ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue X October 2025

Determinants of Access to Formal Financial Services among Rural Farmers in Ethiopia: A Meta-Analysis

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DOI: https://doi.org/10.51244/IJRSI.2025.1210000109

Received: 02 October 2025; Accepted: 10 October 2025; Published: 06 November 2025

ABSTRACT

Financial inclusion is a cornerstone of inclusive development, especially in rural economies where access to formal financial services remains limited. In Ethiopia, smallholder farmers face persistent barriers to financial inclusion despite national strategies aimed at improving their financial access. While numerous empirical studies have explored these determinants, findings remain fragmented and inconclusive. This study aims to systematically synthesize empirical evidence on the determinants of access to formal financial services among rural farmers in Ethiopia through meta-analysis. A systematic review and meta-analysis were conducted following PRISMA guidelines. The study draws upon a rich body of literature published between 2010 and 2024, resulting in 18 eligible studies, which employed logit model to assess determinants. Effect sizes were extracted and pooled using a random-effects model to account for heterogeneity. Meta-regression was performed to identify moderators of variation in effect sizes. The meta-analysis revealed income, financial literacy, and credit experience as positive and statistically significant determinants of access to formal financial services. Other commonly studied variables such as gender, education, and distance to financial institutions showed non-significant pooled effects. Meta-regression revealed that sample size and financial inclusion measure significantly moderated the effect of income, while region and publication year did not. Rural financial inclusion in Ethiopia is significantly influenced by income level, financial literacy, and prior credit experience. These findings highlight the need for targeted interventions that promote income generation, financial education, and access to introductory credit schemes. Standardizing financial inclusion metrics and improving geographic study coverage are essential for future research and policy formulation.

Keywords: Financial inclusion, rural Ethiopia, meta-analysis, systematic review, financial literacy, credit access

INTRODUCTION

Financial inclusion has emerged as a global development priority, recognized for its critical role in promoting economic growth, poverty reduction, and social equity (World Bank, 2022). Access to affordable and reliable financial services empower individuals to save, invest, and manage risks effectively, thus contributing to inclusive development. Globally, the United Nations' Sustainable Development Goals (SDG 1, SDG 8, and SDG 10) emphasize financial inclusion as a key enabler of poverty eradication, decent work, and reduced inequalities. SDG 16 further highlights the importance of inclusive institutions and governance in ensuring access to finance for all (UN, 2015).

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In Africa, Agenda 2063 underscores inclusive finance as central to achieving structural transformation and sustainable livelihoods (African Union Commission, 2015). Reflecting this Ethiopia's National Financial Inclusion Strategy (NFIS 2021–2025) aims to significantly expand access to formal financial services by 2025 (National Bank of Ethiopia, 2021). Despite this national commitment, substantial disparities persist, with over 80% of the population residing in rural areas experiencing limited access to credit, savings, and insurance, particularly for smallholder farmers (CSA, 2021). This exclusion is exacerbated by the dominance of informal finance, underdeveloped institutional structures, and low financial literacy (Abebe & Bekele, 2020). The NFIS explicitly addresses these challenges by prioritizing rural outreach, advancing digital financial services, strengthening institutional capacity, and enhancing financial literacy, especially within underserved rural communities where formal institutions are scarce (National Bank of Ethiopia, 2021).

Ethiopia's rural economy is heavily reliant on smallholder farmers, who are central to national food security and rural livelihoods (Neglo *et. al.*, 2021). However, these farmers consistently encounter barriers to financial access, including geographical isolation, lack of collateral, low education and financial literacy levels, and underdeveloped institutional networks. As a result, rural households are often unable to invest in productivity-enhancing technologies, manage risks, or shift from subsistence to market-oriented agriculture. Despite national strategies aimed at improving financial inclusion, persistent structural obstacles continue to limit rural populations' engagement with formal financial institutions, thereby constraining agricultural transformation and broader rural development (Anderson *et. al.*, 2016). In Ethiopia, the share of banking loans directed to the agricultural sector remains notably low, accounting for only 6.4% in 2023 and further declining to 6.3% in 2024. This persistent underfunding highlights the limited access to formal credit faced by the agricultural sector, which may constrain its growth and development.

While various studies have explored the determinants of financial inclusion in rural areas, the findings are fragmented and context-specific, often lacking coherence across different regions and populations. Moreover, there is limited synthesized evidence that systematically evaluates which factors consistently influence rural financial inclusion across Ethiopia. This makes it hard to assess the collective evidence on determinants of financial inclusion in rural areas in one particular research. This is why the literature review as a research method is more relevant than ever. A literature review can broadly be described as a more or less systematic way of collecting and synthesizing previous research (Webster and Watson, 2002). This particular study aimed at reviewing previous researches on determinants of financial inclusion.

Previous studies have investigated various determinants of financial inclusion, such as income, education, gender, distance to financial institutions, and trust (Tamane et al., 2024; Ayele, 2021; Moyo & Musakwa, 2019). However, the evidence remains fragmented, often based on small samples and diverse methodologies. This limits the ability to draw generalizable conclusions. Meta-analytical research focusing on financial inclusion in Ethiopia remains limited. In particular, there is a paucity of studies that systematically investigate the determinants of access to financial services in Ethiopian context. Thus, a systematic synthesis through meta-analysis is essential to quantify the magnitude and direction of these determinants and identify key drivers of access to formal financial services among rural farmers in Ethiopia.

