence individuals' financing choices.

However, previous studies on informal borrowing have predominantly emphasized socioeconomic characteristics, financial exclusion, income, and household characteristics as key determinants (Ali and Ghildiyal 2023; Sethy et al. 2023; Ullah et al. 2024). The direct relationship between geographical distance to formal financial institutions and the degree of dependence on informal debt has received comparatively limited attention, particularly when informal debt dependence is conceptualized as a behavioral construct distinct from the mere decision to engage in informal borrowing. For example, research on household financial access and borrowing behavior in India has primarily emphasized socioeconomic characteristics in explaining differences between formal and informal credit use (A. K. Mishra & Bhardwaj, 2022). This gap provides an opportunity to examine whether geographical barriers directly contribute to persistent reliance on informal debt. Accordingly, the greater the perceived cost of accessing formal financial institutions, the stronger the incentive for individuals to maintain or increase their reliance on informal sources of debt. Therefore, this study proposes the following hypothesis:

H1: Distance to Bank has a positive effect on Informal Debt Dependence.

Financial Exclusion and Informal Debt Dependence

Limited access to formal financial services can create a gap between individuals' financing needs and their ability to obtain funds from formal institutions (Jatav & Nayak, 2022). When financial needs persist while access to formal financing remains constrained, individuals may seek alternative mechanisms to meet their financial requirements. In communities with strong social networks, informal debt can become a relatively accessible option because it is not entirely dependent on the administrative requirements and procedures imposed by formal financial institutions (Makmur, 2024). This relationship is supported by previous empirical research. Long (2020) demonstrates that informal borrowing is associated with financial exclusion and that limited access to bank branches represents one mechanism linking financial exclusion to the use of informal finance. Similarly, Liu, Li, and Fang (2024) find that households experiencing exclusion from formal credit are more likely to rely on informal borrowing, particularly when exposed to economic risks or financial shocks. Their findings suggest that the use of informal financing under such circumstances may reflect constraints in formal financial access rather than a purely voluntary household preference.

Nevertheless, previous studies have predominantly examined financial exclusion as a condition associated with the likelihood of engaging in informal borrowing, whereas research specifically investigating financial exclusion as a determinant of informal debt dependence remains limited. This distinction provides an opportunity to extend the literature beyond the decision to use informal credit toward understanding persistent reliance on informal debt as a financing pattern. Such a perspective is important because a single instance of informal borrowing does not necessarily indicate dependence, whereas repeated and increasingly dominant use of informal debt may reflect a more persistent form of financial reliance. Accordingly, the greater the constraints individuals experience within the formal financial system, the fewer financing alternatives they may have and the greater their likelihood of repeatedly relying on informal sources of debt. Therefore, this study proposes the following hypothesis:

H2: Financial Exclusion has a positive effect on Informal Debt Dependence.

Financial Inclusion and Informal Debt Dependence

The relationship between financial inclusion and informal debt dependence does not necessarily follow a substitution pattern. Greater access to formal financial services may expand individuals' financing options without necessarily eliminating their use of informal sources of debt (Turkson et al., 2022). Individuals may utilize formal and informal sources of financing simultaneously depending on their financial needs, the amount of funds required, the speed of disbursement, and the flexibility of repayment arrangements available through each source. Research on financial inclusion and informal finance in Morocco indicates that financial inclusion, mobile banking, and various dimensions of financial access are associated with individuals' decisions to use informal finance (Ezzahid & Elouaourti, 2021). This evidence suggests that the expansion of formal financial services does not automatically eliminate informal financing mechanisms. Similarly, research on households in India demonstrates that financial access is associated with choices between formal and informal sources of borrowing, with different groups exhibiting varying preferences for these financing channels (A. K. Mishra & Bhardwaj, 2022).

These findings point to an important research gap. Much of the existing literature tends to conceptualize financial inclusion as a mechanism for reducing the use of informal finance. Cross-country evidence has also suggested that greater financial inclusion may reduce the size of the informal sector as a whole. However, the informal sector should not be equated with informal debt dependence (Rojas Cama et al., 2024). Individuals may become increasingly financially included while continuing to rely on informal debt because of its flexibility, speed, social proximity, or ability to meet financing needs that are not fully accommodated by formal financial institutions. Therefore, this study does not assume that financial inclusion necessarily eliminates informal debt. Instead, financial inclusion may coexist with informal debt use as individuals combine different financing sources according to their circumstances and financial needs. This perspective provides an opportunity to empirically examine a relationship that remains theoretically and empirically inconclusive in the existing literature.

H3: Financial Inclusion has a positive effect on Informal Debt Dependence.

