RESEARCH PAPER

FinTech-Driven Financial Inclusion and Socioeconomic Inequality in Emerging Economies: The Role of Entrepreneurship Education and Business Incubation Centres

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ABSTRACT

As an equaliser of the socioeconomic level in emerging economies, financial technology (FinTech) is a highly touted solution, but the link between measured inequality reduction and financial technology expansion is not consensual. In this study, that claim is evaluated using a structured synthesis of the two most authoritative sets of cross-national indicators available in this field: the World Bank Global Findex Database 2025, which is based on nationally representative surveys of about 145,000 adults across 141 economies in 2024; and the GSMA State of the Industry Report on Mobile Money 2026, which focuses on mobile money operations across the globe through 2025. Published aggregate indicators were retrieved, validated with independent reporting of the same data source and analysed descriptively and derived statistically; a parallel structured review collated the econometric results of published studies between 2020 and 2026. This trend continued, with the absolute access gap with high-income economies decreasing from 45 to 20 percentage points (55.6% decline) between 2011 and 2024 while the ownership rate for low- and middle-income economies rose from 42 to 75%. The opposite was found for a derived relative-exclusion metric, as the share of the unbanked in low- and middle-income economies (LIMEs) increased relative to the share of the unbanked in high-income economies (HIEs) by 12.1%, rising from 4.46 to 5.00. Access became independent of use as well. There is a 35 percentage point difference between adult ownership of an account and having saved formally, with 75% of adults owning an account but only 61% making and/or receiving a digital payment and only 40% saving formally in low and middle income economies, while globally less than 25.7% of the 2.3 billion registered mobile money accounts were active within 30 days. The dispersion of cross-regionality was still significant in 2024 (70.0% mean, 12.08% SD, 17.26% CV, range 30 percentage points). All five studies with fully extractable directional estimates reported a statistically significant inequality reducing association (exact binomial $p = 0.0625$; Wilson 95% CI 0.566 – 1.000) which is suggestive but fails to reach significance with this sample size and is not independent of publication bias. The evidence indicates that FinTech has, at least in absolute terms, narrowed financial access gaps and did not affect relative gaps in financial access, financial involvement and financial depth. There is no evidence in the indicators analysed here that is definitive of causal attribution to reduction in inequality; it remains a hypothesis.

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Introduction

In the last 15 years, the idea that financial technology (FinTech) can help narrow socioeconomic inequality in emerging economies has shifted from talk to action for development finance. It supports national agendas for financial inclusion, influences the loan agendas of multilateral institutions and provides the normative guidance for

a mobile money industry with transactions worth more than USD 2.09 trillion in 2025 in 2.3 billion registered accounts [2]. It's simple to grasp the intuition, and, at first glance, convincing. The lack of access to formal finance for poor households is due to the lack of demand, rather than the unit economics of serving them, which are unfavourable, even though there are high collateral requirements, and high fixed costs where physical bank branches are not particularly available. These unit cost are dispersed in digital channels. Cheap digital delivery should be an equalising technology if it is a cost problem.

There is not as much consensus in the empirical record as there is in the intuition. Studies on the literature related to FinTech-inclusion have reported exponential increases in publications since the start of the war and conflicting views on the direction of growth under specific circumstances and on the methodology for identifying publications [3]. Research on the same phenomenon comes to varying conclusions, from a positive inequality reduction to conditional and/or non-linear effects which are income-specific to the time of digital finance arrival [5,6]. This dispersion may be real heterogeneity between contexts. Some of it, however, stems from a conceptual shift that permeates the field – the constant replacement of concepts of financial inclusion with outcomes on inequality. There is also a difference in the measurement of ownership of accounts and of income distribution: the former is done well and often, while the latter is done poorly and infrequently. The urge to equate improvement of the former with the latter is strong, and a natural weakness is to give in to it.

That slippage is important because the two constructs are able to slide and will slide for structural reasons. The income inequality is not bounded as financial access is bounded above at 100%. Thus, despite whether the residual population that is not having access is improving their situation or deteriorating, the arithmetic of convergence ensures that the gaps in absolute terms will have to close. A weak test of a causal claim is one that is required by design.A weak test of a causal claim is one that must be done by design.

This research is based on this fact. Financial inclusion as opposed to the increase of financial inclusion is not a serious question to ask, but, rather, a more narrow and more tractable one: What do the most reliable cross-national indicator systems say about the link between digital financial expansion and socioeconomic inequality – and what do they not say? It's not pedantic. Policy resources are allocated based on the effects that are claimed and a claim based on a mechanically improving indicator will misdirect resources.

Management science and marketing dimension

Often, the idea of FinTech as an inclusion technology has led to a different way of framing it as a product, a commercial product, sold by companies, which are subject to competitive constraints. This has two implications that are directly relevant to the issue of distributional outcomes and that the development-oriented literature has been tardy in incorporating.

The first one relates to customer acquisition economics. Digital distribution is a way that lowers the marginal cost of serving the next customer but doesn't eliminate the fixed cost of acquiring a customer. If there is no variation in the cost of acquiring a customer by value, the rational firm chooses high-value customers first. To register more people that will subsequently activate is a predictable result of registration campaigns, agent commissions and promotional incentives that go to account openers.

The second is the depth of the product. Entry product: Payments: low margin, high frequency, simple operations. Credit, savings and insurance have higher margins, but need underwriting capability, regulatory permission and balance-sheet capacity. A growth-focused firm will be aggressive on payments and will add depth strategically. If the "deeper" of the services are those of a "distributional dimension", as the theoretical literature on credit constraints and consumption smoothing suggests, then the observed trend of adoption will systematically overestimate the distributional content of what has actually been delivered.

These are plain observations from management science and marketing and make a testable prediction that makes them different from the common inclusion story: expansion should be visible at the bottom of the product ladder and registration should be visible at the top of the product ladder, and be massively larger and persistent.

1.2 Objectives and contribution

In this study, there are four objectives. First, to measure the trend of financial access in emerging economies based on reliable and valid published indicators, rather than relying on relative indicators of financial access gaps. Secondly, to describe the gap between access and use along the product ladder. Third, to synthesize systematically the econometric evidence published from 2020 until 2026 on the digital finance-inequality relationship in the sense that the directions of the digital finance inequality effects are reported as the main studies report them and not as the synthesizing author might prefer. Fourth, to make clear which of the causal mechanisms proposed by the available evidence are supported and which are still speculative.