The above knowledge gaps could prevent policy makers from drafting evidence-based strategies to address rural financial exclusion. Therefore, a systematic review and meta-analysis like the present on determinants of financial inclusion is justified study, to support evidence based policy making.

THEORETICAL FRAMEWORK

Credit Market Failures and Rural Financial Access

The access of smallholder farmers to finance is often constrained not merely by supply and demand, but by structural inefficiencies inherent in rural credit markets. In this regard, the Credit Rationing Theory formulated by Stiglitz and Weiss (1981) offers a foundational explanation. According to this theory, financial institutions may rationally limit credit supply to rural borrowers, even when these individuals are willing to pay higher interest rates. The core issue lies in Asymmetric information and the associated moral hazard, implying that lenders cannot fully assess the risk profile of individual borrowers due to inadequate documentation, informal

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land ownership, and lack of credit history, all of which are typical in rural Ethiopia. As a result, lenders prefer to ration credit rather than risk defaults, especially in the absence of viable collateral. This condition is further compounded by the Transaction Cost Theory, which highlights that high costs related to screening, monitoring, and enforcing loan contracts in dispersed and infrastructure-poor rural settings discourage formal financial institutions from extending credit to smallholder farmers (Binswanger & Rosenzweig, 1986). Moreover, agriculture is a risky business associated with many uncertainties such as climatic, market failures and pest outbreaks, which discourage lenders. These factors could contribute to persistent exclusion of rural populations from formal financial systems.

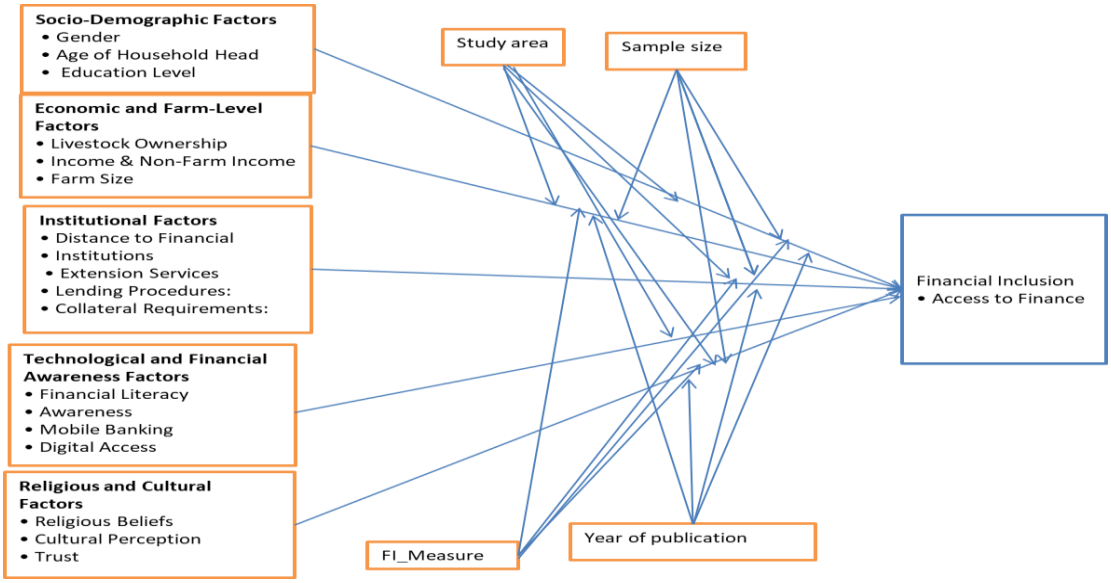
Institutional and Socio-Cultural Determinants

While economic theories address the mechanics of credit markets, they often underplay the broader institutional and socio-cultural dimensions of financial access. The New Institutional Economics perspective, particularly the work of North (1990), emphasizes that both formal institutions (such as legal frameworks, banking regulations, and financial infrastructure) and informal institutions (such as religious beliefs, social norms, and community trust) can significantly shape economic behaviors. In the Ethiopian rural context, informal institutions play critical roles. For instance, cultural norms related to gender often limit women's control over assets, decision-making power, and thus their eligibility for credit even though women are central to agricultural labor. Similarly, in Islam religion, conventional interest-based loans is viewed as incompatible with Sharia law, which prohibits riba (interest), creating difficulties in accessing credit from formal financial institutions (World Bank, 2014). These constraints of informal institutions brought innovations in financial institutions such as Islamic finance, group lending models, and community-based savings associations that align with local cultural and religious values. Ultimately, a purely market-based understanding alone is insufficient. Hence, any effort to expand financial inclusion must consider the layered interaction of formal and informal institutions

Conceptual framework

This conceptual framework, derived from synthesized empirical literature, categorizes the determinants of financial inclusion among rural Ethiopian farmers into five domains: Socio-Demographic, Economic/Farm-Level, Institutional, Technological/Financial Awareness, and Religious/Cultural factors. The framework posits that these relationships are moderated by Sample Size, Publication Year, Operationalization of Financial Inclusion (Financial inclusion Measure), and Region, acknowledging both socioeconomic context and methodological variance. Financial inclusion is operationalized as access to formal finance, recognizing its multi-dimensional nature.