Financial Inclusion as a Moderator of the Relationship between Distance to Bank and Informal Debt Dependence

The effect of geographical distance on informal debt dependence may not be uniform across individuals. Individuals with higher levels of financial inclusion have greater access to alternative channels for obtaining formal financial services, even when they are geographically distant from physical bank branches (Yadav & Siva Reddy, 2023). The availability of digital banking, financial agents, mobile financial services, and other non-physical transaction channels can reduce the practical consequences of geographical distance and facilitate continued access to formal financial services. Previous evidence provides a basis for this argument. IMF research indicates that distance from financial institutions is associated with the use of informal credit, while improvements in financial access can help alleviate barriers arising from limited physical access (Dabla-norris et al., 2015). Research in Indonesia that incorporates average distance to formal financial institutions as a measure of financial access characteristics also highlights the importance of the geographical dimension of financial inclusion (Kadir et al., 2025).

Nevertheless, previous studies have predominantly examined distance as a direct determinant of financial access or informal finance, while financial inclusion has more commonly been treated as an outcome or independent variable (Anyangwe, Vanroose, and Fanta 2022; Bekele 2023; Valera, Lei, and Fong 2025). Relatively limited research has examined financial inclusion as a condition that changes the strength of the relationship between geographical barriers and informal debt dependence. Consequently, it remains unclear whether greater financial inclusion can effectively mitigate the consequences of physical distance from formal financial institutions. This provides an important basis for examining the moderating role of financial inclusion. If financial inclusion provides alternative channels through which geographically distant individuals can access formal financial services, the positive effect of distance to formal financial institutions on informal debt dependence should be weaker among individuals with higher levels of financial inclusion. Therefore, this study proposes the following hypothesis:

H4: Financial Inclusion weakens the positive effect of Distance to Bank on Informal Debt Dependence.

Financial Inclusion as a Moderator of the Relationship between Financial Exclusion and Informal Debt Dependence

The effect of financial exclusion on informal debt dependence may vary depending on the level of financial inclusion experienced by individuals. Exclusion from one particular type of financial service does not necessarily imply complete disconnection from the formal financial system. For example, individuals may face difficulties in accessing formal credit while still maintaining access to bank accounts, payment services, mobile banking, or other formal financial instruments. Such partial access may provide alternative financial channels even when specific financial services remain inaccessible. Previous research suggests that the relationship between financial exclusion and informal borrowing is not straightforward. Long (2020) demonstrates that informal borrowing can occur among both banked and unbanked individuals, while limited access to bank branches represents one mechanism linking financial exclusion to informal borrowing. Similarly, evidence from Morocco indicates that financial inclusion, mobile banking, and informal finance may coexist within individuals' financial behavior (Ezzahid & Elouaourti, 2021). These findings suggest that individuals may simultaneously maintain some degree of access to formal financial services while continuing to use informal sources of finance.

An important research gap therefore emerges. Previous studies have primarily examined the direct effect of financial exclusion on informal borrowing or the relationship between financial inclusion and informal finance, while relatively limited attention has been given to whether financial inclusion changes the strength of the relationship between financial exclusion and informal debt dependence. This issue is important because the availability of alternative formal financial channels may provide individuals with financing options when they encounter barriers to specific financial products or institutions. Accordingly, financial inclusion may function as a buffer against the consequences of financial exclusion. Higher levels of financial inclusion provide individuals with a broader range of formal financial alternatives, meaning that exclusion from particular services may not necessarily translate into greater reliance on informal debt. Therefore, the positive relationship between financial exclusion and informal debt dependence is expected to become weaker as the level of financial inclusion increases.

H5: Financial Inclusion weakens the positive effect of Financial Exclusion on Informal Debt Dependence.

RESEARCH METHODOLOGY

This study uses a quantitative explanatory design to examine the associations of Financial Exclusion and Distance to Bank with Informal Debt Dependence and the moderating role of Financial Inclusion. The target population was residents of Central Java who had borrowed from formal or informal sources. Respondents were selected purposively using the following eligibility criteria: they were at least 18 years old, resided in Central Java, had borrowed money within the previous two years, and completed the questionnaire. The manuscript reports 200 eligible respondents. Because the study uses a cross-sectional questionnaire, the results are interpreted as statistical associations rather than evidence of causal effects. The sample size was 200 respondents. The original sampling rationale referred to 20 indicators and a 10:1 respondent-to-indicator rule for PLS-SEM (Hair et al., 2021), as well as (Roscoe, 1975) general guideline for behavioral and social research. These rules of thumb do not replace a transparent account of recruitment and sample coverage. The final manuscript should therefore report the actual recruitment channels, fieldwork dates, number of invitations or completed questionnaires where available, and respondent characteristics (for example, age group, gender, education, occupation, income category, and district). These descriptive details must be inserted from the original survey records and should not be estimated or invented. The questionnaire was administered using a five-point Likert scale; please verify and state whether data collection was online, offline, or a combination, because the current draft contains inconsistent wording.