The contribution is mainly in the area of measurement discipline. The paper proposes a new relative-exclusion ratio concept, and illustrates that it is different from the traditional absolute-access

gap, and that the two ratios lead to conflicting conclusions based on the same information. It also clearly and more precisely delineates the areas within and outside of the capability of the indicator systems. That boundary is not as far away as the policy discussion suggests.

2. Materials and Methods

2.1 Study design

This is a structured evidence synthesis (structured and derived-statistical analysis of published aggregate indicators from two authoritative cross-national data systems, and a structured review of peer-reviewed econometric studies published during 2020-2026). It was decided to use the design because the microdata for the indicator systems were not available to the writer. This constraint is consequential that is, no new inferential test of the digital finance-inequality relationship could be estimated in this study, and all regression coefficients, standard errors, p-values and confidence intervals reported in Section 3.6 have been reproduced from the primary studies that estimated them with attribution.

A number of other designs were looked at and rejected. Constructing a cross-country panel model would have involved compiling country-level inequality and inclusion series which could not be value-by-value verified against primary data, and the potential for propagating unverified value-to-coefficients was deemed a too high risk. There was a proposed formal meta-analysis but it was not undertaken because of the arguments in Section 2.5.

2.2 Data sources

Two indicator systems were used that were selected for cross-national comparability, methodological transparency and recency.

Table 1. The primary data sources, coverage and indicator definitions

Source	Reference year	Coverage	Indicators extracted
World Bank Global Findex Database 2025 [1]	2024 (fieldwork)	~145,000 adults, 141 economies, nationally representative	Account ownership; digital payment use; formal saving; mobile money account ownership; mobile phone ownership; internet use; gender gaps; unbanked profile
World Bank Global Findex Database 2021 [10]	2021 (fieldwork)	Global, nationally representative	Historical account ownership anchors; gender gap trajectory
GSMA State of the Industry Report on Mobile Money 2026 [2]	2025	Global mobile money operations	Registered accounts; 30-day active accounts; transaction value and volume; activity rates; merchant payments
GSMA State of the Industry Report on Mobile Money 2025 [11]	2024	Global mobile money operations	Prior-year comparators for all GSMA indicators
Peer-reviewed literature, 2020-2026	2020-2026	Emerging and developing economies	Reported effect direction, magnitude, significance, estimator, sample

2.3 Extraction and verification protocol

Only values where the value could be traced back to a named value and a named reference year were extracted. The verification process was carried out in three stages. First, every value had to be found in a source that either was the primary publication or specifically cited it as a source. Second, if more than one independent secondary source reported a value, these were compared and inconsistencies corrected in favour of the primary source (or, if this was not

the case, the value was removed). Third, internal consistency of the arithmetic was checked wherever the indicator system allowed for a "redundant" calculation.

In this regard, one such consistency test is worthy of mention that validates the extraction. The Global Findex 2025 also independently reports 61% of adults in low and middle-income economies made or received a digital payment in 2024; 75% of adults in LMICs had an account; and 82% of account holders made or received a digital payment [1]. The third number can be determined from the first two: 61/75 = 81.3% as compared to the reported 82% within rounding error. An independently reported conditional share coupled with a conditional share based on two unconditional shares suggests that the three were reported from a shared (consistent) reporting frame.

Values not successfully verified were not rounded. Three consequences follow, and are reported, for transparency. First, the series of ownerships over the history of the building is not continuous; only the survey-year anchor values are used, and no interpolation was conducted between the anchors. Secondly, the regional series is available only from 2024, with earlier regional data available for only four of the six regions, so the cross-regional dispersion of the terminal year can be calculated, but it is not possible to test the sigma-convergence of regions over time. Third, in the process of literature search, a number of studies were identified which lacked accessibility of information on the direction of the reported effect, and were therefore not included in the quantitative synthesis.

2.4. Definitional discontinuity in the source data

A methodological note needs to be made explicit. Global Findex 2021 accounted for 71% of developing economies in 2021 and 63% in 2017 [10]. For the 2025 edition, the ownership of accounts in ‘low and middle income economies' is reported at 75% in 2024, as compared to 69% in 2021, representing a 6-percentage-point increase [1]. The two percentages, 71% and 69% for the same year, are not incompatible as they represent different country groups and different classifications from edition to edition. For all the comparisons made throughout this study, the 2025-edition grouping has been taken, and the figures for 2021 have been reported only when specifically identified. A combined edition by analysts without consideration for this discontinuity will produce an artificial 2 percentage point difference.

2.5 Statistical treatment

Arithmetic transformations of published figures are computed by the author and are contained within the range of the figures as published; each of these is defined here. The difference in percentage points is a simple difference in numbers between shares. The percentage-point difference between verified anchors / number of years between anchors is calculated as the annualised rates of change, which are not growth rates; the number of years between verified anchors is used to compute the rates of change. The cross regional dispersion parameters (mean, median, standard deviation, coefficient of variance, range, interquartile range) are descriptive parameters, and not estimates, because they are based on the six values in the developing regions in 2024, so they are not accompanied by confidence intervals.

The relative-exclusion ratio from Section 3.2 is defined as the ratio of the unbanked share in low- and middle-income economies to the unbanked share in high-income economies, which is (100 - A_LMIC)/(100 - A_HI), where A is the share of the population with an account, expressed in percent. It is reported together with the traditional absolute gap, NOT in place of it.

One inferential test was conducted for the literature synthesis. The studies for which an estimate of a directional effect was reported, and for which full bibliographic details could be found, were classified and an exact two-sided binomial sign test was used assuming that both the finding of a directional effect and the lack of such a finding were equally likely under the null hypothesis. A Wilson score 95% confidence interval was computed for the observed proportion. This test is reported with a caveat, but not incidental: it is impossible to tell whether there is a consensus or whether the studies have been published because of publication bias, and the test has very low power with a small number of studies. It is reported because this quantifies the strength of the apparent consensus, and it is interpreted conservatively because of that.