Figure 1 Conceptual Framework of Determinants Influencing Access to Formal Financial Services



Source: Author's computation from Literature review (2024).

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METHODOLOGY

Research Design

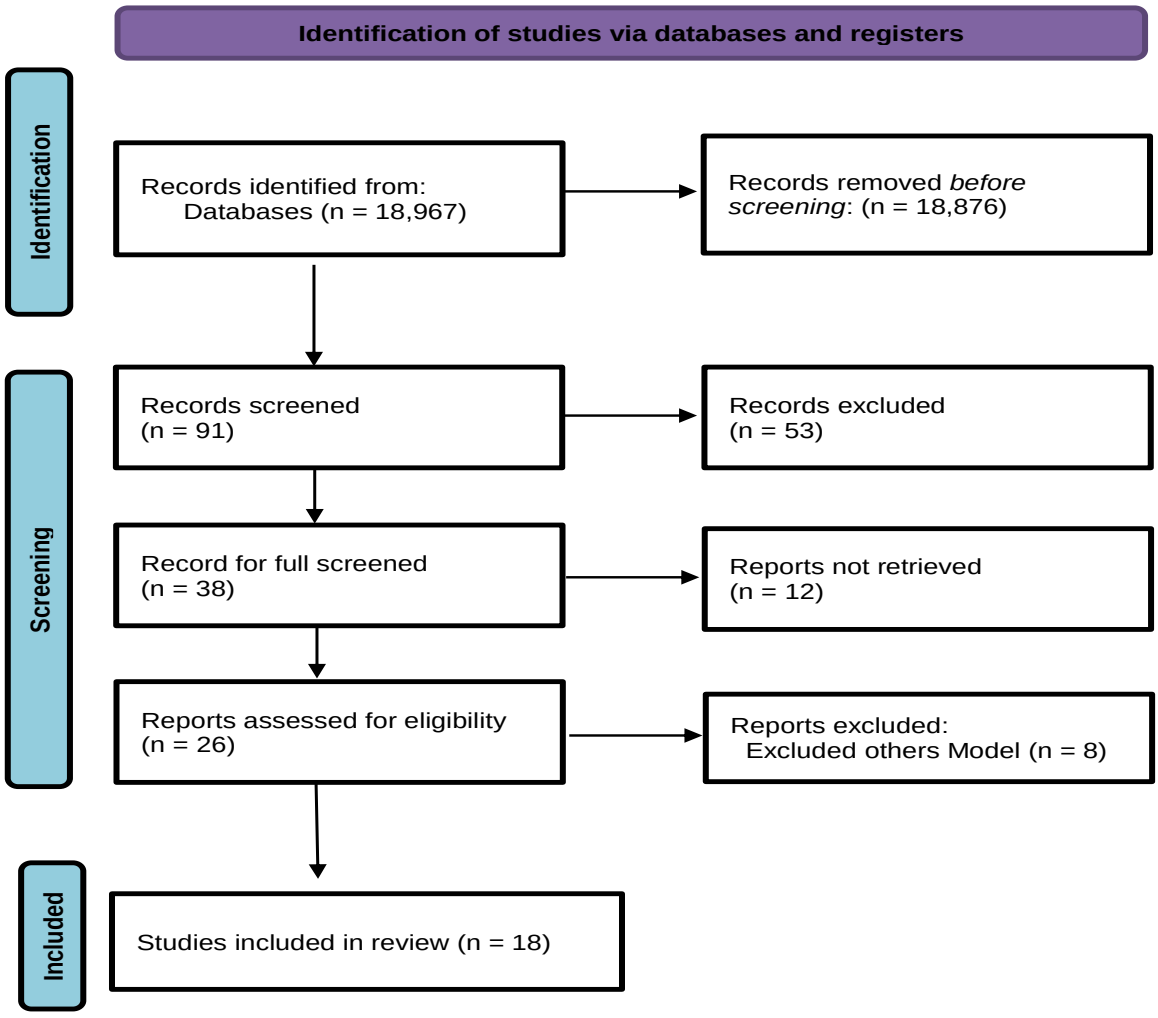
This study employed a systematic review and meta-analysis approach to synthesize empirical evidence on the determinants of financial inclusion in rural Ethiopia. The methodology was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards, ensuring transparency, replicability, and comprehensiveness in identifying and analyzing relevant studies.

Data Sources and Search Strategy

The literature search was conducted using Google Scholar, Science Direct, Scopus, JSTOR, DOAJ, Web of Science, and Articles via Snowballing, the study draws upon a rich body of literature published between 2010 and 2024. A combination of search terms was applied, including: “financial inclusion”, “access to credit”, “determinants”, “rural Ethiopia”("financial inclusion" OR "access to finance") AND ("determinants" OR "factors") AND ("rural" OR "farmers") AND "Ethiopia".

The initial search returned approximately 18,967 articles. After preliminary screening based on title and abstract relevance, 91 studies were recorded for full-text review. After screening the abstract, 38 studies were identified as potentially suitable for inclusion in the review. Ultimately, 26 studies were fully included. However, after removing the 8 studies that used the probit model the final dataset comprised 18 studies for analysis.