Data were analyzed using SmartPLS 4.0 and Partial Least Squares Structural Equation Modeling (PLS-SEM). The measurement model was assessed using outer loadings, Average Variance Extracted (AVE), Cronbach's alpha, rho_A, Composite Reliability (CR), and the Heterotrait–Monotrait ratio (HTMT). The structural model was evaluated using R^2 and model-fit information, and hypotheses were tested with bootstrapping (5,000 subsamples) at a 5% significance level. The manuscript reports outer loadings above 0.70, AVE values above 0.50, reliability values above 0.70, and HTMT values below 0.90 for the reported constructs. Financial Inclusion was specified as a moderator and tested through two interaction terms: Distance to Bank $\times$ Financial Inclusion and Financial Exclusion $\times$ Financial Inclusion. A statistically significant interaction indicates that the strength of the association between a predictor and Informal Debt

Dependence varies with Financial Inclusion. The interpretation of each interaction is based on its coefficient, t-statistic, and p-value.

RESULTS AND DISCUSSION

Convergent Validity Test (Outer Loadings)

Convergent validity was assessed based on the outer loading values, with a minimum recommended threshold of 0.70. The results show that all indicators across the constructs have outer loading values above the recommended threshold, indicating that all indicators are valid in measuring their respective constructs

Table 1

Construct	Indicators	Outer Loading	Noted
Financial Exclusion	X1.1	0,793	Valid
	X1.2	0,773	Valid
	X1.3	0,75	Valid
	X1.4	0,773	Valid
	X1.5	0,781	Valid
Distance to Bank	X2.1	0,874	Valid
	X2.2	0,865	Valid
	X2.3	0,861	Valid
	X2.4	0,869	Valid
	X2.5	0,897	Valid
Financial Inclusion	M.1	0,854	Valid
	M.2	0,876	Valid
	M.3	0,887	Valid
	M.4	0,84	Valid
	M.5	0,902	Valid
Informal Debt Dependence	Y.1	0,887	Valid
	Y.2	0,821	Valid
	Y.3	0,888	Valid
	Y.4	0,829	Valid
	Y.5	0,924	Valid
Financial Exclusion × Financial Inclusion	Interaction	0,984	Valid
Distance to Bank × Financial Inclusion	Interaction	0,863	Valid

Source: Primary data processed (2026)

Overall, all indicators have outer loading values above 0.70 and therefore satisfy the criteria for convergent validity. No indicators were eliminated, and all indicators were retained for the subsequent structural model analysis

Construct Reliability and Validity Test

Construct reliability and validity were assessed to ensure that each latent variable demonstrates adequate internal consistency and explains a sufficient proportion of the variance in its indicators. Construct reliability was evaluated using Cronbach's Alpha, rho_A, and Composite Reliability (CR), while convergent validity was assessed using the Average Variance Extracted (AVE). A construct is considered reliable when Cronbach's Alpha, rho_A, and

Composite Reliability values exceed 0.70, while convergent validity is established when the AVE value exceeds 0.50.

Table 2. Construct Reliability and Validity Test

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE	Note
Financial Exclusion	0,833	0,834	0,882	0,6	Reliabel & Valid
Distance to Bank	0,922	0,923	0,941	0,763	Reliabel & Valid
Financial Inclusion	0,921	0,922	0,941	0,761	Reliabel & Valid
Informal Debt Dependence	0,920	0,921	0,940	0,758	Reliabel & Valid
Moderating Effect 1	1.000	1.000	1.000	1.000	Valid*
Moderating Effect 2	1.000	1.000	1.000	1.000	Valid*

Source: Primary data processed (2026)

Note: Values of 1.000 for Moderating Effect 1 and Moderating Effect 2 are a known artifact of the product indicator approach in PLS-SEM and do not indicate a measurement error.

Overall, all constructs meet the recommended criteria for construct reliability and convergent validity, with Cronbach's Alpha, rho_A, and Composite Reliability values above 0.70 and AVE values above 0.50. Thus, the measurement model demonstrates adequate reliability and validity and is suitable for further structural model evaluation.

Discriminant Validity Test (Fornell–Larcker Criterion)

Discriminant validity was assessed using the Fornell-Larcker criterion by comparing the square root of the Average Variance Extracted (AVE) for each construct with its correlations with other constructs. A construct is considered to demonstrate adequate discriminant validity when the square root of its AVE is greater than its highest correlation with any other construct.