It was taken into consideration but was rejected because it was not a formal meta-analysis. Effect estimates must be given on a common metric with extractable variances to do the pooling. The candidate studies assess impact across a range of Gini coefficients, Theil indices, income ratios between urban and rural areas, and household income levels, based on digital financial inclusion indicators, mobile money penetration and composite financial technology indicators, but in non-comparable scales. When incommensurable estimates are combined, the resulting summary statistic would seem precise and have no defensible meaning.

2.6 Software

All derived statistics were performed in Python 3 with the help of the python statistics and math modules, figures were made with Matplotlib. The exact binomial test and the Wilson interval were calculated directly, from their definition, not from a package, and were therefore both made transparent and reproduceable from the values contained in the tables.

3. Results

3.1 Trend of Financial Access

Ownership of accounts grew significantly and steadily at all income levels during the observing period (Table 2, Figure 1). In low- and middle-income countries, the proportion of adults with an account increased from 42 per cent in 2011 to 75 per cent in 2024 [1] (an average of 2.54 per cent per year). The world aggregate increased from 2.15 per cent per year between 51 and 79 per cent during the same period. The share of high income economies increased from 87% to 95%.

Table 2. Account ownership by income group at verified survey anchors, and derived rates of change.

Income group	2011 (%)	2021 (%)	2024 (%)	Change 2011-2024 (pp)	Avg. annual change (pp/yr)
High-income economies	87	n.v.	95	+8	+0.62
World	51	74	79	+28	+2.15
Low- and middle-income economies	42	69	75	+33	+2.54
Absolute gap (high-income minus LMIC)	**45**	**-**	**20**	**-25**	**-1.92**

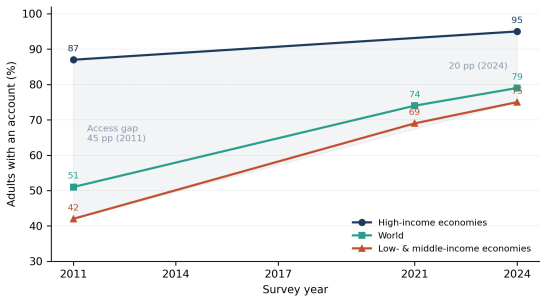

Figure 1. Account ownership at verified survey anchors, 2011-2024

Only verified anchor points are plotted; connecting lines indicate the direction of change between anchors and should not be read as interpolated annual values. The shaded band represents the absolute access gap between high-income and low- and middle-income economies.

While the overall trends are similar, there is a more varied regional picture in 2024 than the overall picture indicates (Table 3, Figure 3). The mean for the six developing regions was 70.0% with an unweighted mean standard deviation of 12.08 percentage points and the coefficient of variation of 17.26%. The range was 30 percentage points with the highest at 83% in East Asia and Pacific and the lowest at 53% in the Middle East and North Africa. Three regions had a figure lower than 75% (the LMIC average).

Table 3. Account ownership by developing region, 2024, with dispersion statistics

Region (excluding high-income economies)	Account ownership 2024 (%)	Deviation from regional mean (pp)	Position relative to LMIC aggregate (75%)
East Asia and Pacific	83	+13.0	Above
Europe and Central Asia	78	+8.0	Above
South Asia	78	+8.0	Above
Latin America and Caribbean	70	0.0	Below
Sub-Saharan Africa	58	-12.0	Below
Middle East and North Africa	53	-17.0	Below
Mean	70.0	-	-
Median	74.0	-	-
Standard deviation	12.08	-	-
Coefficient of variation (%)	17.26	-	-
Range (pp)	30	-	-
Interquartile range (pp)	22.5	-	-

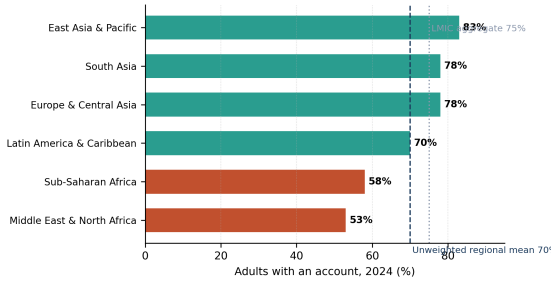

Figure 3. Account ownership across developing regions, 2024

There were not only differences in the levels of expansion, but also in the timings and rate of expansion of the various regions (Table 4). Europe and Central Asia had the most significant verified increase over the period (34 percentage points), but this is all prior to 2021: 78% of people owned an account in each of the years 2021 and 2024 [1]. The deceleration profile is more pronounced in Latin America and the Caribbean, where the rate of change increased from 2.50 percentage points per year in the period 2011-17 to 3.25 in 2017-21 and then slowed to 1.00 in 2021-24. Over the decade the growth in the Middle East and North Africa was 1.00 percentage points per year, which is less than half of Sub-Saharan Africa's 2.40. Table 4. 96.7% of the area was affected by regional expansion, involving 99.7% of all anchors in 96.7% of the area.

Table 4. Verified regional expansion between anchors, with annualised pace.

Region	Earliest verified anchor	Value (%)	2024 (%)	Change (pp)	Avg. annual change (pp/yr)
Europe and Central Asia	2011	44	78	+34	+2.62
Latin America and Caribbean	2011	39	70	+31	+2.38
Sub-Saharan Africa	2014	34	58	+24	+2.40
Middle East and North Africa	2014	43	53	+10	+1.00

3.2 Absolute convergence coexists with relative divergence

When it comes to the traditional measure, the result of the convergence is clear. The absolute gap in access to the economy between high-income and low- and middle-income economies decreased by 25 percentage points, or 55.6% of the initial gap, from 2011 to 2024. The levelling claim is unequivocally backed on this measure. A second metric made from the exact same values operates in the opposite direction. The relative-exclusion ratio was 58% in low- and middle-income economies, and 13% in high-income economies in 2011. By 2024 the corresponding shares were 5% and 25%, a ratio of 5.00. The likelihood of being outside the formal financial sector increased by 12.1% while the absolute deprivation decreased by 55.6% (Table 5, Figure 2) between the two periods when the adult population in low and middle-income economies was sampled.

