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Impact of Mobile Money Services on Digital Financial Inclusion in East and Sub-Saharan Africa

A Systematic Review and Meta-Analysis: Evidence from 2010 to 2026

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Abstract

Mobile money has expanded rapidly in East Africa and Sub-Saharan Africa (SSA) since the late 2000s and is widely credited with advancing digital financial inclusion, yet the empirical evidence remains fragmented. The purpose of this review is to synthesize empirical evidence published between 2010 and 2026 on the relationship between mobile money and digital financial inclusion in East Africa (Kenya, Uganda, Tanzania, Rwanda, Ethiopia) and in SSA. Systematic review is reported according to PRISMA 2020 and the SWiM guideline. 158 records were screened, 80 full texts were assessed and 54 studies were included. Two outcome domains were quantified: the gender gap in account ownership (k = 4 countries) and the effect of phone ownership on mobile money use (k = 3 studies). Other outcomes were synthesized narratively. One study was at low risk of bias, 36 raised some concerns, 13 were at high risk and 4 were data sources or conceptual papers that were not appraised. Country gender gaps in account ownership ranged from 13.0 to 27.0 percentage points (pp). The random-effects mean was 19.0 pp (DerSimonian-Laird 95% CI 13.1-24.9; Hartung-Knapp 95% CI 9.4-28.6; 95% prediction interval -6.8 to 44.8) with substantial heterogeneity (I^2 = 72.7%). The pooled estimate was exploratory because of substantial heterogeneity. Estimated effects of phone ownership on mobile money use ranged from 11.0 to 17.5 pp (unweighted mean 14.1 pp). Consumption smoothing and risk sharing was consistently positive, evidence on savings was mixed, and security, fees and thin agent networks were the dominant barriers. Mobile money has widened account-level inclusion, but nominal ownership overstates active, welfare-enhancing use. The strongest evidence concerns risk sharing rather than savings. Policy should shift from expanding ownership to narrowing the ownership-usage gap through lower fees, denser rural agent networks, fraud controls and gender-responsive literacy.

Keywords: Mobile Money; Digital Financial Inclusion; Financial Technology; Gender Gap; Systematic Review and Meta-Analysis.

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1. Introduction

1.1 Background and rationale

Financial inclusion, defined as access to appropriate and responsibly offered financial services and products for all people, is regarded as an important driver of poverty alleviation and inclusive growth (Sarma & Pais, 2011). SSA has the lowest rates of traditional, bank-based financial inclusion, yet it also has the highest level of inclusion through mobile money. Non-bank mobile money accounts make up a significant share of account holding in the region (Demirgüç-Kunt et al., 2018; Demirgüç-Kunt et al., 2022).

East Africa has become the most researched setting for mobile money worldwide. The M-Pesa system introduced by Safaricom in 2007 is the classic case (Ahmad et al., 2020; Jack & Suri, 2014; Suri & Jack, 2016). Uganda, Tanzania and Rwanda followed with their own systems from around 2009-2010. Ethiopia was a relatively late entrant: the National Bank of Ethiopia permitted non-bank mobile money after regulatory changes in 2020, and Ethio Telecom launched TeleBirr in May 2021 (Yimam, 2023).

Many country-level studies exist, but to the authors' knowledge no review combines the East African evidence with the wider Sub-Saharan literature using a PRISMA-based procedure, appraises the risk of bias of the included studies, and quantifies the outcomes for which comparable estimates exist. Earlier reviews concentrate on adoption determinants (Hornuf et al., 2025), digital banking and gender (Akenzua, 2025), or emerging themes (Osabutey & Jackson, 2024). This review addresses that gap by systematically searching screening, appraising and synthesizing studies published between 2010 and 2026.

1.2 Objectives

General objective. To synthesize the empirical evidence published between 2010 and 2026 on the relationship between mobile money and digital financial inclusion in East Africa and SSA (together, the study region), and to judge how reliable that evidence is.

Specific objectives.

- To identify and describe empirical studies on mobile money and financial inclusion in the study region.
- To appraise the risk of bias of each included study.
- To estimate, where data permit, the gender gap in account ownership across countries.
- To summarize, where data permit, the effect of phone ownership on mobile money use.
- To synthesize narratively the evidence on determinants of adoption, savings and credit, remittances and risk sharing, poverty, firm performance and barriers to deep inclusion.
- To derive policy implications for narrowing the gap between account ownership and active use.

1.3 Research questions

Each question addresses a single issue. Table 1 shows how each question is answered.

Table 1: Research questions and the synthesis used to answer each

No.	Research question	Synthesis	Sections
RQ1	What is the nature of the relationship between mobile money adoption and financial inclusion outcomes (account ownership, savings, credit access, remittances) in the study region?	Meta-analysis (Domain 2); SWiM	4.5, 4.6.2, 4.6.3
RQ2	How robust is the evidence for the relationship identified in RQ1?	Risk of bias; certainty	4.3, 4.7
RQ3	Which individual, household, infrastructure-related and perception-related characteristics predict mobile money adoption or use?	SWiM	4.5, 4.6.1, 4.6.6
RQ4	What is the impact of mobile money on household well-being, consumption smoothing and poverty?	SWiM	4.6.3
RQ5	Through which mechanisms does mobile money affect household well-being?	SWiM	4.6.3
RQ6	What is the impact of mobile money on firm performance?	SWiM	4.6.5
RQ7	What is the magnitude of the gender gap in mobile-money-driven financial inclusion?	Meta-analysis (Domain 1); SWiM	4.4, 4.6.4
RQ8	How persistent is that gender gap over time?	SWiM	4.6.4
RQ9	Which factors explain the gender gap?	SWiM	4.6.4
RQ10	Which policy interventions identified in the literature narrow the gap between account ownership and active use?	Discussion	5, 7

1.4 Significance of the review

Policy. Regulators, central banks and mobile network operators need to know whether rising account numbers translate into active use and welfare gains. The review shows where evidence is strong (risk sharing), where it is mixed (savings) and where it is thin (supply-side and experimental evidence), which helps target fee regulation, agent-network investment and fraud controls. For Ethiopia, where TeleBirr is recent, it places early evidence beside the longer East African record.

Research. The review maps the literature by design and country, appraises its risk of bias, and identifies gaps such as the scarcity of randomized evidence and the routine omission of standard errors in secondary summaries.

Methodological. It shows why a pooled estimate should not be read as a single effect when heterogeneity is high and few units are available, and it demonstrates the reporting that is needed to avoid that error.

Development. The findings bear on Sustainable Development Goals 1 (no poverty), 5 (gender equality) and 8 (decent work and economic growth), including the financial-access target under Goal 8.

2. Theoretical framework

2.1 Adoption and technology acceptance models

The adoption literature relies heavily on the Technology Acceptance Model (TAM) and its extensions. TAM holds that perceived ease of use and perceived usefulness are the main drivers of behavioral intention to adopt a new information system (see, for example, Hornuf et al., 2025). The Unified Theory of Acceptance and Use of Technology (UTAUT2) adds social influence, habit, facilitating conditions and price value, which are used in East African research on agent-network trust and fee sensitivity (Hamdan et al., 2022).

2.2 Theory of financial inclusion and inclusive development

Sarma and Pais (2011) laid the groundwork for the multi-dimensional Index of Financial Inclusion, in which inclusion covers access, availability and use rather than account ownership alone. This distinction is central to the review because several included studies show large differences between ownership and use (Hamdan et al., 2022; Dubus & Van Hove, 2019).

2.3 Risk-sharing and consumption-smoothing theory

A separate perspective rests on household consumption smoothing, in which mobile phone technology lowers transaction costs and strengthens risk-sharing networks (Jack & Suri, 2014; Riley, 2018; Blumenstock et al., 2016). It underpins the welfare findings in Section 4.6.3.