Figure 2 PRISMA 2025 flow diagram for selecting studies



Source: Author’s computation (2024).

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Inclusion and Exclusion Criteria

The inclusion criteria were as follows:

- Studies conducted in Ethiopia, specifically focusing on rural areas or including rural samples.
- Empirical research using quantitative econometric analysis.
- This systematic review included studies using Logit models to estimate the determinants of financial inclusion, focusing on the interpretable odds ratios derived from these models, while excluding studies lacking sufficient data for a robust odds ratio analysis or employing alternative models with inherently different coefficient interpretations.
- Reporting of effect size coefficients with associated standard errors.

The following studies were excluded:

- Studies using others models as their output format were incompatible with the meta-analytic synthesis in this study.
- Conceptual or qualitative studies.
- Studies with insufficient statistical data for meta-analysis.

Data Extraction and Coding

From each eligible study, the following data were extracted and compiled into a structured dataset:

Study characteristics: Author(s), year, region, sample size, and financial inclusion measure. Econometric model used (logit).

Determinants of financial inclusion: variable names, operational definitions, and effect sizes.

Statistical details: coefficient (β), standard error (SE), and p-values.

All coefficients were coded in a consistent format and transformed where necessary to maintain comparability. When studies reported multiple determinants, each was treated as a separate data point.

Model Specification

This study employed a random-effects meta-analysis to synthesize the effect sizes of determinants of financial inclusion across multiple studies. The random-effects model assumes that the true effect size may vary from study to study due to contextual, methodological, or population differences, which is appropriate given the heterogeneity observed across studies in Ethiopia.

The meta-analytic model is specified as follows:

$\theta_i = \theta + u_i + \varepsilon_i$

Where:

θ_i is the observed effect size coefficient estimate β from study *i*,

θ is the overall true average effect across studies,

$u_i \sim N(0, \tau^2)$ is the between-study random effect (capturing heterogeneity),

$\varepsilon_i \sim N(0, v_i)$ is the within-study sampling error, where v_i is the variance (typically SE^2).

Each study's contribution to the pooled estimate is inversely weighted by its total variance, $(v_i + \tau^2)$. The between-study variance τ^2 was estimated using the Restricted Maximum Likelihood (REML) method.

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In operational terms, for each determinant *j*, the model estimated a pooled effect size $\hat{\theta}_J$ and its corresponding 95% confidence interval:

$\hat{\theta}_J = \sum(w_i \theta_i) / \sum w_i$

Where $w_i = 1 / (v_i + \tau^2)$ is the weight assigned to each study, and *k* is the number of studies reporting on determinant *j*.

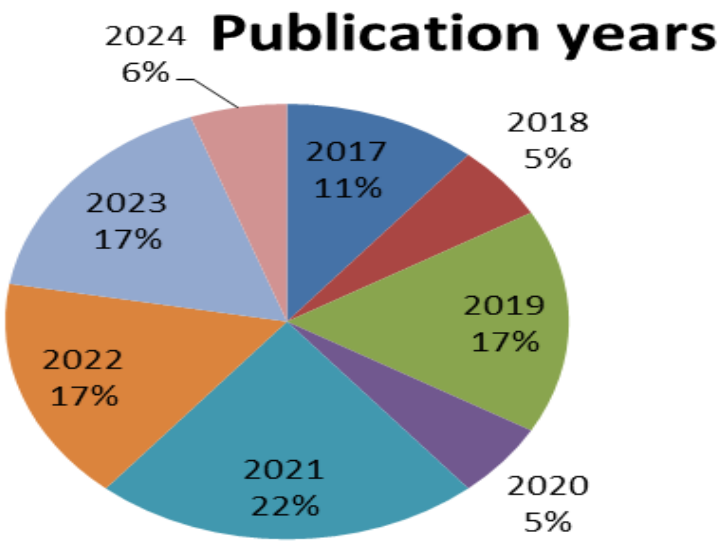
A random-effects meta-analysis model was applied using the meta for package in R, as recommended by Borenstein et al. (2009). This approach accounts for both within-study and between-study variability, which is appropriate given the heterogeneity in sample sizes, geographic focus, and variable measurement across studies. Forest plots were generated to visualize the individual and pooled estimates for each determinant. Determinants with fewer than three effect sizes were excluded from the pooled estimation due to statistical unreliability. Heterogeneity across studies was assessed using the I^2 statistic, which quantifies the proportion of total variation due to heterogeneity rather than chance. Effect sizes and standard errors were used to estimate pooled coefficients for each determinant. Heterogeneity was assessed using the I^2 statistic, and 95% confidence intervals were calculated for each pooled estimate. Determinants reported by fewer than three studies were excluded from pooled analysis due to statistical limitations.

RESULTS

Overview of The Included Studies

The included studies span various rural regions of Ethiopia, such as zones, Woredas (districts), and regions, conducted between 2017 and 2024. These studies spanned from 2017 to 2024, reflecting an increasing academic interest in the determinants of financial inclusion over recent years. The highest number of studies were conducted in 2021 (n =22%), followed by 2017 (n = 11%), 2022 and 2023 (each n = 17%), and 2019 (n = 17%). Fewer studies were recorded in 2020 (n = 5%) and 2024 (n = 5%). This temporal distribution suggests a growing body of evidence over time, with a concentration of research occurring in the last five years (Figure 3).