Table 3. Discriminant Validity Test

construct	Financial Exclusion	Distance to Bank	Financial Inclusion	Informal Debt Dependence
Financial Exclusion	0,774	0,753	0,723	0,682
Distance to Bank	0,753	0,873	0,782	0,770
Financial Inclusion	0,723	0,782	0,872	0,760
Informal Debt Dependence	0,682	0,770	0,760	0,871

Source: Primary data processed (2026)

Overall, the Fornell-Larcker results indicate that the square root of AVE for each construct is greater than its correlations with the other constructs. Therefore, all constructs demonstrate adequate discriminant validity based on the Fornell-Larcker criterion.

Discriminant Validity Test (Heterotrait–Monotrait Ratio/HTMT)

In addition to the Fornell-Larcker criterion, discriminant validity was further assessed using the Heterotrait-Monotrait Ratio (HTMT). According to Hair et al., discriminant validity is established when the HTMT value is below 0.90.

Table 4. Discriminant Validity Test

Construct Pairs	HTMT	Criteria	Notes
Informal Debt Dependence - Distance to Bank	0,834	< 0,90	Valid
Informal Debt Dependence - Financial Exclusion	0,78	< 0,90	Valid

Construct Pairs	HTMT	Criteria	Notes
Informal Debt Dependence - Financial Inclusion	0,825	< 0,90	Valid
Distance to Bank - Financial Exclusion	0,857	< 0,90	Valid
Distance to Bank - Financial Inclusion	0,847	< 0,90	Valid
Financial Exclusion - Financial Inclusion	0,823	< 0,90	Valid
Moderating Effect 1 and other constructs	0,029-0,606	< 0,90	Valid
Moderating Effect 2 and other constructs	0,029-0,606	< 0,90	Valid

Source: Primary data processed (2026)

Overall, the HTMT results confirm that all construct pairs have values below 0.90. Therefore, the constructs demonstrate adequate discriminant validity, indicating that each latent variable represents a distinct concept without substantial overlap in measurement.

Model Fit Evaluation

Model fit evaluation was conducted to assess the extent to which the proposed model adequately represents the empirical data. In this study, model fit was evaluated using several measures, including the Standardized Root Mean Square Residual (SRMR), Normed Fit Index (NFI), d_ULS, d_G, and Chi-Square.

Table 5. Model Fit Evaluation

Indeks Model Fit	Saturated Model	Estimated Model	Criteria/Interpretation	Notes
SRMR	0,05	0,05	< 0,08	Fit
NFI	0,87	0,87	Approaching/≥ 0.90*	Acceptable
d_ULS	0,521	0,522	Relatively low	Good
d_G	0,398	0,398	Relatively low	Good
Chi-Square	444,021	444,176	Supporting index	Not primary criterion

Source: Primary data processed (2026)

Overall, the model demonstrates an acceptable level of fit, particularly based on the SRMR value of 0.050, which is below the recommended threshold of 0.08. The NFI value of 0.870 provides additional but more moderate support for model fit, while the d_ULS and d_G values indicate relatively small discrepancies between the empirical and estimated models. Therefore, the model is considered adequate for proceeding to structural model evaluation and hypothesis testing.

Coefficient of Determination (R-Square) Evaluation

The coefficient of determination (R^2) measures the extent to which the exogenous variables explain the variance in the endogenous variable within the structural model. A higher R^2 value indicates greater explanatory power of the model.

Table 6. R-Square

Endogenous Variable	R-Square (R^2)	Adjusted R^2	Variance Explained	Note
Informal Debt Dependence	0,699	0,691	69,90%	Moderate-Substantial

Source: Primary data processed (2026)

Based on the guidelines commonly used in PLS-SEM, an R^2 value of 0.699 indicates a substantial level of explanatory power. Therefore, the structural model demonstrates considerable ability to explain variations in Informal Debt Dependence and provides an adequate basis for subsequent hypothesis testing and analysis of the relationships among the constructs.

Hypothesis Testing

Hypotheses were tested using the bootstrapping procedure with a 5% significance level. A hypothesis was considered supported when the t-statistic exceeded 1.96 and the p-value was below 0.05.