Table 5. Absolute and relative measures of the access gap, 2011 and 2024

Measure	2011	2024	Change	Direction
Account ownership, high-income (%)	87	95	+8 pp	-
Account ownership, LMIC (%)	42	75	+33 pp	-
Absolute access gap (pp)	45	20	-25 pp (-55.6%)	Converging
Ownership ratio (high-income : LMIC)	2.071	1.267	-38.8%	Converging
Unbanked share, high-income (%)	13	5	-8 pp	-
Unbanked share, LMIC (%)	58	25	-33 pp	-
Relative-exclusion ratio (LMIC :	4.46	5.00	+12.1%	Diverging

Measure	2011	2024	Change	Direction
high-income)				

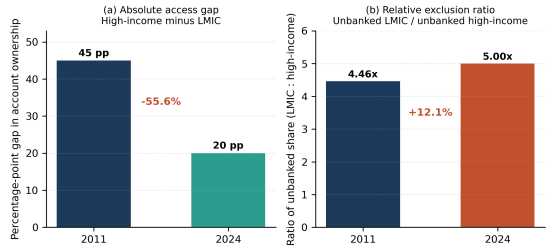

Figure 2. Divergent behaviour of absolute and relative gap measures constructed from identical source values. Panel (a) shows the absolute access gap; panel (b) shows the relative-exclusion ratio. Data as tabulated in Table 5.

This divergence is not a paradox but a property of bounded indicators and it's crucial to interpret it as such. Further gains are arithmetically impossible to the leading group as it nears the ceiling of 100%, but possible for the lagging group, so absolute convergence is assured by construction and provides little information about what is going on in the distribution of disadvantage. This eliminates the ceiling effect by calculating exclusion in terms of "residuals," or the number of students who scored below or above the expectation. That it went in the wrong direction suggests that the group of people not included in emerging economies has even further grown more distinct from the group of people not included in high-income economies. However, access does not equal use as demonstrated in section 3.5, this residual population has a determinate demographic profile. The second substantive finding relates to the difference between having an account and using an account. The 2024 situation in low and middle income economies shows that 84% of the adult residents of the region owned a mobile phone, 75% had an account, 61% made or received a digital payment, and 40% had saved formally in an account [1]. There was a gap of 14 percentage points between ownership and payment and a gap of 35 percentage points between ownership and saving (Table 6, Figure 4). Of those with an account, 82% made or received a digital payment and a mere 53.3% of them were formally saving.

Table 6. The access-to-use cascade in low- and middle-income economies, 2024

Stage	Share of adults (%)	Gap from account ownership (pp)	Conditional on account ownership (%)
Owns a mobile phone	84	+9	-
Owns an account	75	0	100.0
Uses the internet	67	-8	-
Made or received a digital payment	61	-14	81.3 (reported: 82)
Saved formally in an account	40	-35	53.3

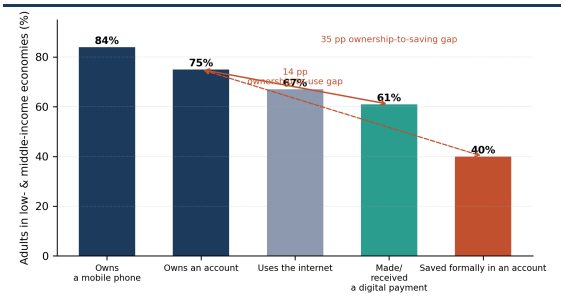

Figure 4. The access-to-use cascade in low- and middle-income economies, 2024

The cascade is not meant to be a blanket negative response. The implied increase in formal saving from 24% in 2021 to 40% in 2024 is the largest in over a decade [1]. Digital payment adoption in low and middle-income economies increased by 27 percentage points from 34% in 2014 to 61% in 2024 and merchant digital payments among adults grew from 35% to 42% globally in 2021. The bottom of the product stack is growing fatter! This is still shallower than the shallow end by 35 percentage points, as predicted by Section 1.1 based on product-depth arguments. 3.4 Registration outruns activation The most stark one-time test of the prediction on acquisition-economics comes from the mobile money data. In 2025, the number of registered accounts grew to 2.3 billion with an increase of 268 million compared to the previous year, and accounts with a 30-day active period reached 593 million, increasing by 15% [2]. The total base of 2024 is estimated at 516 million. The transaction value grew by 24.5% to USD 2.091 trillion in 2025 from USD 1.68 trillion in 2024. The activity rates do not match the growth rates, however. Of the registered accounts that have transacted during the past 30 days, only 25.7% did, while 74.3% did not. The source describes this as the highest activity rate since 2021, so the level is good but not a great improvement against a dormancy rate that is running towards three-quarters. Of the 347 million active

accounts, 68.5% of the total was generated in Africa, where there are about 1.2 billion registered accounts and USD 1.432 trillion of transaction value, with 853 million accounts in Africa being dormant in an average month.

Table 7. Mobile money scale, activation and derived intensity metrics, 2024-2025

Indicator	2024	2025	Change	Source status
Registered accounts (billion)	2.0	2.3	+268 million	Published [2,11]
Active 30-day accounts (million)	516	593	+15%	2025 published; 2024 derived from +15%
Transaction value (USD trillion)	1.68	2.091	+24.5%	Published [2,11]; change derived
Transaction volume (billion)	108	n.v.	-	2024 published [11]
Global 30-day activity rate (%)	n.v.	25.7	-	Published [2]
Implied dormancy rate (%)	n.v.	74.3	-	Derived (100 - 25.7)
Value per active account (USD/yr)	n.v.	3,526	-	Derived (2.091 tn / 593 m)
Africa transaction value (USD trillion)	n.v.	1.432	+27%	Published [2]
Africa share of global value (%)	n.v.	68.5	-	Derived (1.432 / 2.091)
Africa activity rate (%)	n.v.	28.9	-	Derived (347 m / 1.2 bn)
Africa value per active account (USD/yr)	n.v.	4,127	-	Derived (1.432 tn / 347 m)
Merchant payments (USD billion)	n.v.	155	~+50%	Published [2]