Figure 4 Year of publications



Source: Author's computation from article collected (2024).

A total of 18 studies were included in this meta-analysis, spanning multiple regions and years. The majority of studies were conducted in the Oromia and Amara regions, each contributing eight studies, while the Afar and Southern Regions accounted for one and three studies, respectively, suggesting potential gaps in geographic coverage that future studies could address(Figure 5).

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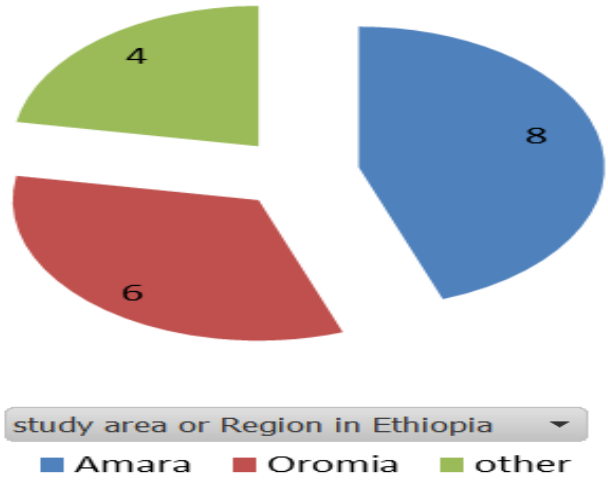
Figure 6 Studies by regions



Source: Author's computation from article collected (2024).

Each study contributed one or more effect sizes related to different determinants of financial inclusion. The determinants examined include demographic factors: age, gender, marital status, socio-economic factors: education, income, family size, and institutional/structural variables: distance to financial institutions, trust, financial literacy, infrastructure.

The studies included in this meta-analysis utilized several key indicators to assess financial inclusion among rural populations. The most frequently used indicator was access to credit, which was examined in 13 studies, highlighting its central role in understanding financial inclusion in the rural context. Other indicators included access to a financial institution (1 study), account ownership (3 studies), and saving behavior (1 study). This distribution suggests that while access to credit remains the primary focus in the literature, other important dimensions of financial inclusion, such as formal account ownership and savings, are less frequently explored, indicating areas for further research. The sample sizes ranged from 100 to 414, with a wide array of financial inclusion measures, including access to bank accounts, use of formal credit, and usage of microfinance services (Table 1).

Table 2 Sample size of the studies

Row Labels	Sample Size
Access to account	**968**
Amara	**200**
Teka et al.	200
Oromia	**384**
Tamene et al.	384
other	**384**
Abdu & Adem	384
Access to credit	**3902**
Amara	**2152**
Abreu Yirdaw Bezabih	396
Aliy Seid Mohammed	375
Dagnachew et al.	365
Kiros & Meshesha	299
SISAY GENANU	250
Tesfaye & Worku	329
Woleteyes Mamuye	138
Oromia	**900**
Aknaw Borena	200
Deresse, & Zerihum	400
Tura et al.	300
other	**850**
Kayamo & Ayele	365
Dula et al.	100
Tesiso et al.	385
Access to Saving	**157**
Oromia	**157**
Mazengiya et al.	157
microfinance users	**414**
Oromia	**414**
Duga et al.	414
Grand Total	**5441**

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Pooled Effects of Key Determinants

A random-effects meta-analysis was conducted to estimate the pooled effects of determinants on financial inclusion. Table 2 below summarizes the results, including the number of studies (k) contributing to each determinant, the pooled coefficient (β), the 95% confidence interval, statistical significance (p-value), and the heterogeneitystatistic (I^2).

Meta-Analysis Results of Determinants of Financial Inclusion

Table 2: Pooled Effect Sizes of Determinants of Financial Inclusion (Meta-Analysis)

Determinant	K	Pooled Beta	CI Lower	CI Upper	P value
Gender	15	0.2405	-0.1482	0.6293	0.2252
Age	16	0.0929	-0.066	0.2518	0.2519
Education	10	0.7494	-0.1722	1.671	0.111
Income	10	0.9281	0.0044	1.8518	0.0489
Distance	15	-0.5446	-1.5006	0.4114	0.2642
Literacy	5	0.9641	-0.1083	2.0365	0.0781
Extension	7	0.4425	-0.2103	1.0952	0.184
Lending Procedure	6	-0.3573	-2.1899	1.4754	0.7024
Religion	6	-0.2751	-1.5971	1.0468	0.6833
Farm size	12	0.0949	-0.551	0.7407	0.7734
Livestock	10	0.1226	-0.0921	0.3374	0.263
Experience	7	1.1072	0.1042	2.1101	0.0305
Family size	8	0.0292	-0.5887	0.6471	0.9263
Interest rate	7	-0.464	-1.1582	0.2302	0.1902
Marital	5	0.632	-1.5696	2.8336	0.5737

The meta-analysis evaluated the pooled effect sizes (β coefficients) of multiple determinants on rural financial inclusion across 18 studies. Among the 15 tested predictors, three variables showed statistically significant associations with financial inclusion at the 10% level including Income, Literacy, and Experience.