Table 7. Hypothesis Testing

Hypothesis	Variable Relationship	coefficient (β)	t-Statistic	p-Value	Decision
H1	Distance to Bank $\rightarrow$ Informal Debt Dependence	0,367	4,857	0	Supported
H2	Financial Exclusion $\rightarrow$ Informal Debt Dependence	0,286	2,921	0,004	Supported
H3	Financial Inclusion $\rightarrow$ Informal Debt Dependence	0,229	2,429	0,015	Supported
H4	Distance to Bank $\times$ Financial Inclusion $\rightarrow$ Informal Debt Dependence	-0,262	3,475	0,001	Supported
H5	Financial Exclusion $\times$ Financial Inclusion $\rightarrow$ Informal Debt Dependence	0,087	1,247	0,213	Not Supported

Source: Primary data processed (2026)

Overall, the hypothesis testing results show that all three direct relationships are supported. Distance to Bank, Financial Exclusion, and Financial Inclusion each have a significant association with Informal Debt Dependence. Regarding the moderating effects, one interaction effect is significant, while the other is not. Financial Inclusion significantly weakens the positive association between Distance to Bank and Informal Debt Dependence, whereas its moderating effect on the association between Financial Exclusion and Informal Debt Dependence is not statistically significant. Thus, four hypotheses are supported, while one is not supported.

Discussion

The present findings should be interpreted as statistical associations rather than causal relationships, given the cross-sectional nature of this study. Cross-sectional data capture relationships at a single point in time and do not permit conclusions about the direction or mechanism of effects. With this limitation in mind, the following discussion elaborates on the substantive meaning of each finding.

The findings indicate that Distance to Bank is positively associated with Informal Debt Dependence. Individuals residing farther from formal financial institutions tend to report greater reliance on informal sources of financing. This association may reflect the elevated transaction costs, including transportation expenses, time, and opportunity costs, that physical distance imposes on potential borrowers. When financial needs arise urgently, the friction of travelling to a bank branch may render informal lenders more practically accessible, as they are typically embedded within local communities and impose fewer procedural requirements. This pattern is consistent with Credit Rationing Theory (Stiglitz & Weiss, 1981), which posits that access costs function as implicit barriers that exclude individuals from formal credit markets, and with Financial Exclusion Theory, which identifies geographical remoteness as a structural

determinant of financial marginalization. Critically, this association does not imply that distance mechanically causes informal borrowing; rather, distance may be a proxy for a broader cluster of access constraints that together make informal debt a more available option.

The study also finds that Financial Exclusion is positively associated with Informal Debt Dependence. Individuals who face systemic barriers to formal financial services, such as the absence of a bank account, stringent documentation requirements, restrictive collateral conditions, or prohibitively high service costs, appear to have fewer viable alternatives when credit needs arise. Under these conditions, informal lenders including family members, rotating savings groups, or moneylenders may represent the only practically accessible source of funds. This finding aligns with the argument that financial exclusion does not merely reduce financial options but actively redirects financing behaviour toward informal channels (Simba et al., 2024). Importantly, however, the cross-sectional design prevents any inference that exclusion directly produces informal debt dependence; unmeasured factors such as income volatility, financial literacy, or social network characteristics may simultaneously shape both exclusion and informal borrowing patterns.

Interestingly, Financial Inclusion is also positively associated with Informal Debt Dependence, a finding that runs counter to the common assumption that expanding formal financial access necessarily displaces informal borrowing. This positive association is better understood through the lens of financial complementarity rather than substitution. Individuals who hold bank accounts or use digital payment services may encounter formal credit products that are nonetheless misaligned with their actual financing needs: loan amounts may be too large, repayment schedules too rigid, or approval timelines too slow for urgent or small-scale needs. In such cases, informal sources characterised by immediacy, flexibility, and relational trust continue to serve functions that formal institutions do not fully replicate (Giraldo et al., 2024; Kamran & Uusitalo, 2024). The positive association thus reflects a pattern of layered or parallel financing rather than a failure of financial inclusion per se. It also raises the question of inclusion depth: access to basic financial services may coexist with unmet needs that sustain informal borrowing, whereas deeper inclusion encompassing affordable credit, tailored products, and financial literacy might exhibit a different relationship with informal debt dependence. This distinction warrants attention in future research.

The significant moderating association involving Financial Inclusion on the relationship between Distance to Bank and Informal Debt Dependence provides an important additional finding. The negative interaction coefficient ($\beta = -0.262$, $p = .001$) indicates that the positive association between geographical distance and informal debt dependence is weaker among individuals with higher levels of financial inclusion. A plausible explanation is that digitally or agentically included individuals have access to alternative service channels such as mobile banking, banking agents, and digital payment platforms that reduce the practical relevance of physical proximity to a bank branch. In other words, financial inclusion may attenuate the access penalty imposed by geographical distance by providing non-branch pathways to formal financial services. This pattern is consistent with the view that digital financial infrastructure can partially substitute for physical branch networks in underserved areas (Ediagbonya & Tioluwani, 2023). As with the direct associations discussed above, the cross-sectional design means this remains an observed pattern of association rather than a confirmed causal mechanism.