3. Methodology

3.1 Review design

This is a systematic review of secondary evidence with a limited quantitative synthesis. No primary data were collected. The unit of analysis is the study (report); for the gender-gap meta-analysis it is the country-level estimate. The review follows PRISMA 2020 (Page et al., 2021a, 2021b), PRISMA-S for reporting the search (Rethlefsen et al., 2021) and SWiM for synthesis without meta-analysis (Campbell et al., 2020). Table 2 summarizes the design.

Table 2: Summary of the review methodology

Element	Description
Review type	Systematic review with limited meta-analysis and SWiM narrative synthesis.
Reporting guidelines	PRISMA 2020; PRISMA-S; SWiM.
Registration and protocol	Not registered; no prior protocol (Section 3.2).

Element	Description
Data type and source	Secondary data: published empirical studies, reviews and working papers retrieved from bibliographic databases, publisher platforms, repositories and institutional series.
Sampling technique	None. A review does not draw a probability sample. Records were identified by a systematic, criterion-based (non-probability, purposive) search that aims to capture all eligible records in the named sources. Eligibility criteria define the sample.
Time frame and language	Published 2010-2026; English.
Search	25 search strings across 15 source groups (Sections 3.4-3.5).
Selection	Two independent reviewers, third reviewer for disagreements; title/abstract then full-text screening (Section 3.6).
Data extraction	Structured extraction form completed by one reviewer and checked by a second (Section 3.7).
Risk of bias	Design-specific tools: RoB 2, ROBINS-I, JBI checklists, AMSTAR 2 (Section 3.8).
Synthesis	Random-effects meta-analysis (Domain 1); descriptive range (Domain 2); vote counting by direction of effect (SWiM) for other domains (Section 3.9).
Software	Computations in Python (NumPy, SciPy); figures in Matplotlib.

3.2 Protocol and registration

The review was not prospectively registered in PROSPERO, the Open Science Framework or any other registry, and no protocol was published or deposited before screening began (PRISMA 2020 items 24a and 24b). The eligibility criteria, sources and synthesis plan described in this section were set by the review team before full-text screening but were not time-stamped in a public registry. The possibility that analytic choices were influenced by the data therefore cannot be excluded.

Three post hoc changes are disclosed (item 24c). First, an inverse-variance model was abandoned for Domain 2 because standard errors were unavailable. Second, after heterogeneity was observed in Domain 1, the Hartung-Knapp interval, a prediction interval and sensitivity analyses were added and the pooled mean was reframed as exploratory. Third, the risk-of-bias appraisal and the certainty assessment were added during revision.

3.3 Eligibility criteria

Eligibility was specified using a population-exposure-comparator-outcome-study design (PECOS) framework (Table 3).

Table 3: Eligibility criteria (PECOS)

Element	Criterion
Population	Individuals, households, firms or markets in East Africa (Kenya, Uganda, Tanzania, Rwanda, Ethiopia) or elsewhere in SSA. Multi-region studies were eligible only if SSA countries were analyzed or reported separately.

Element	Criterion
Exposure	Access to, adoption of or use of mobile money, including mobile-money-based savings and credit products.
Comparator	Non-users, pre-adoption periods, lower access, or other groups (for example women versus men), where the design allows.
Outcomes	Account ownership, active use, savings, credit, remittances, consumption smoothing, poverty or welfare, firm performance, security and trust, and gender or rural-urban differences in these outcomes.
Study design	Qualitative, quantitative or mixed-methods empirical studies, and structured reviews.
Publication type	Peer-reviewed articles; conference papers; working papers from recognized institutional series (NBER, IZA, SSRN, IMF, World Bank, university research centers); dissertations or theses.
Period and language	Published from 2010 to 2026; full text in English.
Verifiability	Author names, publication year, journal or series, and a working URL or DOI independently confirmable; full text accessible.

Exclusion criteria. Records were excluded if they (a) focused on a region outside East Africa or SSA; (b) were opinion pieces, narrative commentary, vendor or blog material, or press coverage without an empirical method; (c) were duplicates, including working papers superseded by a published version of the same study; or (d) failed the verifiability criterion at the time of the search. Grey literature outside the recognized series listed in Table 3 was ineligible.

3.4 Information sources

Searches covered Google Scholar, ScienceDirect, Wiley Online Library, Taylor & Francis Online (including Cogent journals), SpringerLink, SSRN, NBER, the IMF eLibrary, the World Bank Open Knowledge Repository, IZA, IDEAS/RePEc, MDPI, SAGE, Cambridge Core and institutional repositories (IPRJB, IIARD, IJECM, arXiv). The last search was run in August 2026 (final update; authors to confirm against the search log). Scopus and Web of Science were not searched (Section 6).

3.5 Search strategy

Twenty-five search strings were used. They combined terms for mobile money (mobile money, M-Pesa, TeleBirr, mobile banking) with financial inclusion, each East African country, gender inequality, systematic review or PRISMA, poverty and remittances, agent banking, COVID-19, the digital divide, security, fraud and trust, firm or SME performance, and West and Central African countries. A representative string was: ("mobile money" OR "M-Pesa" OR "TeleBirr" OR "mobile banking") AND ("financial inclusion" OR "account ownership") AND (Kenya OR Uganda OR Tanzania OR Rwanda OR Ethiopia OR "East Africa" OR "Sub-Saharan Africa"). Date (2010-2026) and language (English) limits were applied. The 25 strings are reproduced in Appendix C (Table C1) and the sources searched in Table C2.

3.6 Study selection process

Selection proceeded in two stages: title and abstract screening, then full-text assessment against Table 3. Two reviewers (AFB, GAS and TBW) screened every record independently at both stages. Disagreements were resolved by discussion, and a third reviewer (ZKA) made the final decision when the two could not agree. A record entered the included list only after its author names, publication year, journal or series, and a working URL or DOI had been independently confirmed. Duplicates were removed before screening, and a working paper was dropped when a published version of the same study was retrieved. Inter-reviewer agreement was not quantified.

3.7 Data collection process and data items

A structured extraction form was completed for each included study by one reviewer and checked by a second; discrepancies were resolved as in Section 3.6. Items extracted were: authors, year and publication type; country or region; design and data source; sample size and unit; exposure and comparator; outcome and effect measure; effect size, uncertainty and direction; reported moderators; funding where stated; and the information needed for risk-of-bias appraisal. Where a study did not report a standard error, none was imputed from the study itself; the specific handling of missing precision is described in Section 3.9.

3.8 Risk-of-bias assessment

Risk of bias was assessed for every included study except data sources and conceptual papers. Two reviewers appraised each study independently, with disagreements resolved as in Section 3.6. Tools were matched to design: RoB 2 for randomized trials (Sterne et al., 2019); ROBINS-I for panel, quasi-experimental and aggregate studies, adapted for aggregate data (Sterne et al., 2016); JBI checklists for cross-sectional and qualitative studies (Moola et al., 2020); and AMSTAR 2 for reviews (Shea et al., 2017). Domains considered included confounding, participant or unit selection, measurement of exposure and outcome, missing data or attrition, selective reporting, and quality of the data source.

Results were mapped to three levels: low risk, some concerns (ROBINS-I moderate; JBI 50-79% of items met) and high risk (ROBINS-I serious or critical; JBI below 50%). Studies were not excluded on risk of bias. Ratings were used to qualify the certainty of each synthesized domain and to check whether conclusions changed when high-risk studies were set aside.

3.9 Effect measures and synthesis methods

Domain 1: gender gap in account ownership. The effect measure was the percentage-point difference in account ownership between men and women in each country, taken from the Global Findex 2021 database as reported by Demirgüç-Kunt et al. (2022). No source reported standard errors. Each was calculated with the two-proportion formula, assuming about 1,000 respondents per country (about 500 per gender) and a proportion of 0.5, which gives the largest variance and an identical standard error of 3.16 pp for every country. Estimates were combined

with a DerSimonian-Laird random-effects model (DerSimonian & Laird, 1986). Because the number of countries was small, the Hartung-Knapp confidence interval with t-distribution (Hartung & Knapp, 2001; IntHout et al., 2014) and a 95% prediction interval (IntHout et al., 2016) were also computed. Heterogeneity was summarized with Cochran's Q, tau^2 and I^2 with its confidence interval (Higgins & Thompson, 2002). Sensitivity analyses omitted each country in turn and varied the assumed standard error through design effects of 1.5 and 2.0.