Income

Income consistently emerged as a strong predictor of financial inclusion. The pooled effect size (β = 0.93, 95% CI [0.004, 1.85], p = .049) indicates that households with higher income are significantly more likely to participate in the formal financial sector. This finding aligns with earlier micro-level studies, which demonstrated that income positively influences both credit uptake and savings behavior in rural Ethiopia (Gebeyehu *et. al.*, 2019; Giday, 2023). However, the heterogeneity statistic (I^2 = 100%) underscores considerable variation across studies, likely reflecting differences in regional economic structures and methodological approaches.

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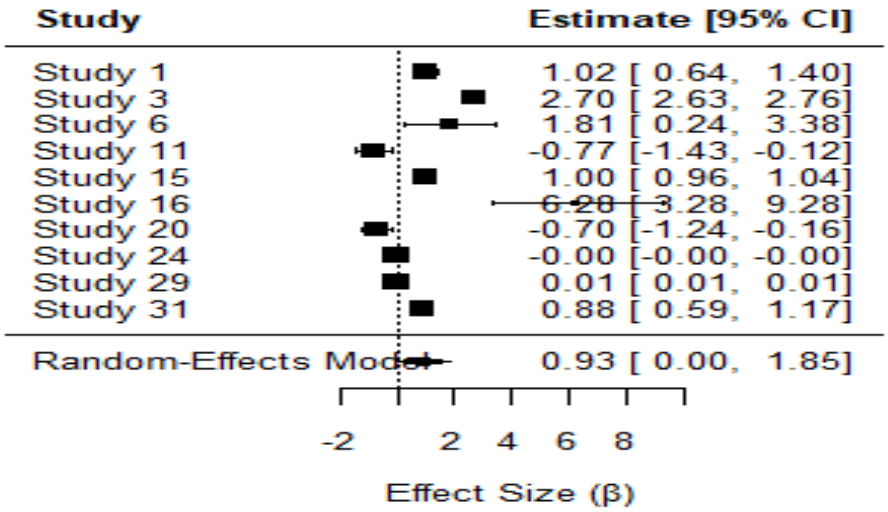
Figure 7 Forest plot for determinants: income

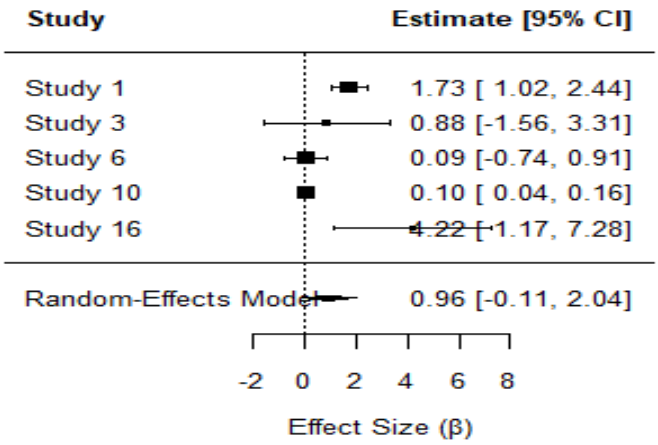


Source: Author's computation from meta-analysis (2024).

Financial Literacy

Financial literacy was also positively associated with financial inclusion (β = 0.96, 95% CI [–0.11, 2.04], p = .078). Though marginally significant at the 10% level, the evidence suggests that households with higher awareness of financial products and institutions are more likely to adopt formal services. This supports the argument advanced by Dagnachew and Mawugatie (2022) and Tesiso *et al.* (2023) that literacy is not only a cognitive skill but a behavioral determinant that shapes saving, borrowing, and repayment practices. Notably, heterogeneity remained high (I^2 = 88%), implying that the influence of literacy may differ depending on local education infrastructure and the presence of financial education programs.

Figure 8 Forest plot for determinants: Literacy



Source: Author's computation from meta-analysis (2024).

Experience

Experience with credit use showed a significant and positive impact (β = 1.11, 95% CI [0.10, 2.11], p = .031), highlighting the role of prior borrowing history in shaping access to formal financial institutions. Farmers with previous credit participation are more likely to re-engage with financial services, a finding consistent with Waje (2020) and Mamuye (2021). The effect likely stems from increased familiarity, reduced transaction costs, and the establishment of trust with lenders. Nonetheless, heterogeneity was substantial (I^2 = 98.6%), suggesting contextual variation across institutional settings and product types.

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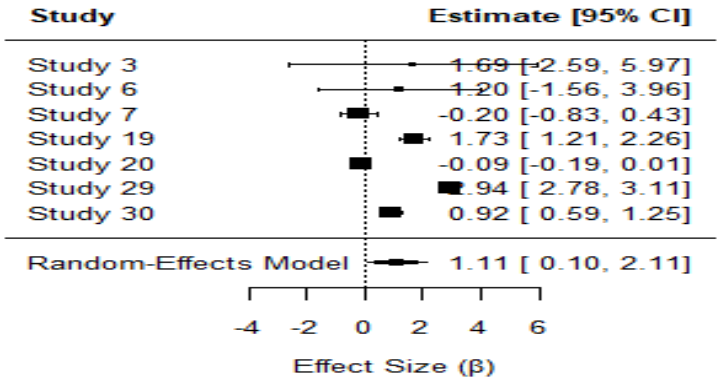
Figure 9 Forest plot for determinants: Experience



Source: Author's computation from meta-analysis (2024).