However, Financial Inclusion does not significantly moderate the association between Financial Exclusion and Informal Debt Dependence ($\beta = 0.087$, $p = .213$). This non-significant interaction warrants substantive interpretation rather than dismissal. Financial exclusion, as

operationalised in this study, captures structural and institutional barriers such as the absence of accounts, credit access difficulties, and administrative obstacles that are qualitatively different from the geographical barriers addressed in H4. Whereas digital or agent-based inclusion can plausibly compensate for physical distance, it may be insufficient to override deeper institutional exclusion. An individual may simultaneously possess a mobile banking account and remain unable to obtain formal credit due to income informality, lack of collateral, or credit history gaps. In this context, the form of inclusion available to many respondents may not extend to the specific dimensions of formal finance, particularly credit, that would be required to displace informal debt dependence rooted in exclusion. This interpretation echoes the distinction between access to financial services and genuine financial integration (Kling et al., 2022; Rojas Cama et al., 2024), and suggests that inclusion efforts targeting exclusion-driven informal borrowing must move beyond expanding basic account ownership toward ensuring accessible and appropriate formal credit.

Taken together, the findings suggest that informal debt dependence is associated with multiple, intersecting dimensions of financial access. Geographical distance and financial exclusion are each positively associated with informal borrowing, while financial inclusion coexists with rather than displacing informal debt. Financial inclusion is associated with a buffering pattern in the context of geographical barriers but not in the context of structural financial exclusion. These associations collectively suggest that policy efforts to reduce informal debt dependence cannot rely on a single lever. Expanding digital and agent-based financial access may help attenuate the influence of geographical barriers, but addressing exclusion-driven informal borrowing will likely require deeper interventions: more accessible formal credit products, reduced administrative burdens, and stronger alignment between formal financial offerings and the actual financing needs of underserved populations.

CONCLUSION

This study examined the associations of Financial Exclusion and Distance to Bank with Informal Debt Dependence and tested Financial Inclusion as a moderator among respondents in Central Java, Indonesia. H1, H2, and H3 were supported: Distance to Bank ($\beta = 0.367$, $p < .001$), Financial Exclusion ($\beta = 0.286$, $p = .004$), and Financial Inclusion ($\beta = 0.229$, $p = .015$) each had a positive and statistically significant association with Informal Debt Dependence. H4 was supported because the Distance to Bank $\times$ Financial Inclusion interaction was negative and significant ($\beta = -0.262$, $p = .001$). H5 was not supported because the Financial Exclusion $\times$ Financial Inclusion interaction was not significant ($\beta = 0.087$, $p = .213$). These findings suggest that financial inclusion may buffer the association between geographical distance and informal debt dependence, but the study does not establish causal effects.

For policy and practice, financial institutions and local authorities could prioritize underserved districts where travel to branches is costly, expand reliable banking-agent and digital service access, and provide practical assistance for people who have difficulty using digital services. Formal lenders could also review documentation requirements and develop transparent, affordable credit products suited to borrowers with irregular or modest incomes. Such measures should be accompanied by consumer-protection safeguards and clear information about total borrowing costs. Future research should use broader or probability-based samples where feasible, report respondent characteristics and recruitment procedures, and consider longitudinal data and additional factors such as income, financial literacy, financial resilience, and digital financial inclusion.