A post hoc interpretation rule was applied: when I^2 exceeded 50% or fewer than five units were available, the pooled mean was reported only as an exploratory summary, and the range of country estimates was treated as the primary result.

Domain 2: phone ownership and mobile money use. Three studies reported marginal effects in percentage points without standard errors. Inverse-variance pooling was therefore not possible, and the estimates are presented individually with their range and an unweighted mean for description only. Two of the three estimates draw on the same Ugandan panel, so they are not independent.

Other domains. Outcomes measured on incompatible scales (trial effects, probit marginal effects, path coefficients, headcount changes, elasticities) were synthesized by vote counting on direction of effect, grouped by outcome domain, as the SWiM guideline permits. Direction rather than statistical significance was counted, and results are shown in Table 9 with the number of studies at high risk of bias. A study can inform more than one domain.

3.10 Reporting bias and certainty of evidence

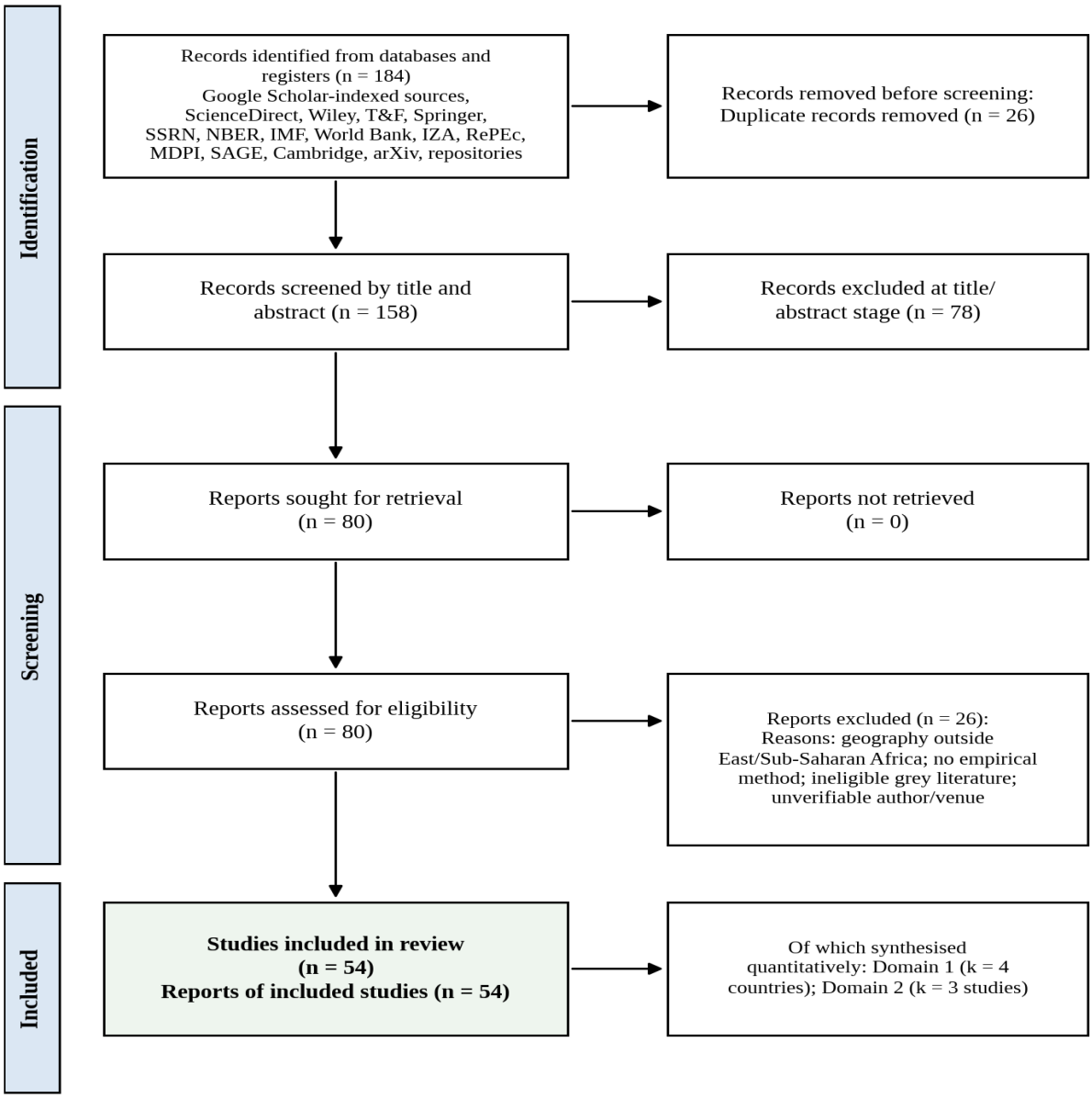
Funnel plots and small-study tests were not run because fewer than ten units were available for any pooled outcome (Higgins et al., 2023). Selective reporting was considered qualitatively through the risk-of-bias domains. Certainty for each domain was rated high, moderate, low or very low by a GRADE-inspired judgment of risk of bias, consistency, directness, precision and likelihood of publication bias; this was an informal assessment and not a formal GRADE exercise.

4. Results

4.1 Study selection

The search identified 184 records. After 26 duplicates were removed, 158 records were screened by title and abstract and 78 were excluded because of geography outside East Africa or SSA, absence of an empirical method, ineligible grey literature or unverifiable authorship. All 80 remaining reports were retrieved and assessed in full; 26 were excluded for the same categories of reason, leaving 54 included studies. Figure 1 shows the PRISMA 2020 flow diagram and Table 4 the stage-by-stage counts. The count for each reason is given in Appendix C (Table C3), as PRISMA item 16b requires.

Figure 1: PRISMA 2020 flow diagram



Source: Researchers' compilation, adapted from the PRISMA 2020 flow diagram for new reviews that searched databases and registers only (Page et al., 2021a; Haddaway et al., 2022).

Table 4: PRISMA screening table with arithmetic check

Stage	Records	Calculation
Records identified from databases and registers	184	-
Duplicate records removed	26	184 - 26 = 158
Records screened (title and abstract)	158	-
Records excluded at title and abstract stage	78	158 - 78 = 80
Reports sought for retrieval	80	-
Reports not retrieved	0	80 - 0 = 80
Reports assessed for eligibility	80	-

Stage	Records	Calculation
Reports excluded after full-text review	26	80 - 26 = 54
Studies included in the review	54	-

4.2 Characteristics of included studies

The 54 included studies are listed in Appendix A. By geography, 25 concern East Africa, 14 are multi-country or regional studies of SSA, 9 concern a single country elsewhere in SSA and 6 are cross-country studies that include non-SSA economies. Cross-sectional designs predominate (23 studies), followed by reviews (8), panel or quasi-experimental studies (9), aggregate studies (6), qualitative studies (3) and two randomized trials, both from Mozambique. Three records are data sources or conceptual papers.

Table 5: Included studies by design and geography

Category	Studies (n)	Appraisal tool
Randomized trials	2	RoB 2
Panel or quasi-experimental studies	9	ROBINS-I
Cross-sectional or repeated cross-sectional studies	23	JBI cross-sectional checklist
Qualitative or exploratory studies	3	JBI qualitative checklist
Aggregate or cross-country studies	6	ROBINS-I (adapted)
Systematic, narrative or bibliometric reviews	8	AMSTAR 2
Data sources or conceptual papers	3	Not applicable
Total	**54**	

4.3 Risk of bias in included studies

No included study was free of risk of bias in the sense of being beyond concern on every domain. Only one of the 54 (1; Batista & Vicente, 2020, a peer-reviewed field trial) was rated low risk. 36 studies raised some concerns, 13 were at high risk and 4 (the two Global Findex reports, Sarma & Pais, 2011, and the bibliometric analysis by Nefla et al., 2026) were not appraised. Table 6 gives the distribution by design and Appendix A the rating of each study.