In contrast, other frequently studied variables including gender, age, education, distance, extension services, farm size, and livestock ownership are not statistically significant ($p > .10$). These findings suggest that demographic and farm-level factors alone may not determine financial inclusion outcomes once income, literacy, and financial behavior are considered, echoing earlier observations by Kiros and Meshesha (2022).

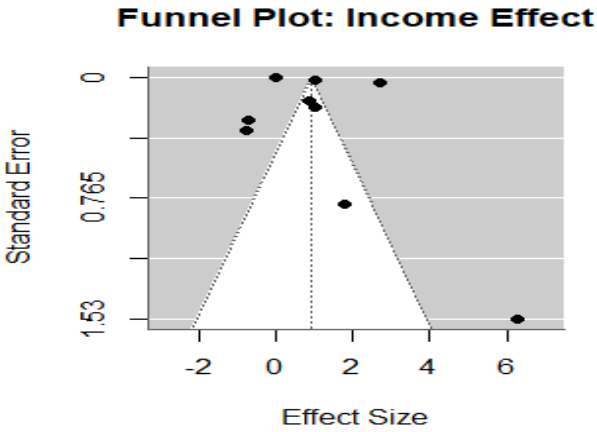
Meta-Regression Results

The meta-regression model assessing the effect of income on financial inclusion, adjusted for regional context, study sample size, year of study, and the type of financial inclusion measure, yielded several important findings.

Table 3 Meta-Regression Results

	Estimate	Se	Zval	Pval	ci.lb	ci.ub	
Intrcpt	-6.5382	411.8412	-0.0159	0.9873	-813.732	800.6558	
Region	0.1585	0.4281	0.3703	0.7112	-0.6806	0.9977	
Sample Size	-0.017	0.0076	-2.228	0.0259	-0.0319	-0.002	*
Year	0.008	0.2037	0.0391	0.9688	-0.3912	0.4072	
Financial inclusion Measure	-1.9814	0.6955	-2.8487	0.0044	-3.3446	-0.6182	**

Figure 10 Funnel plot: income effect



Source: Author's computation from meta-analysis (2024).

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The intercept (β = -6.54, p = 0.9873) was not statistically significant, indicating no overall baseline effect when moderators are zero. Among the moderators: Sample size showed a statistically significant negative effect (β = -0.0170, p = 0.0259), suggesting that studies with larger sample sizes tend to report lower effect sizes of income on financial inclusion. This might reflect greater precision and reduced sampling bias in larger studies. Financial inclusion Measure categorical indicator of the type of financial inclusion assessed was also significant (β = -1.9814, p = 0.0044), indicating that the measured outcome of financial inclusion influences the reported effect of income. Specifically, some measurement types, access to credit vs. account ownership may be more sensitive to income effects. In contrast, Region (β = 0.1585, p = 0.7112) and Year (β = 0.0080, p = 0.9688) were not statistically significant predictors of heterogeneity, implying little variation in the income effect across different study locations or years. These results underline that variation in effect sizes across studies is partly explained by sample size and the type of financial inclusion indicator used, while other moderators, such as year and region, had negligible effects.

DISCUSSION

The meta-analysis revealed that income, financial literacy, and experience were statistically significant determinants of rural financial inclusion in Ethiopia at the 10% level. These results align with both theoretical expectations and empirical evidence from previous studies. The significant positive relationship with income supports the Credit Rationing Theory (Stiglitz & Weiss, 1981), consistent with findings in other developing economies (Verma, & Giri, 2024; Demirgüç-Kunt *et. al.*, 2022). Higher, stable income streams reduce perceived lender risk and improve repayment capacity, solidifying income as a core inclusion determinant. Financial literacy also demonstrated a significant positive association, aligning with the New Institutional Economics (NIE) perspective (North, 1990) by reducing informational asymmetry and enabling better understanding of formal products. This echoes Sub-Saharan African evidence linking literacy to improved uptake of banking and digital finance (Zins & Weill, 2016; Bongomin *et. al.*, 2022). Credit experience, indicating prior engagement, was a significant determinant, reinforcing trust, credit histories, and familiarity with formal systems (Koomson *et. al.*, 2023), reflecting a "learning-by-doing" dynamic (Cole *et. al.*, 2011).

Conversely, gender was statistically insignificant, possibly due to Ethiopia's gradual policy shifts toward equity (National Bank of Ethiopia, 2021). Distance also showed no significant constraint, likely a result of digital and agent banking expansion reducing transaction costs (Gibson *et. al.*, 2015; Abebe *et. al.*, 2023). The non-significance of farm size and livestock ownership suggests traditional asset-based measures are less critical in modern rural lending, as formal institutions increasingly prioritize income stability or cooperative membership. This reflects an NIE-driven institutional transition from asset-based to information-based lending models (North, 1990; Beck *et. al.*, 2018).