REFERENCES

- Ali, J., & Ghildiyal, A. K. (2023). Socio-economic characteristics, mobile phone ownership and banking behaviour of individuals as determinants of digital financial inclusion in India. *International Journal of Social Economics*, 50(10), 1375–1392.
- Ambarkhane, D., Singh, A. S., Venkataramani, B., & Marak, Z. (2022). Overcoming barriers to financial inclusion: empirical evidence from India. *International Journal of Social Economics*, 49(9), 1302–1323.
- Anakpo, G., Xhate, Z., & Mishi, S. (2023). *The Policies , Practices , and Challenges of Digital Financial Inclusion for Sustainable Development : The Case of the Developing Economy*. 327–343.
- Anyangwe, T., Vanroose, A., & Fanta, A. (2022). Determinants of financial inclusion: does culture matter? *Cogent Economics & Finance*, 10(1), 2073656.
- Bekele, W. D. (2023). Determinants of financial inclusion: A comparative study of Kenya and Ethiopia. *Journal of African Business*, 24(2), 301–319.
- Chylakova, V., & Hunady, J. (2026). *Digital Financial Exclusion in the EU : Socio- Economic Determinants and Inclusion Effects*. 23(1), 39–50. <https://doi.org/10.2478/jec-2026-0004>
- Dabla-norris, E., Deng, Y., Ivanova, A., & Karpowicz, I. (2015). *Financial Inclusion : Zooming in on Latin America*.
- Danladi, S., Prasad, M. S. V, Modibbo, U. M., Ahmadi, S. A., & Ghasemi, P. (2023). Attaining sustainable development goals through financial inclusion: exploring collaborative approaches to Fintech adoption in developing economies. *Sustainability*, 15(17), 13039.
- Ediagbonya, V., & Tioluwani, C. (2023). The role of fintech in driving financial inclusion in developing and emerging markets: issues, challenges and prospects. *Technological Sustainability*, 2(1), 100–119. <https://doi.org/10.1108/TECHS-10-2021-0017>
- Ezzahid, E., & Elouaourti, Z. (2021). Financial inclusion, mobile banking, informal finance and financial exclusion: micro-level evidence from Morocco. *International Journal of Social Economics*, 48(7), 1060–1086. <https://doi.org/https://doi.org/10.1108/IJSE-11-2020-0747>
- Geraldes, H. S. A., Gama, A. P. M., & Augusto, M. (2022). Reaching financial inclusion: Necessary and sufficient conditions. *Social Indicators Research*, 162(2), 599–617.
- Giraldo, M., Sanchez Barrios, L. J., Rayburn, S. W., & Sierra, J. J. (2024). Low-income consumers' informal and formal financial service experiences: perceptions of access, inclusion, and social dependence. *Journal of Services Marketing*, 38(8), 994–1011.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Evaluation of Formative Measurement Models*. https://doi.org/10.1007/978-3-030-80519-7_5
- Hemvanich, S., & Chanchaoenchai, K. (2025). *Credit Segmentation and Household Vulnerability in Thailand : Formal Versus Informal Debt Risks*. 2019.
- Hoagland, P. A., & Kipping, C. C. S. (2024). Challenges in promoting health equity and reducing disparities in access across new and established technologies. *Canadian Journal of Cardiology*, 40(6), 1154–1167.
- Jama, A., Eshetu, F., & Ali, H. (2025). Drivers of financial inclusion in sub-Saharan Africa countries. *Cogent Social Sciences*, 11(1). <https://doi.org/10.1080/23311886.2025.2590235>
- Jatav, S. S., & Nayak, S. (2022). Access and determinants of formal agriculture credit in Uttar Pradesh, India. *Journal of Rural Development*, 185–197.
- Kadir, R. D., Tri Wahyudi, S., Maski, G., & Devia Sagita Sumantri, V. (2025). The role of financial inclusion in reducing household poverty: insights from Eastern Indonesia. *Cogent*

- Economics & Finance*, 13(1), 2588925. <https://doi.org/10.1080/23322039.2025.2588925>
- Kamran, S., & Uusitalo, O. (2024). How informal financial service institutes facilitate the financial inclusion of low-income, unbanked consumers. *International Journal of Bank Marketing*, 42(6), 1232–1263.
- Kementerian Koordinator Bidang Perekonomian. (2025). *Panduan Nasional Inklusi Keuangan Meningkatkan Kesejahteraan Kelompok Sasaran Kajian Asesmen Program Edukasi dan Literasi Keuangan Digital sesuai dengan Core Competencies Meningkatkan Kesejahteraan Kelompok Sasaran Kajian Asesmen Program Edukasi dan Literasi*.
- Kementerian Koordinator Bidang Perekonomian. (2026). *Tingkatkan Literasi dan Inklusi Keuangan, Pemerintah Siapkan Layanan Rekening dan Integrasi QRIS Bagi Masyarakat*.
- Kling, G., Pesqué-Cela, V., Tian, L., & Luo, D. (2022). A theory of financial inclusion and income inequality. *The European Journal of Finance*, 28(1), 137–157. <https://doi.org/10.1080/1351847X.2020.1792960>
- Kyeyune, G. N., & Ntayi, J. M. (2025). Empowering rural communities: the role of financial literacy and management in sustainable development. *Frontiers in Human Dynamics*, 6, 1424126.
- Liu, Y., Li, H., & Fang, X. (2024). Who should the elderly borrow money from under formal financial exclusion? Evidence from China. *Economic Analysis and Policy*, 81, 964–982. <https://doi.org/https://doi.org/10.1016/j.eap.2024.01.012>
- Long, M. G. (2020). Informal Borrowers and Financial Exclusion: The Invisible Unbanked at the Intersections of Race and Gender. *The Review of Black Political Economy*, 47(4), 363–403. <https://doi.org/10.1177/0034644620938620>
- Mahmud, K., Joarder, M. A., & Muheymin-us-sakib, K. (2023). *Adoption Factors of FinTech : Evidence from an Emerging Economy Country-Wide Representative Sample*.
- Makmur, K. L. (2024). Why only scrutinise formal finance? Money laundering and informal remittance regulations in Indonesia. *Journal of Economic Criminology*, 6, 100111.
- Manja, L. P., & Badjie, I. A. (2022). The welfare effects of formal and informal financial access in the Gambia: A comparative assessment. *Sage Open*, 12(1), 21582440221081110.
- Manzilati, A., & Prestianawati, S. A. (2021). Informal financing or debt traps: are the UN sustainable development goals being met in emerging economies? *Review of International Business and Strategy*, 32(1), 132–145. <https://doi.org/10.1108/RIBS-01-2021-0011>
- Mbodj, A., & Laye, S. (2025). Reducing poverty through financial growth: The impact of financial inclusion and development in emerging economies. *Journal of Business and Economic Options*, 8(1), 61–76.
- Mishra, A. K., & Bhardwaj, V. (2022). Financial access and household's borrowing: Policy perspectives of an emerging economy. *Journal of Policy Modeling*, 44(5), 981–999. <https://doi.org/https://doi.org/10.1016/j.jpolmod.2022.09.018>
- Mishra, D., Kandpal, V., Agarwal, N., & Srivastava, B. (2024). *Financial Inclusion and Its Ripple Effects on Socio-Economic Development : A Comprehensive Review*.
- Mpofu, O., & Sibindi, A. B. (2022). Informal finance: a boon or bane for African SMEs? *Journal of Risk and Financial Management*, 15(6), 270.
- Onyishi, C. N., Igbo, E. U. M., & Uwakwe, E. E. (2022). Surviving amidst barriers: Community based organizations and rural farmers' access to informal credit in Southeast Nigeria. *Local Development & Society*, 3(2), 187–203.
- Rehman, M. A., Ahmed, M., & Sethi, S. (2025). AI-based credit scoring models in microfinance: improving loan accessibility, risk assessment, and financial inclusion. *The Critical Review of*