Table 6: Risk-of-bias ratings by study design

Design	Low	Some concerns	High	Not appraised
Randomized trials	1	1	0	0
Panel or quasi-experimental studies	0	9	0	0
Cross-sectional or repeated cross-sectional studies	0	16	7	0
Qualitative or exploratory studies	0	2	1	0
Aggregate or cross-country studies	0	1	5	0
Systematic, narrative or bibliometric reviews	0	7	0	1
Data sources or conceptual papers	0	0	0	3

Design	Low	Some concerns	High	Not appraised
Total	**1**	**36**	**13**	**4**

Typical concerns differed by design. Panel and quasi-experimental studies faced residual confounding and attrition. Cross-sectional studies, which supply most of the evidence on adoption and firm outcomes, faced self-selection into mobile money use and reliance on self-reported outcomes. Aggregate cross-country studies could not rule out reverse causality. The high-risk group also included low-visibility venues and a conference case study with limited methodological reporting. Findings from the strongest designs (the trials and the household panels) point in the same direction, which raises confidence in the direction of effects but not necessarily in their size.

Domain-level judgments by design are given in Appendix D (Table D1). The ratings were assigned at design level from the reported methods.

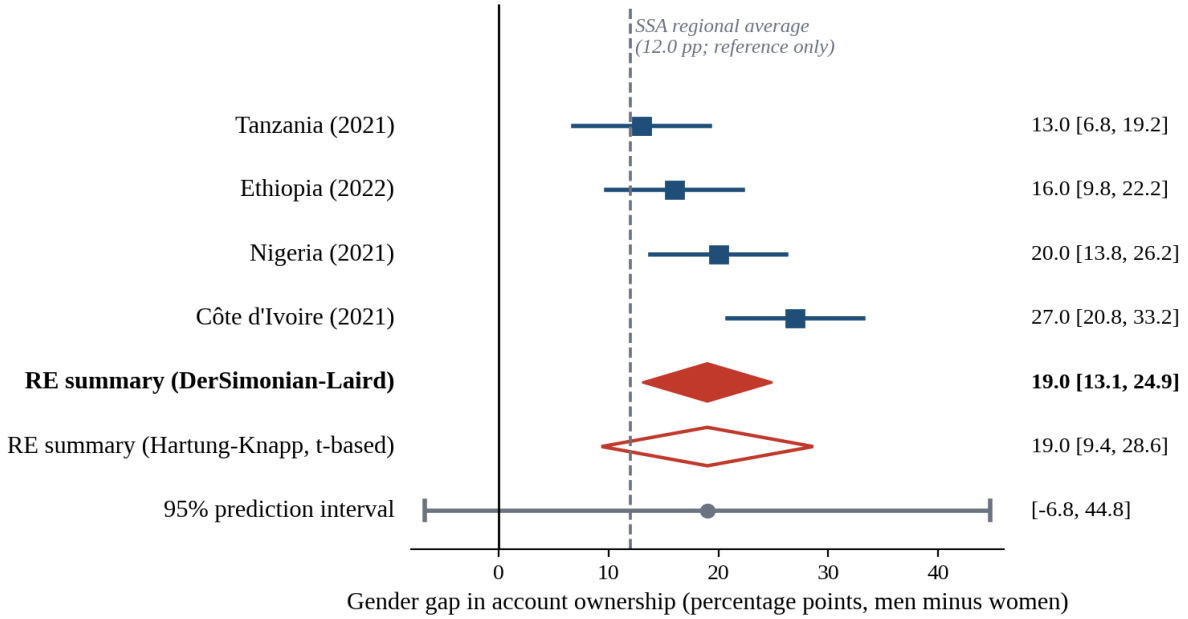
4.4 Meta-analysis, Domain 1: gender gap in account ownership

Four countries provided directly comparable gender-gap statistics from Global Findex data: Tanzania (13.0 pp, 2021), Ethiopia (16.0 pp, 2022 update), Nigeria (20.0 pp, 2021) and Côte d'Ivoire (27.0 pp, 2021). Table 7 and Figure 2 show the estimates. All standard errors were derived under the assumption in Section 3.9.

Table 7: Country-level gender gaps used in Domain 1

Country (year)	Gap (pp)	Assumed SE (pp)	95% CI (pp)	RE weight
Tanzania (2021)	13.0	3.16	6.8 to 19.2	25%
Ethiopia (2022)	16.0	3.16	9.8 to 22.2	25%
Nigeria (2021)	20.0	3.16	13.8 to 26.2	25%
Côte d'Ivoire (2021)	27.0	3.16	20.8 to 33.2	25%

Figure 2: Forest plot of the gender gap in account ownership with prediction interval



Source: Researchers' compilation.

Heterogeneity was substantial (Q = 11.0, p = 0.012; tau² = 26.7; I² = 72.7%), although the confidence interval for I² is wide (23% to 90%) because only four countries contribute. The DerSimonian-Laird mean was 19.0 pp (95% CI 13.1-24.9). Because that interval is known to be too narrow with few units, the Hartung-Knapp interval is the more defensible summary (9.4-28.6), and the 95% prediction interval for the gap in a comparable new country runs from -6.8 to 44.8 pp. A prediction interval that includes zero shows how little the mean says about any single country.

The pooled value is therefore **not** interpreted as a common gender gap for the region. The primary finding is the range of country estimates, 13.0 to 27.0 pp, and the fact that the gap varies significantly between countries. Two further points limit the mean. First, because all assumed standard errors are identical, the random effects mean equals the simple average of the four estimates, so weighting adds no information. Second, I² depends on the assumed precision: with design effects of 1.5 and 2.0 it falls to 59.1% and 45.5% (Table 8), although the mean stays at 19.0 pp. Heterogeneity is driven mainly by Côte d'Ivoire; omitting it lowers the mean to 16.3 pp and I² to 18.9%, but with three countries this should not be over-read.

The comparison with the regional average is descriptive. The intervals for Nigeria (13.8-26.2) and Côte d'Ivoire (20.8-33.2) lie above 12.0 pp, whereas those for Tanzania (6.8-19.2) and Ethiopia (9.8-22.2) include it. The regional figure comes from a different population and year, so no formal test is possible.

Table 8: Sensitivity analyses for Domain 1

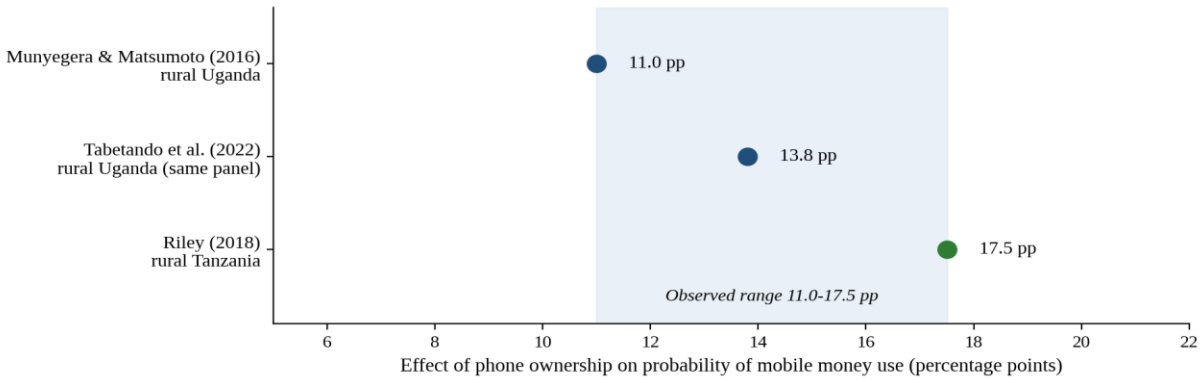
Scenario	Mean (pp)	I² (%)	tau²	95% CI (DL)
Primary analysis	19.0	72.7	26.7	13.1 to 24.9

