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CAN FINANCIAL INCLUSION REDUCE GENDER INEQUALITY? DYNAMIC PANEL EVIDENCE FROM DEVELOPING COUNTRIES

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ABSTRACT

Household studies show that women who gain a bank account or a savings product often gain more say over household spending but it is less clear whether wider financial access narrows gender gaps across a whole economy. This study examines the effect of financial inclusion on the UNDP Gender Inequality Index (GII) in 36 developing countries over 2000–2025. Financial inclusion is measured by an index built through principal component analysis from six IMF Financial Access Survey indicators, including mobile money agent outlets. Because gender inequality changes slowly and may itself affect access to finance, we estimate dynamic models with one-step and two-step difference and system GMM. Financial inclusion lowers the GII in all four estimators, with a coefficient of −0.352 in the two-step system GMM. A 0.1 rise in the index reduces the GII by 0.035 points in the first year, and because inequality is persistent (lagged coefficient 0.726), the implied long-run reduction is about 0.128 points, slightly more than one standard deviation of the index in the sample. In standardised terms, only the length of compulsory schooling has a larger effect. Higher fertility raises gender inequality, while longer compulsory schooling, faster growth and better governance reduce it. Expanding women's access to accounts and credit should be treated as a long-term gender policy and combined with education and legal reform.

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Introduction

In 2021 men in developing economies were still 6 percentage points more likely than women to hold an account at a bank or mobile money provider, although the gap had narrowed from 9 points in

earlier rounds of the Global Findex survey (Demirgüç-Kunt, Klapper, Singer, & Ansar, 2022). Behind the account gap lie wider gaps. Women in these economies are less likely to be in paid work, more likely to work informally, less likely to own land or a business, and less likely to hold political office (World Bank, 2012). Sustainable Development Goal 5 calls for equal rights for women to economic resources, including financial services, which treats financial access as part of gender equality itself.

There are good reasons to expect access to finance to help women. Sen (1990) argued that a woman's position in household bargaining depends on her outside options and on whether her contribution to the household is seen and valued. A private savings account gives a woman money that other household members cannot easily claim. Ashraf, Karlan, and Yin (2010) found that women in the Philippines who were offered a commitment savings account gained more decision-making power within the household, especially those who had less power at the start. Credit can let women start or expand small businesses, which matters where formal jobs for women are scarce (Demirgüç-Kunt, Klapper, & Singer, 2017). Swamy (2014) found that the income gains from financial inclusion programmes in India were larger for women than for men.

Most of this evidence comes from individual programmes and household surveys. Whether wider access to finance narrows gender gaps across a whole economy is a different question, and the answer is less obvious. An expanding branch network may serve men first, so national inclusion can rise while the gender gap in access stays the same or widens. Aterido, Beck, and Iacovone (2013) found that in Sub-Saharan Africa women use financial services less than men mainly because of lower income, education and formal employment, not because of gender as such. If finance follows women's economic position rather than changing it, more inclusion may not reduce inequality at all. Ayodeji, Akinyele, and Adegboye (2025) even found that more ATMs and bank branches were associated with lower female labour force participation in parts of Sub-Saharan Africa, which they linked to social norms and the size of the informal economy.

Cross-country studies that address this question are few, and most face two problems. First, gender inequality changes very slowly. Gaps in maternal health, schooling and political representation are built over decades, and a model that ignores this persistence will attribute to current variables what is really the effect of the past. Second, causality may run both ways: countries where women are more educated and more often employed will have more women demanding accounts and loans. Saha (2022) and Ohiomu and Ogbeide-Osaretin (2019) report that financial inclusion reduces gender inequality, but the first uses fixed-effects estimators that do not model the persistence of gender inequality and the second covers 17 countries over seven years.

This study asks three questions. Does financial inclusion reduce gender inequality in developing countries once the persistence of inequality and the endogeneity of finance are taken into account? How large is the effect in the short and the long run? And how does it compare with the effects of fertility, compulsory schooling, labour market conditions, growth and governance?

The paper contributes in three ways. First, it uses the GII, which combines reproductive health, empowerment and labour market participation, so the outcome reflects several dimensions of women's position rather than a single indicator. Second, it covers 36 developing countries over 26 years and uses difference and system GMM to deal with persistence and reverse causality, with checks for cross-sectional dependence and second-generation unit root tests. Third, it reports the long-run effect implied by the dynamic model and compares the standardised effect of financial inclusion with those of the other determinants of gender inequality, which tells policy makers how much weight financial access deserves next to education and demographic change.