- Social Sciences Studies*, 3(1), 2997–3033.
- Rojas Cama, F., Emara, N., & Trabelsi, M. (2024). Financial inclusion and the informal sector. *Research in International Business and Finance*, 70, 102379. <https://doi.org/https://doi.org/10.1016/j.ribaf.2024.102379>
- Roscoe, J. (1975). *Fundamental research statistics for the behavioral science* (R. and W. Holt (ed.)).
- Sethy, S. K., Mir, T. A., Gopinathan, R., & Joshi, D. P. P. (2023). Exploring the socio-economic attributes of financial inclusion in India: a decomposition analysis. *International Journal of Social Economics*, 50(7), 941–955.
- Sikka, V., & Bhayana, P. (2024). Barriers to comprehensive financial inclusion across the globe: From sociocultural norms to systemic challenges. In *E-Financial strategies for advancing sustainable development: Fostering financial inclusion and alleviating poverty* (pp. 89–126). Springer.
- Simba, A., Tajeddin, M., Dana, L.-P., & Ribeiro Soriano, D. E. (2024). Deconstructing involuntary financial exclusion: a focus on African SMEs: A. Simba et al. *Small Business Economics*, 62(1), 285–305.
- Sripakdeevong, P., & Townsend, R. M. (2022). The village money market revealed: Financial access and credit chain links between formal and informal sectors. *Annual Review of Financial Economics*, 14(1), 1–20.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393–410.
- Tran Pham, T. K., & Nguyen Le, Q. H. T. T. (2024). Does public debt moderate government spending–informal economy nexus? Evidence from the Asian countries. *International Journal of Sociology and Social Policy*, 44(7–8), 629–642.
- Turkson, F. E., Amissah, E., & Gyeke-Dako, A. (2022). The role of formal and informal finance in the informal sector in Ghana. *Journal of Small Business & Entrepreneurship*, 34(3), 333–356.
- Ullah, A., Verner, V., Madaki, M. Y., Adams, F., & Bavorova, M. (2024). Factors influencing informal credit access and utilization among smallholder farmers: Insights from Mountainous regions of Pakistan. *Agriculture*, 14(10), 1764.
- Valera, M. L. G., Lei, Z., & Fong, J. H. (2025). Determinants of financial inclusion in Southeast Asia. *Applied Economics*, 57(20), 2533–2550.
- Van Leuven, A. J., Lambert, D., Conroy, T., & Thomas, K. L. (2024). Do “banking deserts” even exist? Examining access to brick-and-mortar financial institutions in the continental United States. *Applied Geography*, 165, 103201.
- van Zanden, J. L. (2023). Examining the relationship of information and communication technology and financial access in Africa. *Journal of Business and Economic Options*, 6(3), 26–36.
- Yadav, R. S., & Siva Reddy, K. (2023). Banking or under-banking: spatial role of financial inclusion and exclusion. *International Journal of Rural Management*, 19(1), 7–25.