Scenario	Mean (pp)	I^2 (%)	tau^2	95% CI (DL)
Omit Tanzania	21.0	67.7	21.0	14.7 to 27.3
Omit Ethiopia	20.0	79.6	39.0	12.1 to 27.9
Omit Nigeria	18.7	81.6	44.3	10.3 to 27.0
Omit Côte d'Ivoire	16.3	18.9	2.3	12.4 to 20.3
Assumed design effect 1.5 (SE 3.87)	19.0	59.1	21.7	-
Assumed design effect 2.0 (SE 4.47)	19.0	45.5	16.7	-

4.5 Domain 2: phone ownership and mobile money use

Three panel studies from East Africa estimated the effect of owning a mobile phone on the probability of using mobile money: Munyegera and Matsumoto (2016; rural Uganda; 11.0 pp), Tabetando et al. (2022; rural Uganda; 13.8 pp) and Riley (2018; rural Tanzania; 17.5 pp). Standard errors were not obtainable because full regression output was not accessible. No inverse-variance model is reported, since it would convey false precision.

Figure 3: Estimated effect of phone ownership on mobile money use



Source: Researchers' compilation.

The estimates range from 11.0 to 17.5 pp, with an unweighted mean of 14.1 pp (SD 3.26), given for description only. All three are positive and of similar order, but with two estimates from one dataset the evidence is effectively two independent sources, and the mean must not be read as a pooled effect or as a precise estimate.

4.6 Narrative synthesis (SWiM) of non-pooled outcomes

Table 9 summarizes direction, consistency, risk of bias and certainty by domain. Narrative detail follows.

Table 9: SWiM summary of effect direction by outcome domain

Domain	RQ	Studies (n)	Direction of effect	Consistency	High risk (n)	Certainty
Determinants of adoption and use	RQ3	13	Positive: infrastructure, agents, education, income; gender effect varies by sub-region	Consistent	2	Low to moderate
Savings and credit	RQ1	5	Mixed: positive where product is savings-specific; weak where wallet is payment-only	Inconsistent	0	Low
Remittances, risk sharing, consumption smoothing	RQ1, RQ4, RQ5	11	Positive	Consistent	2	Moderate
Poverty and inclusive development	RQ4	5	Positive (poverty reduction; macro evidence weaker)	Consistent	3	Low
Gender gap	RQ7, RQ8, RQ9	5	Persistent gap, largely linked to education, employment, assets	Consistent	0	Moderate (existence); low (magnitude)
Firm performance and the banking sector	RQ6	5	Mostly positive for innovation, finance access, resilience; no sales effect (Tiwasing et al.); mixed for banks	Mostly consistent	5	Low
Trust, security, fraud and other barriers	RQ3	4	Barriers reported in every study	Consistent	1	Low
Social networks, spatial inequality, market structure	RQ1	3	Effects moderated by networks; rural-urban gaps persist	Insufficient studies	0	Low

4.6.1 Determinants of adoption (RQ3)

Perceived ease of use and perceived usefulness are the two most frequently identified determinants of adoption (Hornuf et al., 2025, summarizing the SSA literature). Infrastructure is a second consistent set: distance from financial institutions and mobile network presence positively predict adoption (Mothobi & Grzybowski, 2017; Grzybowski et al., 2023), and network effects shape the uptake of the phones that mobile money requires (Grzybowski, 2015). Education, income, age and formal employment are positively associated with adoption and usage intensity in Kenya, Uganda and multi-country samples (Zins & Weill, 2016; Grzybowski et al., 2023; Akinyemi & Mushunje, 2020). Cross-country cluster analysis points to the same macro-level pattern of adoption and inclusion (Peruta, 2017), though with weak identification.

Agent networks recur as a theme. In Kenya and Uganda, well-trained agents able to open accounts are associated with higher adoption (Wakaba & Wepukhulu, 2019; Hamdan et al., 2022), and thin or uneven agent distribution constrains rural adoption (Hamdan et al., 2022; Tabetando et al., 2022). Tabetando et al. (2022), using the Munyegera and Matsumoto (2016) panel from rural Uganda, show that a greater distance to the nearest agent reduces adoption probability. This agrees with Riley's (2018) finding that agent availability matters in rural Tanzania, where it raised adoption probability by roughly 25 pp. Outside East Africa, Jallow and Tajmouati (2025) find that gender, education, income and urban residence predict inclusion in West Africa, whereas gender does not matter in Central Africa after controlling for age, education, income and rural residence.

4.6.2 Savings, credit and other financial services (RQ1)

The evidence is mixed rather than uniformly positive, which does not support a simple equation of mobile money with financial inclusion. Mobile money adoption in Rwanda correlates positively with household savings (Maniriho, 2021), and in Mozambique randomized access to mobile savings raised savings (Batista & Vicente, 2020). By contrast, only 7.6% of M-Pesa customers in Dubus and Van Hove's (2019) study used the service to save for a future purchase, leading the authors to conclude that payment services alone do not deliver savings-based inclusion. The effect on savings therefore appears conditional on product design (dedicated savings product versus general-purpose wallet), financial literacy and behavioral framing.

Digital lending adds to the picture. Suri et al. (2021) report that 34% of eligible Kenyan households took up M-Shwari and that use reduced the probability of forgoing expenses after shocks by 6.3%, without crowding out other credit. This suggests that digital lending complements rather than substitutes for other instruments. Akande et al. (2023), in South Africa, found financial literacy to be a strong direct determinant of financial inclusion ($\beta = 0.452$) and rural livelihoods ($\beta = 0.444$); the study concerns inclusion generally and bears on mobile money only indirectly.

4.6.3 Remittances, risk sharing and household welfare (RQ1, RQ4, RQ5)

This is the domain with the most coherent evidence. In Kenya, Jack and Suri (2014) show that mobile money lowers the transaction costs of remittances and improves risk sharing: user households maintain consumption after idiosyncratic shocks while non-user households do not. Mbiti and Weil (2011) document the rapid growth of M-Pesa transfers in Kenya. In Uganda, Munyegera and Matsumoto (2016) find that mobile money access raises per capita consumption mainly by increasing remittances, and Sekabira and Qaim (2017) report that mobile money raises off-farm income among smallholder coffee farmers through saving and transfer channels. In Tanzania, Abiona and Koppensteiner (2022) find that adopting households' smooth consumption aftershocks and protect investment in children's human capital, and Riley (2018) shows that adoption increases the number of transfers received after a negative village shock. In Rwanda, Blumenstock et al. (2016) document a comparable mechanism through airtime

transfers after the 2008 earthquake; this evidence concerns airtime rather than mobile money and is indirect. In Ghana, Twumasi Baffour et al. (2021) report that mobile money access is associated with higher internal remittances, consumption expenditure and welfare. In Mozambique, field experiments by Batista and Vicente (2020, 2023) randomized access to mobile savings and mobile money, and the 2023 working paper reports increases in savings, investment, consumption and remittances among rural households.

The most significant long-run result is the panel study by Suri and Jack (2016), which estimates that mobile money access lifted about 2% of Kenyan households out of extreme poverty over 2008-2014, with larger effects for female-headed households as women shifted from subsistence farming to business. Yao et al. (2023) find that mobile money significantly stabilizes household consumption against covariate and idiosyncratic shocks in Kenya, while Johnen et al. (2025) show that rural-urban inequalities in inclusion persisted in Kenya between 2012 and 2021 despite national gains. Cross-country studies of SSA and developing economies relate mobile money or mobile banking to lower inequality and poverty (Asongu & le Roux, 2023; Asongu & Odhiambo, 2019) and mobile telephony and inclusion to inclusive growth (Abor et al., 2018), but aggregate designs cannot exclude reverse causality and were rated high risk of bias. Broader reviews provide context (Aker & Mbiti, 2010; Suri, 2017; Ahmad et al., 2020).