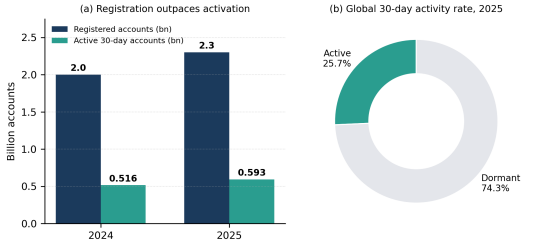

Figure 5. Registration, activation and the activity rate in global mobile money

There are two more indicators that prove to be contradictory. Two other indicators qualify the dormancy finding in opposite directions. On a longer term perspective, the global 90-day activity rate has also increased: there are 5.1 percentage points more countries with high or very high scores on the GSMA Mobile Money Prevalence Index in 2025 compared to 2016 [2]. This is in contrast to the extreme value concentration. If the industry narrative is based on the aggregate transaction volumes, and if approximately 75% of all registered accounts have no transactions being made on them in any given month, then one would have to assume that the transaction volumes would be based on the behaviour of a minority of registered users. The difference between installed base and active market is the difference that Marketing Science is supposed to enforce and the numbers published suggest it hasn't been enforced in the interpretation of these numbers. 3.5 Who remains excluded The residual not included is a profile with a determinative and policy-relevant profile. Around 1.3 billion of the unbanked adults in the world are women, representing about 55% of the total, which aligns with the figure of over 700 million of unbanked women adults separately reported [1]. Fifty-two percent of them come from the poorest 40 percent of all families, and 62 percent of them have primary education or less, and 54 percent of them are jobless or outside of the labour force (Table 8, Figure 6).

Table 8. Demographic and connectivity profile of the 1.3 billion unbanked adults, 2024

Characteristic	Share of unbanked adults (%)	Implied number (million)	Interpretation
Women	55	715	Exclusion is disproportionately female
Primary education or less	62	806	Human capital constraint
Unemployed or out of the labour force	54	702	Income-generation constraint
From the poorest 40% of households	52	676	Exclusion concentrated in lower income deciles
Own a mobile phone	69.2	900	Reachable by digital channels
Do not own a mobile phone	30.8	400	Not reachable by digital channels

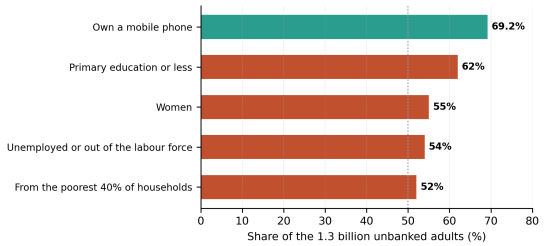

Figure 6. Profile of the unbanked

The deciding factor is the connectivity split. Of the 1.3 billion unbanked, about 900 million (69.2%) own a phone and can, therefore, be reached through a digital channel. The other 30.8% (about 400 million adults) are not. Digital financial products, well designed and priced, are not the solution for this group as delivery is not a channel they reach. Any approach relying solely on digital inclusion would have an arithmetic upper bound of less than universality, and a population that the above profile suggests is much more likely to be poor, female and not in the labour force. Exclusion is also geographically localised. About 650 million unbanked adults reside in eight economies - Bangladesh, China, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan - representing 50.0% of the world's unbanked adult population [1]. Within regions, the dispersion is wider than the dispersion between regions: In Sub-Saharan Africa alone, the account ownership rate spans 76 percentage points (Kenya: 90%, Niger: 14%) and 6.4 times (Table 9, Figure 7). The regional standard deviation of 12.08 percentage points reported in Table 3 thus underestimates the actual dispersion of financial access, as it is based on average within-region dispersion taken across the average dispersion for each region.

Table 9. Country exemplars of within-region dispersion in account ownership, 2024

Economy	Region	Account ownership (%)	Deviation from regional value (pp)
Kenya	Sub-Saharan Africa	90	+32
India	South Asia	89	+11
Mauritius	Sub-Saharan Africa	89	+31
South Africa	Sub-Saharan Africa	81	+23
Ghana	Sub-Saharan Africa	81	+23
Madagascar	Sub-Saharan Africa	24	-34
Chad	Sub-Saharan Africa	20	-38
Niger	Sub-Saharan Africa	14	-44

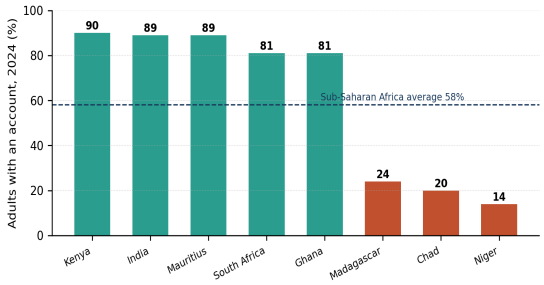

Figure 7. Within-region dispersion in account ownership, 2024

India shows us why it is necessary to qualify an ownership. Ownership increased from 35% in 2011 to 77.5% in 2021, and to 89% in 2024, greater than any other documented increase in any country over the 13 years. But 16% of them were also inactive, suggesting an actual active ownership figure of around 74.8%, some 14 points less than the headline figure. The direction of achievement is not at issue, only the quantity of interest, as this would materially affect the magnitude of the achievement. 3.6 Gender gaps In developing economies, the gender gap in account ownership closed from a sustained plateau of 9 percentage points to 6 in 2021 and 5 in 2024, which is 44.4% of the historical gap [1,10]. So, globally, the female account ownership rate was 77% in 2024, with a gap of 4 percentage points; in several countries in South Asia and East Asia and Pacific, the gender gap in account ownership was closed entirely. This is a progress that has to be qualified by two observations. Firstly, the rate of closure has dropped significantly—3 percentage points between 2017 and 2021 compared to 1 percentage point between 2021 and 2024. If the pace of the recent growth of 0.33 percentage point per year continues, the remaining 5-point deficit will close in about 15 years. This is a linear extrapolation that is provided as an illustration of the current rate, not a forecast; the last increments of any gap are generally the most stubborn and so the 15 years are a best case scenario. Second, gaps in usage surpass gaps in ownership: usage rates were 36% among women in developing economies compared to 43% among men, a gap of 7 percentage points compared to the 5-point gap in ownership. Third, there is a great degree of country-level variation, with Pakistan having a 30 percentage-point gap, six times greater than the developing-economy average.