The high levels of heterogeneity observed across studies highlight the variability of determinants across regions, sample sizes, and measurement indicators. This meta-analysis reveals that variations in effect sizes are significantly explained by sample size and the type of financial inclusion indicator used. In contrast, other potential moderators, such as the year of study publication and geographic region, demonstrated negligible explanatory power in accounting for the observed heterogeneity. As Faber and Fonseca (2014) note, sample size significantly impacts results. Our findings suggest that differing sample sizes contribute to heterogeneity, requiring careful justification in primary studies and consideration in meta-analyses.

The type of financial inclusion indicator (Duraiyarasan *et. al.*, 2023) is crucial. Financial inclusion is multifaceted, involving access and usage (Bae *et. al.*, 2012). For example, studies that have used different measurements of FI indicators such as access to account (e.g., Tamane *et. al.*, 2024; Abdu & Adam 2022), Access to credit (e.g., Dagnachew *et. al.*, 2022; Tesfaye, & Worku, 2019), access to saving (e.g., Mazengiya, *et. al.*, 2022), reported significantly different number of estimates. Different measurement approaches (e.g., access vs. usage) can yield divergent effect sizes, highlighting the need for clarity and standardization. This highlights methodological considerations as crucial determinants.

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Limitations and Future Research Directions

This study is not without limitations. First, the analysis relied on a limited number of variables extracted from available studies, which may not fully capture the multidimensional nature of financial inclusion in rural Ethiopia. Second, most of the reviewed studies were geographically concentrated in Oromia and Amhara regions, creating potential regional bias and limiting national representativeness. Third, the review included only English-language publications retrieved mainly from Database, which may have excluded relevant studies from other databases or local repositories. Despite these constraints, the meta-analysis provides a strong empirical basis for understanding key determinants of financial inclusion. Future research should expand coverage to underrepresented regions, incorporate additional variables such as digital finance and institutional governance, and apply longitudinal or mixed-method approaches to explore causal pathways and policy impacts more deeply.

CONCLUSION

This meta-analysis examined empirical evidence from 18 studies conducted between 2017 and 2024 to identify and synthesize the key determinants influencing financial inclusion in rural Ethiopia. Using a random-effects model, the analysis quantified the pooled effects of several socioeconomic and institutional variables. Among the tested factors, income, financial literacy, and credit experience emerged as statistically significant determinants of financial inclusion at the 10% level of significance. The pooled coefficient for income confirmed that higher income is consistently associated with increased likelihood of formal financial service use. Similarly, financial literacy and prior credit experience were also positively and significantly linked with financial inclusion. These findings underscore the importance of enhancing income-generating activities, promoting financial education, and supporting introductory engagement with credit institutions to improve financial access in rural areas.

Despite the positive outcomes for these three determinants, the meta-analysis revealed substantial heterogeneity across studies, indicating context-specific differences. To address this, a meta-regression model was employed. The results revealed that sample size and the type of financial inclusion measure were significant moderators explaining the variation in the effect on financial inclusion. In contrast, region and year of publication were not significant moderators, suggesting that the income-inclusion relationship is more sensitive to study design and measurement than to geography or time. These findings emphasize the necessity for harmonized measurement tools and large-scale, representative sampling in financial inclusion research.

Overall, this study highlights the centrality of income, literacy, and financial behavior in shaping rural financial inclusion in Ethiopia. While other frequently studied variables, such as gender, education, distance, and institutional trust were not statistically significant, their effects may be mediated through income or influenced by regional disparities. The findings provide a robust evidence base for designing targeted interventions and policies aimed at bridging the rural financial inclusion gap particularly through income support programs, financial literacy training, and access to formal credit products.

RECOMMENDATIONS

Based on the findings of the meta-analysis and meta-regression, the following policy and research recommendations are proposed to enhance financial inclusion among rural populations in Ethiopia.

Given the significant and consistent positive effect of income on financial inclusion, policies should prioritize rural economic empowerment. This includes strengthening value chains in agriculture, expanding access to markets, and investing in rural infrastructure. Programs supporting smallholder farmers, youth enterprises, and women-led businesses can significantly boost disposable income and enhance access to formal financial services.

The results confirm that financial literacy has a positive and significant impact on rural financial inclusion. Stakeholders, including the National Bank of Ethiopia, microfinance institutions, cooperatives, and civil society organizations, should implement community-based financial education programs. Tailored content that addresses saving habits, interest rates, digital tools, and credit management will empower rural households to make informed financial decisions.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue X October 2025

The significant role of credit experience suggests that introducing basic and low-risk financial products can build familiarity and trust. Institutions should consider designing entry-level credit schemes with simple repayment terms and integrating group lending or saving-and-credit cooperatives to build borrower confidence and financial behavior.

The meta-regression revealed that the variation in financial inclusion measurement contributes to inconsistencies in effect sizes. There is a need to harmonize how financial inclusion is defined and measured in research and monitoring frameworks. Adopting national-level indicators in alignment with the Global Findex or NFIS benchmarks can facilitate comparability and consistency across studies.

Although the region was not statistically significant in the meta-regression, high heterogeneity across studies indicates that local context still matters. Financial inclusion strategies should be sensitive to the economic, social, and institutional realities of each region, particularly in underserved areas with limited banking infrastructure.

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