4.6.4 Gender gap (RQ7, RQ8, RQ9)

Every included study that examines gender explicitly reports a persistent gap in mobile-money-linked financial inclusion. For Ethiopia, Hundie and Tulu (2023) decompose the gap and find that almost three-quarters is explained by differences in education, labor force participation and asset holding, with the remainder unexplained and consistent with discrimination or social norms. For SSA as a whole, Akenzua's (2025) systematic review identifies a persistent gap of about 15 pp in digital banking use, even though mobile money penetration reached an estimated 64% in the continent by 2023. Global Findex data (Demirgüç-Kunt et al., 2022) show a gap in account ownership of about 12 pp across SSA during the COVID-19 pandemic. Suri and Jack (2016) report larger welfare gains for female-headed households, which suggests that closing the gap carries high returns.

Evidence on persistence is thin. Most sources are single cross-sections or reviews, and only the Kenyan panel follows households for several years. The persistence of the gap over time (RQ8) is therefore supported mainly by the consistency of cross-sectional findings across years and countries, and long-run country-level trend data are a research gap.

4.6.5 Firm-level and moderating effects (RQ6)

Lorenz and Pommet (2021) find that mobile money access is positively related to enterprise innovativeness in Kenya, Uganda and Tanzania through better access to finance. Tiwasing et al. (2024) find that Kenyan firms with mobile money are more innovative in products and processes, although their sales performance is statistically equal to that of other firms, a caution

against overstating firm-level effects. Gosavi (2018) reports better access to finance and productivity for mobile-money-using firms in Eastern SSA. In Zambia, Nan and Park (2022) find that SMEs with mobile money were less likely to suffer falling sales during COVID-19, extending household resilience findings to firms. In Ghana, Kulu et al. (2022) report a mixed relationship between mobile money transactions and banking-sector performance, partly substitutive and partly complementary. All four firm-level studies were rated high risk of bias, so this evidence is weaker than the headline direction suggests.

Bongomin et al. (2018) find that social networks moderate the effect of mobile money on inclusion, and that the effect weakens once network effects are controlled, implying that part of the apparent mobile money effect operates through existing social ties. Economides and Jeziorski (2015) offer a rare supply-side view of the Tanzanian mobile money market.

4.6.6 Trust, security and fraud as barriers (RQ3)

Unaddressed trust and security concerns prevent mobile money from moving from adoption to deep inclusion. In Uganda, Baganzi and Lau (2017) find that structural security and low perceived risk, rather than a general belief in trust, drive behavioral intention to adopt. Ali et al. (2020) describe PIN theft, vishing, agent fraud and SIM-swap attacks in Uganda. For Ghana, Akomea-Frimpong et al. (2019) identify weak know-your-customer compliance and agent collusion as the main sources of fraud. Together with the fee and agent-network barriers in Section 4.6.1, this implies that both sets of barriers must be addressed to narrow the gap between ownership and active use.

4.6.7 Ethiopia-specific and climate-resilience evidence

Yimam (2023) shows that TeleBirr has rapidly expanded digital payments since its 2021 launch while noting rural access, financial illiteracy and infrastructure gaps as persistent barriers, in line with the wider pattern. The gender-gap decomposition by Hundie and Tulu (2023; Section 4.6.4) is the most robust Ethiopian quantitative study in the corpus. Negera et al. (2025) find that financial inclusion, including mobile money access, significantly improves smallholders' resilience to climate shocks in rural Ethiopia, suggesting that the consumption-smoothing mechanism in Section 4.6.3 also operates for climate shocks. That study is cross-sectional and was rated high risk of bias.

4.7 Reporting bias and certainty of evidence

Publication bias could not be assessed statistically because no pooled outcome had ten or more units. It is plausible, because positive findings on a widely promoted technology are more likely to be published. The certainty ratings in Table 9 combine the risk-of-bias profile, consistency, directness and precision of each domain. Certainty is moderate for risk sharing and consumption smoothing, where trials and panels converge, moderate for the existence of a gender gap but low for its magnitude, and low or low-to-moderate for the remaining domains.

5. Discussion

Three overarching findings emerge. First, evidence for the risk-sharing and consumption-smoothing channel is consistent across Kenya, Uganda, Tanzania, Rwanda, Ghana and Mozambique and across observational and experimental designs (Section 4.6.3). Setting aside the studies rated high risk of bias does not change direction. This is the channel where policy can act with the greatest confidence.

Second, findings on savings and wider financial-service use are genuinely mixed (Section 4.6.2). In Kenya, payment use did not translate into savings (Dubus & Van Hove, 2019), and in Uganda many account owners did not use their accounts actively (Hamdan et al., 2022). Policy and product design should therefore shift from raising ownership, already high in much of East Africa, to raising active use.

Third, the gender gap is consistent across diverse settings and methods (Section 4.6.4), and the Ethiopian decomposition (Hundie & Tulu, 2023) implies that most of it reflects socio-economic differences in education, employment and assets rather than the design of mobile money products. Closing it will need policies beyond product design. The quantitative evidence in Section 4.4 supports the existence of a gap in every country examined but, because of high heterogeneity and few countries, not a single regional magnitude.

The risk-of-bias findings qualify all three conclusions. Only one study is at low risk, and the firm-level and cross-country strands rest largely on high-risk designs. The review therefore treats direction as better supported than magnitude.

5.1 Comparison with existing systematic-review literature

Like the reviews in the corpus, Hornuf et al. (2025) find perceived usefulness and ease of use dominant in the adoption literature, and, as here, note relatively little experimental or supply-side evidence beside extensive demand-side survey evidence. Akenzua (2025) reports significant rural access gains with an enduring gender gap, independently confirming the pattern in Section 4.6.4. Osabutey and Jackson (2024) identify the same three policy concerns discussed in Section 7 (security and privacy, infrastructure, stakeholder benefits). Nefla et al. (2026), in a bibliometric analysis of 554 Web of Science articles, find South Africa and Ghana rather than East African countries to be the most productive research settings, whereas the present review, which centers on causal and welfare evidence, draws most heavily on East Africa.

5.2 Comparative regions outside East Africa

Several included studies consider West, Central and Southern African countries (Ghana, Burkina Faso, Zambia, Mozambique). They are retained because the eligibility criteria include SSA, and because studies such as Jallow and Tajmouati (2025), N'dri and Kakinaka (2020) and Akomea-Frimpong et al. (2019) illustrate differences within the region. For example, the gender pattern found in Ethiopia (Section 4.6.4) is not uniform across SSA sub-regions (Section 4.6.1).

6. Limitations

- **No registration or protocol.** Analytic choices could not be checked against a public plan, so selective decisions cannot be excluded. Post hoc changes are disclosed in Section 3.2.
- **Heterogeneity and small k.** Four countries (Domain 1) and three studies (Domain 2) are far fewer than the ten or more usually advised for meta-analysis, and heterogeneity in Domain 1 was substantial. The pooled mean is exploratory.
- **Assumed standard errors.** Domain 1 standard errors were derived under a simple-random-sampling assumption and are identical across countries. Global Findex uses a complex design, so true standard errors are probably larger; I^2 is sensitive to this assumption (Table 8).
- **Non-independent estimates.** Two of the three Domain 2 estimates share a panel, and no standard errors were available, so no inverse-variance model was fitted.
- **Database coverage.** Scopus and Web of Science were not searched because of access restrictions; the search relied on Google Scholar and publisher, repository and institutional sources. Relevant studies may have been missed. Restriction to English language is a further source of selection bias.
- **Risk-of-bias appraisal.** Ratings relied on design-level tools applied to reported methods; paywalled papers limited access to full regression output. Only one included study was at low risk of bias.
- **Reporting bias.** Publication bias could not be tested statistically.
- **Ecological inference.** Domain 1 uses country-level survey estimates, which cannot be interpreted at the level of individuals.