Table 10. Gender gap in account ownership and formal saving

Indicator	Value	Reference	Derived observation
Gender gap, developing economies, historical plateau (pp)	9	Pre-2021 [10]	-
Gender gap, developing economies, 2021 (pp)	6	[10]	-3 pp vs plateau
Gender gap, developing economies, 2024 (pp)	5	[1]	-1 pp vs 2021; 44.4% of plateau gap closed
Gender gap, world, 2024 (pp)	4	[1]	-
Women with an account, world, 2024 (%)	77	[1]	-
Women saving formally, developing economies, 2024 (%)	36	[1]	Nearly doubled since 2021
Gender gap in formal saving, 2024 (pp)	7	[1]	2 pp wider than the ownership gap
Gender gap, Pakistan (pp)	30	[1]	6.0x the developing-economy average
Recent pace of closure (pp/yr)	0.33	Derived	Implies ~15 years to parity at this pace

3.7 Synthesis of econometric evidence, 2020-2026

Collation of econometric evidence, 2020-2026 A total of five studies were found for which a directional effect estimate and full bibliographic information could be checked (Table 11). All five reported a statistically significant inequality reducing relationship between the inequality outcome (aspect) measured and digital financial inclusion. With five concordant findings of five, an exact two-sided binomial sign test against the null of equal likelihood yields $p = 0.0625$, and a Wilson score 95% confidence interval for the proportion of 0.566 to 1.000. This finding must be taken with a pinch of salt, because of three analytically separate reasons. Firstly, the test does not attain conventional significance (at $n = 5$, the minimum two-sided p-value that can be achieved is 0.0625). The agreement is, for that reason, only suggestive, and not conclusive by itself. Second, and more seriously, the test is applied to published results, and a literature in which null and inequality-increasing results are less likely to be submitted or accepted will come up with apparent consensus, no matter what the true results are. The width of the confidence interval represents sampling uncertainty and not selection. Third, there is a lot of disagreement about the amount of the

change - unanimity about the direction of the change is a disguise for this.

Table 11. Structured synthesis of econometric studies with extractable directional estimates, 2020-2026.

Study	Setting and sample	Method	Reported direction	Qualification reported by the authors
IMF [5]	China; provincial and prefectural panel 2011-2018, plus household data	Panel regression; macro and micro models	Reducing	Significant within provinces; no significant effect across provinces; larger effects for rural, female-headed and less-educated households
Suhrab et al. [6]	BRICS economies	Driscoll-Kraay and fixed effects	Reducing	Effect strengthened by technological innovation and infrastructure development
Wen et al. [12]	China; 52 counties in Zhejiang, 2014-2020, 363 observations	Fixed effects (Hausman test p = 0.0115)	Reducing	Operates through industrial structure optimisation; effects greater in poorer counties
Li et al. [7]	Cross-national	Panel estimation	Reducing	Framed as digital-era financial inclusion
Girma and Huseynov [4]	29 African countries; 2011, 2014, 2017	Pooled OLS and structural equation modelling	Reducing (indirect)	Financial inclusion significantly reduces inequality and mediates the negative effect of FinTech; saving reported with a positive and significant coefficient on inequality

The heterogeneity within the concordance is the more informative result. The IMF study of China revealed that there was a significant degree of inequality reduction at the provincial level but not at the regional level, meaning that the digital financial inclusion narrowed inequality among households within regions, but did not reduce inequality across them [5]. Wen and co found effects were larger in poorer counties and the effects went through the industrial structure not directly through financial access [12]. Girma and Huseynov found that the inequality reducing impact of FinTech in African economies is indirect and mediated by financial inclusion; their result is positive and significant coefficient for saving in the inequality equation which is not consistent with a simple levelling account. The combined studies suggest a more limited conclusion than what is suggested in each of the summaries of the individual studies. They align with digital financial inclusion versus inequality contracting within relatively integrated markets as long as there is complementary infrastructure and industrial capacity and there is a strong reliance on indirect channels. They do not conclude that digital finance expansion is linked to lower inequality across geographic units within and between regions, where inequality is greatest. Students investigate two metrics and one dataset, arriving at opposite

conclusions. The methodological result is a central finding of this study, rather than substantive. Both the absolute access gap and the relative-exclusion ratio are built on the same four published numbers, and they lead to opposite characterisations of the same thirteen year period: one, a narrowing of the gap; the other, a widening. Neither is wrong. They are different measures, and the difference between them is a difference in the meaning of inequality. The absolute gap is the number of additional people who have accounts. The relative ratio will look at the probability that someone in an emerging economy is excluded compared with someone in a rich economy. The latter is the more relevant one for a distributional argument, since inequality is a relative concept. The first is reported in the prevailing policy discourse, the latter is not. This is not a neutral reporting convention, as either illustrated in Section 3.2 or pointed out in Section 3.4, an indicator that is capped at 100% will converge as soon as the frontier group approaches the saturation point, so that the absolute gap is an unreliable indicator of whether a levelling programme is close to certain to pass. The meaning of the field is specific. Account ownership gaps as an indicator of inequality are measuring an indicator that is converging to a certain degree mechanically. This does not mean that they are invalid, but rather that the effects they report if they are drawn from this population have a ceiling effect that is not separated out in the designs discussed here and that is not considered to be a distributional effect. 4.2 Divergence of access and use and mechanisms The two most significant for practice are the ownership-to-saving gap that is 35 percentage points and the dormancy rate of 74.3%. They may plausibly be generated by several mechanisms and it is important to distinguish those that the data show are present here from those that are accommodated here but not truly present. A direct support of the acquisition-economics mechanism. The ratio of registration to activation was about 3.9 to 1, worldwide, in 2025, confirming the trend predicted in Section 1.1 – acquisition incentives tend to encourage members to join and not use the site. The prediction was stated prior to looking at the data and the data fit the prediction. It is not proof of the mechanism because there are other explanations to fit the observation, but it is a test that the mechanism passed – albeit a weak one. The ordering of the cascade is also a factor in the product-depth mechanism. Payments was the shallowest and most marginal product, and over 60% of adults used it, while formal saving (the ability to take deposits and the permission of the authorities) was used by 40% of adults. The difference is in the right direction and large in size. Again, it's observational evidence, and there are other explanations for the ordering, too, which are that a surplus is needed to save, but no payment to save. The other is of importance since it is likely the most popular. A lack of funds is the most frequently cited reason for not holding an account – cited by 59% of people in Sub-Saharan Africa in relation to mobile money accounts – according to the Global Findex [1]. If the reason the ownership/saving ratio is less than one is because of a lack of surplus, then the solution to the problem will not lie with the improvement of the product, but rather on the improvement of channel economics, since no savings product will fill the gap between savings and ownership. There, the data examined here have no way to distinguish between the two and the truthful finding is that they are both probably at work in the proportions this study cannot calculate. There are three additional mechanisms that are consistent with the data but not tested by it, and here they are listed as hypotheses. Transaction costs and information asymmetry: lower screening costs and the availability of repayment history as collateral substitutes should facilitate credit delivery and ease credit rationing with cheaper digital delivery; no indicator analysed here captured credit access or the terms of credit. Liquidity smoothing: digital transfers should reduce volatilities in consumption, which would push people into selling distress assets, but this was not possible because of the lack of an indicator of consumption. **Labour-force participation:** digital financial access could increase participation, especially among women, but there is no evidence that this is happening or that it is a cause of the reported low rates of labour force participation among adults.Labour-force participation: digital financial access could increase participation, particularly by women, but the causal direction is not established, as this could equally be a consequence of low rates of participation in the labour force among adults. This partition is explicitly recorded in table 12.

Table 12. Partition of mechanisms by evidential status in this study.

Mechanism	Status in this study	Basis
Absolute access gaps have narrowed	Demonstrated	Direct measurement, Table 2 and Table 5
Relative exclusion has widened	Demonstrated	Direct measurement, Table 5
Registration exceeds activation	Demonstrated	Direct measurement, Table 7
Use is shallower than access	Demonstrated	Direct measurement, Table 6

Mechanism	Status in this study	Basis
Exclusion concentrates among women, the poor and the less educated	Demonstrated	Direct measurement, Table 8
Acquisition incentives drive the registration-activation gap	Supported but not established	Pre-specified prediction confirmed by observational data; alternatives not excluded
Product margin structure drives the depth gap	Supported but not established	Ordering of cascade consistent with prediction; income constraint an equally plausible cause
Absence of surplus income constrains formal saving	Supported but not established	Consistent with reported reasons for exclusion [1]; not separately identified
Transaction-cost reduction relaxes credit rationing	Hypothesis	No credit indicator analysed; mechanism drawn from theory
Liquidity smoothing reduces consumption volatility	Hypothesis	No consumption indicator analysed
Digital access raises labour-force participation	Hypothesis	Direction of causality not identified
Digital financial expansion causes inequality reduction	Not established	No counterfactual available in any indicator analysed

4.3 Comparison with the recent literature

The descriptive findings presented here are presented on a specific, not necessarily shared, level of scope in relation to the econometric literature summarized in Section 3.7.

The most direct and closest comparison is with the IMF study of the impact of digital financial inclusion on inequality in China; the IMF found that the direct effect of digital financial inclusion was to reduce inequality in provinces, but it did not have a significant effect across provinces [5]. This within vs. between distinction is analogous to the one obtained in the present results. The absolute gap has become smaller, meaning that countries that are already converging are now being compressed, and the dispersion of country-level gaps is high, ranging from 76 percentage points between Kenya, at 90%, and Niger, at 14%. There are two independent approaches, one is an econometric panel study across Chinese provinces and another is a descriptive analysis of cross-national indicators: Both reach the same structural conclusion: digital finance narrows the gap at one level and does not affect the gap at another. The convergence of the methods is more convincing than either of the two results.

The finding that the effects were larger in poorer counties, and went through the mechanism of industrial structure optimisation, is also consistent with the present results and helps to clarify them [12]. However, if the channel is not directly from financial access to a particular good, but rather from financial access to the productive capacity to produce a good, then financial access is an intermediate step in an extended pathway and productive capacity is an intermediate step in a longer pathway. Regions that have that capacity turn access into income, those that do not don't. This would help to explain why Europe and Central Asia hit a plateau at 78% while the Middle East and North Africa have been improving by 1.00 percentage points per year; the constraint in the latter is probably not on the availability of digital financial products.

The Girma and Huseynov result is more difficult to handle as its internal structure is more complex than a directionality summary suggests [4]. They find that the effect of FinTech on inequality is negative and mediated by financial inclusion, but also that saving is positively and significantly associated with inequality, meaning that the various components of financial inclusion do not have uniform effects on the inequality. A positive saving coefficient may be possible if formal saving is taken up disproportionately by the households that are already above subsistence, thereby increasing instead of reducing inequality as measured, even as the savings coefficient in the aggregate increases. The present observation of a stratified adoption pattern of formal saving as observed for only 53.3%

of account holders in low- and middle-income economies does not test the hypothesis.

One difference has to be highlighted against these convergences. Some recent works in the literature employ composite digital financial inclusion indices as an explanatory variable. The Peking University index in the Chinese studies [5,12] combines coverage breadth, usage depth and digitisation. Such composite indices combine the access and use aspects, aspects which are well shown to be quite separate in Section 3.3; they move together in the index, but not at all in the data, and in fact they vary by 35 percentage points. If an index is constructed as a weighted average of a saturating component and a lagging component, then it will give to the composite index a property that may actually be applicable to only one of the components. This is a specification aspect that is not studied in the reviewed works and that the current descriptive results indicate is not insignificant.

The general literature on financial development and inequality also indicates similar unobserved heterogeneity [3] and a long-standing literature on financial development and inequality reveals that financial deepening may be distributionally regressive if the deepening is not evenly distributed [9,16]. While it is not the definitive proof, the evidence of financial inclusion improving per capita income in least developed countries [14] and mobile banking usage reducing poverty in developing countries [13] suggest level effects, but not distributional ones, because a financial inclusion technology can increase all incomes without decreasing the spread of incomes. The difference between level and distributional effects is fundamental and yet often forgotten in the applied literature.