7. Conclusion and policy implications

Since the late 2000s, mobile money has substantially improved access to financial services in East and Sub-Saharan Africa. The most convincing evidence concerns household risk sharing and consumption smoothing. The quantitative synthesis shows that gender gaps in account ownership differ widely between countries, from 13.0 to 27.0 pp, with an exploratory mean of 19.0 pp (Hartung-Knapp 95% CI 9.4-28.6; $I^2 = 72.7\%$) that should not be read as a common value, and that the estimated effect of phone ownership on mobile money use lies between 11.0 and 17.5 pp in three East African panel studies. The narrative synthesis indicates that account ownership overstates active use and that the gender gap reflects underlying socio-economic differences more than product design. No observational study was free of risk of bias.

Four policy implications follow:

- Focus on active usage rather than account ownership, given the documented gap between them (Hamdan et al., 2022; Dubus & Van Hove, 2019).
- Increase rural agent-network density and lower fees, the two main inhibitors of inclusion in the adoption literature (Mothobi & Grzybowski, 2017; Hamdan et al., 2022).
- Expand mobile money provision alongside investment in women's education, formal employment and asset ownership, because the gender gap largely reflects underlying disparities rather than lack of access (Hundie & Tulu, 2023).
- Strengthen fraud controls (KYC compliance, SIM-swap and vishing protection) together with improvements in fees and networks, because security concerns independently limit confidence and use (Ali et al., 2020; Baganzi & Lau, 2017; Akomea-Frimpong et al., 2019).

Research needs. Future work should prioritize randomized and quasi-experimental studies outside Kenya and Uganda, supply-side evidence, long-run gender-gap trends, and routine reporting of standard errors so that estimates can be pooled.

Declarations

Registration and protocol: Not registered; no protocol was prepared (Section 3.2).

Ethics: Not applicable. The review used only published secondary data and involved no human participants.

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Availability of data, code and materials: All data come from the published sources in the reference list. The study-level summary and risk-of-bias ratings are in Appendix A, the domain-level judgments in Appendix D, and the search and screening log in Appendix C. The code that reproduces every quantitative result (Tables 7 and 8, Figures 2 and 3) is provided as Supplementary File S1 (meta analysis.py).

Author contributions: AFB conceived the study and contributed to the review design and conducted literature search, screening, and data organization. AFB, ZKA, TBW and GAS contributed to data interpretation, narrative synthesis, manuscript drafting, and revision. All authors read and approved the final manuscript.

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Appendix A. Characteristics and risk-of-bias ratings of the 54 included studies

Ratings are design-level and provisional until verified against full texts. Low = low risk; Some = some concerns; High = high risk; NA = not appraised.

No.	Study	Country or scope	Design or data	Main outcome domain	Tool	Rating
1	Abiona & Koppensteiner (2022)	Tanzania	Household panel; difference-in-differences with agent expansion	Shocks, consumption, poverty	ROBINS-I	Some
2	Abor et al. (2018)	Africa (cross-country)	Cross-country regression	Inclusive growth	ROBINS-I (adapted)	High
3	Ahmad et al. (2020)	Africa (review)	Literature review	Overview of mobile money and development	AMSTAR 2	Some
4	Aker & Mbiti (2010)	Africa (review)	Narrative review	Mobile phones and development (context)	AMSTAR 2	Some
5	Akande et al. (2023)	South Africa (Eastern Cape)	Cross-sectional survey; structural equation model	Financial literacy, inclusion, livelihoods	JBI cross-sectional checklist	Some
6	Akenzua (2025)	Sub-Saharan Africa	Systematic review	Digital banking, gender gap	AMSTAR 2	Some
7	Akinyemi & Mushunje (2020)	Rural Africa	Review of adoption determinants	Adoption determinants	AMSTAR 2	Some
8	Akomea-Frimpong et al. (2019)	Ghana	Exploratory qualitative study	Fraud control	JBI qualitative checklist	Some
9	Ali et al. (2020)	Uganda	Exploratory security evaluation	Security threats	JBI qualitative checklist	Some
10	Asongu & le Roux (2023)	Sub-Saharan Africa	Cross-country regression	Inequality, poverty	ROBINS-I (adapted)	High
11	Asongu & Odhiambo (2019)	Developing economies (incl. SSA)	Cross-country regression	Inequality, poverty	ROBINS-I (adapted)	High
12	Baganzi & Lau (2017)	Uganda	Cross-sectional survey; structural equation model	Trust, risk, adoption intention	JBI cross-sectional checklist	Some
13	Batista & Vicente (2020)	Mozambique	Field randomized controlled trial	Savings, welfare	RoB 2	Low
14	Batista & Vicente (2023)	Mozambique	Field randomized controlled trial (working paper)	Savings, investment, consumption, remittances	RoB 2	Some
15	Blumenstock et al. (2016)	Rwanda	Call-record data; natural experiment (earthquake)	Risk sharing via airtime transfers	ROBINS-I	Some

16	Bongomin et al. (2018)	Sub-Saharan Africa (as reported)	Cross-sectional survey; moderation analysis	Social networks, inclusion	JBI cross-sectional checklist	Some
17	Demirgüç-Kunt et al. (2018)	Global (incl. SSA)	Global Findex survey database	Account ownership (data source)	Not applicable	NA
18	Demirgüç-Kunt et al. (2022)	Global (incl. SSA)	Global Findex survey database	Account ownership, gender gap (data source)	Not applicable	NA
19	Dubus & Van Hove (2019)	Kenya	Survey of M-Pesa users	Savings behavior	JBI cross-sectional checklist	Some
20	Economides & Jeziorski (2015)	Tanzania	Market-structure analysis (working paper)	Market structure, pricing	ROBINS-I (adapted)	Some
21	Gosavi (2018)	Eastern Sub-Saharan Africa	Firm survey regression	Access to finance, productivity	JBI cross-sectional checklist	High
22	Grzybowski (2015)	South Africa	Econometric analysis of survey data	Phone adoption, network effects	JBI cross-sectional checklist	Some
23	Grzybowski et al. (2023)	Sub-Saharan Africa	Multi-country survey analysis	Adoption determinants	JBI cross-sectional checklist	Some
24	Hamdan et al. (2022)	Uganda	Household survey	Active use, inclusion	JBI cross-sectional checklist	Some
25	Hornuf et al. (2025)	Sub-Saharan Africa	Systematic review and meta-analysis	Adoption determinants	AMSTAR 2	Some
26	Hundie & Tulu (2023)	Ethiopia	Decomposition analysis of survey data	Gender gap	JBI cross-sectional checklist	Some
27	Jack & Suri (2014)	Kenya	Household panel; agent-proximity identification	Risk sharing, remittances	ROBINS-I	Some
28	Jallow & Tajmouati (2025)	West and Central Africa	Binary models with cross-validation (preprint)	Determinants of inclusion	JBI cross-sectional checklist	Some
29	Johnen et al. (2025)	Kenya	Repeated cross-sections; decomposition	Rural-urban inclusion gap	JBI cross-sectional checklist	Some
30	Kulu et al. (2022)	Ghana	Aggregate time-series analysis	Banking-sector performance	ROBINS-I (adapted)	High
31	Lorenz & Pommet (2021)	Kenya, Uganda, Tanzania	Firm survey regression	Enterprise innovativeness	JBI cross-sectional checklist	High
32	Maniriho (2021)	Rwanda	Survey; endogenous switching regression	Savings	JBI cross-sectional checklist	Some
33	Mbiti & Weil (2011)	Kenya	Household survey analysis	Transfers, M-Pesa use	JBI cross-sectional checklist	Some
34	Mothobi & Grzybowski (2017)	Sub-Saharan Africa	Multi-country survey analysis	Infrastructure, adoption	JBI cross-sectional checklist	Some
35	Munyegera & Matsumoto (2016)	Uganda	Household panel; fixed effects, instrumental variables	Remittances, consumption	ROBINS-I	Some