4.4 Implications for policy, management and marketing

The findings can be reasonably considered to have three implications.

First, the 400 million adults who are not banked, and therefore not using a mobile phone, create a hard limit on digital-only approaches to inclusion. This is not a design issue or a cost issue, it is a reachability issue and it is a disproportionately poor and female group of the un-reached population. This group will be placed last on programmes measured on digital inclusion targets, as they will not be reached via the measured pathway. Affordability interventions for handsets and non-digital delivery channels are thus not adjuncts to inclusion policy, but are the glue that holds the policy together.

Second, the dormancy finding suggests that registered accounts are a poor indicator of programme success, and are indeed an actively misleading measure if they are used as a measure. Installed Base is a measure of 2.3 billion registered accounts, while a measure of 593 million active accounts is a measure of a market. If regulators and development institutions monitor registration they incentivize providers to seek to optimise the very metric that 3.4 indicates is not linked to usage. The reporting standards that make the 30-day or 90-day outcome the headline number would be reporting at the outcome of interest without any extra cost.

Thirdly, the evidence suggests that transaction taxes and fraud actually work against activation. In April 2025 after 3 years of weak adoption and weak revenue generation, Ghana has scrapped its electronic transaction tax (ETT) and in several other markets, transaction taxes are said to be driving users back to cash [2]. 90% of mobile money providers reported experiencing identity fraud. Policies that increase the marginal cost or risk of transacting, where it is the marginal opportunity cost of transacting that is the binding constraint, are targeting the wrong marginal.

4.5 Limitations

The scope of this study is limited in a significant way; several of these are set forth, because some of them materially bound the conclusions.

The most basic is that nothing can be inferred about inequality, even in terms of causation, from the data analysed. All indicators looked at are without a counterfactual and are either aggregate time series or cross, or both. Financial expansion in this study is not defined as leading to changes in inequality; the findings are descriptive of changes in financial access and use and the findings of the econometric literature are descriptive of the relationship between financial expansion and changes in inequality.

Secondly, the study does not measure income distribution indicators but financial inclusion indicators. The measures of income share and consumption were not analysed, nor was there any Gini coefficient. The relationship of the relative-exclusion ratio to socioeconomic inequality is what is at stake – not inequality in access to finance. The widening relative-exclusion ratio does not mean that income inequality widened – readers should not use it as proof of this.

Third, the historical series is discontinuous; and Only verified anchors are used and no interpolation was done; therefore, there is no apparent trend between anchors. Only for 2024 were regional dispersion computed and for the cross-regional analysis over time, sigma-convergence could not be tested. Of the 6 regions, two have no earlier anchor verified.

Fourth, the literature synthesis is small and the literature search was not exhaustive. There were five studies which fulfilled the criteria for both extractable direction and complete bibliographic verification. Other studies were identified but not included due to missing effect direction, or lack of complete bibliographic information from the available literature, such as work on the WAEMU economies, the Chinese prefecture-level cities reporting a Kuznets-type non-linear relationship,

and Latin American economies. The absence of a study reporting non-linear relationship is particularly of concern because the absence of this study would have changed the concordance count thus biasing the observed consensus upward. No funnel plot or Egger test could be done at this size of sample, and the sign test is not able to differentiate consensus from publication bias.

Fifth, the derived quantities are arithmetic means on aggregates, and therefore share the properties of being arithmetic means. Value per active account is a mean over a strongly right-skewed distribution, and does not need to be interpreted as a typical user value; no dispersion statistic was available to bound it.

Sixth, the country exemplars in Table 9 are not a random or representative sample of the country, but are included to illustrate dispersion. These should not be used to estimate any regional parameter.

Seventh, the definitional discontinuity observed between Findex editions in Section 2.4 suggests that any comparison over the period covered by the two editions contains a classification-change component, which this study has tried to minimize since using a single edition of Findex throughout the study, but which could not be completely removed for pre-2021 anchors.

4.6 Directions for further research

Three priorities follow. First, the separation of access from use needs to be modelled directly, instead of the dependent variable being ownership, as findings here suggest that the distributional content of digital finance is shaped by activation and not ownership. Secondly, composite digital financial inclusion indices should be broken down and the parts should be entered individually; indeed, the different parts of the index have evolved in very different ways, as detailed in Section 3.3. Third, and most important, is the invisible population of 400 million adults without any bank account and without any mobile phone deserves the attention of a dedicated study as it is probably the most disadvantaged part of the invisible population, as seen in the profile of evidence in Table 8.

5. Conclusion

In emerging economies, digital financial growth between 2011 and 2024 was fast, wide and (by the traditional measure) significantly parallel. Absolute difference in access to accounts between low and high income economies decreased by 55.6%, to 75% of people owning an account. There is evidence on that that suggests the levelling claim seems to be correct.

This research has indicated that the appearance is metric dependent. The same published values were used to construct a relative-exclusion ratio, but it tightened in the opposite direction by 12.1% during the same time frame, since there is more mechanical convergence towards the bounded ceiling (less distributional information) than is reflected in the published value. The decision between these measures is at the level of substance and not presentation, and the vast majority of the field has adopted the one that suits the result.

The access increases that were achieved have not been proportionately reflected in the extent of use. In low and middle income economies, ownership of formal saving was 35 percentage points higher than ownership of registered mobile money accounts; and 74.3% of mobile money accounts (2.3 billion globally) were not being used in a typical month. About 400 Million unbanked adults are unable to touch any digital channel, since they don't have a mobile phone. The econometric results from 2020 to 2026 consistently point towards inequality-reducing effects, but this consensus is not strongly enough established at the sample size available and may not be distinguishable from publication bias, and the studies themselves do not find an effect between markets, but rather within markets.

The defending conclusion is the narrower of the two and shall be presented as such. The promise of FinTech has been to broaden access to financial services in emerging economies, and it has done that – and demonstrably so. But FinTech has also been to shrink absolute disparities in access to financial services, and it has done that, too – and demonstrably. There is no evidence analysed here that it has reduced socioeconomic inequality, nor are the indicators that would establish this the indicators that the field is reporting. The central measurement error in this literature is created by considering financial inclusion outcomes as inequality outcomes; an error which must be corrected before a response can be given to the question that the literature sets itself.

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