36	N'dri & Kakinaka (2020)	Burkina Faso	Survey regression	Individual welfare	JBI cross-sectional checklist	Some
37	Nan & Park (2022)	Zambia	SME survey	Firm resilience (COVID-19)	JBI cross-sectional checklist	High
38	Nefla et al. (2026)	Africa	Bibliometric analysis (554 articles)	Research trends	AMSTAR 2	NA
39	Negera et al. (2025)	Ethiopia	Cross-sectional farm-household survey	Climate resilience	JBI cross-sectional checklist	High
40	Osabutey & Jackson (2024)	Africa	Thematic review	Themes, policy	AMSTAR 2	Some
41	Peruta (2017)	Cross-country	Cluster analysis of country data	Adoption, inclusion	ROBINS-I (adapted)	High
42	Riley (2018)	Tanzania	Household panel	Risk sharing, phone ownership effect	ROBINS-I	Some
43	Sarma & Pais (2011)	Cross-country	Index of financial inclusion (conceptual)	Concept (context)	Not applicable	NA
44	Sekabira & Qaim (2017)	Uganda	Cross-sectional farm survey	Marketing, off-farm income	JBI cross-sectional checklist	High
45	Suri (2017)	Global (review)	Narrative review	Overview (context)	AMSTAR 2	Some
46	Suri & Jack (2016)	Kenya	Household panel, 2008-2014	Poverty, gender	ROBINS-I	Some
47	Suri et al. (2021)	Kenya	Quasi-experimental analysis of digital loans	Credit, resilience	ROBINS-I	Some
48	Tabetando et al. (2022)	Uganda	Household panel	Phone ownership effect, welfare	ROBINS-I	Some
49	Tiwasing et al. (2024)	Kenya	Firm survey regression	Business performance	JBI cross-sectional checklist	High
50	Twumasi Baffour et al. (2021)	Ghana	Household survey; selection-corrected models	Remittances, welfare	JBI cross-sectional checklist	Some
51	Wakaba & Wepukhulu (2019)	Kenya	Descriptive and regression analysis	Financial inclusion	JBI cross-sectional checklist	High
52	Yao et al. (2023)	Kenya	Household panel	Household resilience	ROBINS-I	Some
53	Yimam (2023)	Ethiopia	Conference paper; case study	Barriers to inclusion	JBI qualitative checklist	High
54	Zins & Weill (2016)	Africa (37 countries)	Global Findex probit analysis	Determinants of inclusion	JBI cross-sectional checklist	Some

Appendix B. PRISMA 2020 checklist (location of each item)

Item	Topic	Location
1	Title	Title page
2	Abstract	Abstract
3	Rationale	1.1
4	Objectives	1.2, 1.3
5	Eligibility criteria	3.3
6	Information sources	3.4
7	Search strategy	3.5, Appendix C
8	Selection process	3.6
9	Data collection process	3.7
10	Data items	3.7
11	Study risk-of-bias assessment	3.8
12	Effect measures	3.9
13	Synthesis methods	3.9
14	Reporting bias assessment	3.10
15	Certainty assessment	3.10
16	Study selection	4.1, Figure 1, Table 4, Appendix C
17	Study characteristics	4.2, Appendix A
18	Risk of bias in studies	4.3, Table 6, Appendix D
19	Results of individual studies	4.4-4.6, Tables 7 and 9
20	Results of syntheses	4.4-4.6
21	Reporting biases	4.7
22	Certainty of evidence	4.7, Table 9
23	Discussion	5, 6
24a	Registration	3.2: not registered
24b	Protocol	3.2: none
24c	Amendments	3.2: post hoc changes listed
25	Support	Declarations
26	Competing interests	Declarations
27	Availability of data and code	Declarations; Supplementary File S1

Appendix C. Search and screening log

Table C1: Search strings (2010-2026; English)

No.	Topic	Search string
1	Core	("mobile money" OR "M-Pesa" OR "mobile banking") AND "financial inclusion"
2	Core	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("account ownership" OR "financial access")
3	Country: Kenya	("mobile money" OR "M-Pesa" OR "mobile banking") AND "financial inclusion" AND Kenya
4	Country: Uganda	("mobile money" OR "M-Pesa" OR "mobile banking") AND "financial inclusion" AND Uganda
5	Country: Tanzania	("mobile money" OR "M-Pesa" OR "mobile banking") AND "financial inclusion" AND Tanzania
6	Country: Rwanda	("mobile money" OR "M-Pesa" OR "mobile banking") AND "financial inclusion" AND Rwanda
7	Country: Ethiopia	("mobile money" OR "M-Pesa" OR "mobile banking") AND "financial inclusion" AND Ethiopia
8	Country: Ethiopia	TeleBirr AND ("financial inclusion" OR "digital payments") AND Ethiopia
9	Region	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("East Africa" OR "Eastern Africa")
10	Gender	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("gender gap" OR "gender inequality" OR women) AND "financial inclusion"
11	Review	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("systematic review" OR PRISMA OR "meta-analysis")
12	Poverty	("mobile money" OR "M-Pesa" OR "mobile banking") AND (poverty OR welfare)
13	Remittances	("mobile money" OR "M-Pesa" OR "mobile banking") AND remittances
14	Risk sharing	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("risk sharing" OR "consumption smoothing")
15	Agent banking	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("agent banking" OR "agent network")
16	COVID-19	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("COVID-19" OR pandemic)
17	Digital divide	("mobile money" OR "M-Pesa" OR "mobile banking") AND "digital divide"
18	Security	("mobile money" OR "M-Pesa" OR "mobile banking") AND (security OR fraud)
19	Trust	("mobile money" OR "M-Pesa" OR "mobile banking") AND (trust OR "risk perception")
20	Firms	("mobile money" OR "M-Pesa" OR "mobile banking") AND (firm OR SME OR enterprise) AND performance
21	Savings and credit	("mobile money" OR "M-Pesa" OR "mobile banking") AND (savings OR credit OR loans)
22	Adoption	("mobile money" OR "M-Pesa" OR "mobile banking") AND (adoption OR determinants OR usage)
23	Region	("mobile money" OR "M-Pesa" OR "mobile banking") AND "Sub-Saharan Africa"
24	West Africa	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("West Africa" OR Ghana OR Nigeria OR "Burkina Faso" OR "Côte d'Ivoire")
25	Central Africa	("mobile money" OR "M-Pesa" OR "mobile banking") AND ("Central Africa" OR Cameroon OR "Democratic Republic of Congo")

Appendix D. Domain-level risk-of-bias judgments by design

Table D1 records the domain judgments behind the overall ratings in Appendix A. The overall rating of a study equals its most severe domain judgment. Judgments are made at design level from the reported methods.

Table D1: Domain-level judgments by design category

Design	Confounding or selection	Measurement	Missing data	Selective reporting	Overall
Randomized trials	Low (both trials)	Low (2020); some concerns (2023): self-reported outcomes	Low (2020); some concerns (2023): attrition	Low (2020); some concerns (2023): working paper	Low (2020); some concerns (2023)
Panel or quasi-experimental studies	Some concerns: residual confounding; agent placement not random	Some concerns: self-reported or proxy outcomes	Some concerns: panel attrition	Some concerns	Some concerns
Cross-sectional or repeated cross-sectional studies	High where causal claims are made; some concerns for associational designs	Some concerns: self-report	Some concerns: non-response	Some concerns	Some concerns to high
Qualitative or exploratory studies	Some concerns: purposive samples	Some concerns	Not applicable	Some concerns	Some concerns to high
Aggregate or cross-country studies	High: reverse causality, omitted variables	Some concerns: aggregate proxies	Not applicable	Some concerns	High
Systematic, narrative or bibliometric reviews	Not applicable	Some concerns: limited appraisal of primary studies	Not applicable	Some concerns: search coverage	Some concerns (bibliometric review not appraised)
Data sources or conceptual papers	Not applicable	Not applicable	Not applicable	Not applicable	Not appraised