The paper proceeds as follows. Section 2 reviews the literature. Section 3 sets out the data, model and method. Section 4 presents and discusses the results. Section 5 concludes.

Literature review

Theoretical background

Three bodies of theory link finance to gender inequality. The first is the bargaining approach to the household. In Sen's (1990) account of cooperative conflict, the outcome of household bargaining depends on each member's fallback position and on how far their contribution is recognised. Income that a woman earns or controls herself raises her fallback position. Financial services that are individual and private, such as an account in her own name, make it harder for others to take that income and so strengthen her position.

The second is the capability approach. Sen (1999) defines development as the expansion of what people are able to do and be. For women, access to credit and savings widens the set of choices open to them: to start a business, to pay for a daughter's schooling, to travel to a clinic. Kabeer (1999) breaks women's empowerment into resources, agency and achievements, and access to finance is a resource that can raise agency only if women can actually use it.

The third is household economics and human capital theory. Becker (1981) explains how the division of labour within households, together with childbearing, leads women to specialise in unpaid work. High fertility increases this specialisation, while education raises the return to women's paid work and so the cost of staying at home (Becker, 1964). Finance can shift these choices by letting women invest in their own skills and businesses. Institutions matter too: laws on property, inheritance and discrimination shape what women can do with financial resources, and those laws count only if they are enforced (North, 1990; World Bank, 2012).

Evidence on gender gaps in financial access

A large micro literature documents who is excluded. Abdu, Buba, Adamu, and Muhammad (2015) used Global Findex data for Nigeria and found that women, older people and low-income households were less likely to be financially included and that differences in secondary education and income explained much of the gender gap. Ghosh and Chaudhury (2019) applied a Fairlie decomposition to Indian Findex data and found that differences in employment explained a large

part of the gap in account ownership, savings and credit, while lower education limited women's use of digital services. Özşuca (2019) found the same role for employment in 14 MENA countries, and Kazemikhasragh, Cicchiello, Monferrá, and Girón (2022) confirmed with probit models that women in MENA were less likely than men to hold accounts or use mobile financial services. In Tanzania, Mndolwa and Alhassan (2020) found large gaps in savings accounts and mobile money, linked to women's lower education and income and their economic dependence on men. Ghosh and Vinod (2017) showed that education, income and social norms constrain women's financial inclusion in India.

These studies tell a consistent story. Women's exclusion from finance largely reflects their position in education and the labour market. That raises the question of whether finance can change their

Evidence on financial inclusion and gender outcomes

Household experiments suggest that finance can change outcomes. Ashraf et al. (2010) found that a commitment savings product raised women's decision-making power in the Philippines. Swamy (2014) found larger income gains for women than for men from financial inclusion programmes in India. In Nigeria, Ogunrinde (2024) found that women in self-help groups with better access to formal finance reported greater economic empowerment.

Cross-country studies are more mixed. Ohiomu and Ogbeide-Osaretin (2019) used GMM for 17 Sub-Saharan African countries over 2011-2017 and found that financial inclusion reduced gender inequality, with access mattering more than usage and female education playing a large role. Saha (2022) studied developing countries over 2005–2019 with fixed effects and found that financial inclusion reduced gender inequality, especially in low- and lower-middle-income countries, with diminishing returns at higher incomes. Maruta, Edjigu, and Kassa (2023) used principal component indices for 42 African countries and found that financial inclusion raised the female Human Development Index, with access having the strongest effect. Arshad (2023) used fixed effects, two-stage least squares and GMM for developing countries over 2004-2019 and found that financial inclusion strengthened women's empowerment. Yoon, Oh, and Park (2025) built an index of inclusion beyond what a country's income would predict and found, for 100 countries over 2014-2021, that such efforts reduced gender gaps in access and were followed by improvements in broader gender equality, especially in reproductive health.

Other studies point to limits. Ayodeji et al. (2025) found that more ATMs and branches were associated with lower female labour force participation in Sub-Saharan Africa and that the effect of inclusion diminished as it rose. Aterido et al. (2013) found no gender gap in the use of financial services in Sub-Saharan Africa once income, education and employment were controlled for, which suggests that the binding constraint may lie outside finance. Wani, Alharthi, Khanday, Subhan, and Al-Faryan (2024) approached the question from the other side and found, for 48 developing countries over 2004-2019, that financial inclusion and gender equality reinforce each other in raising growth.

Other determinants of gender inequality

The literature identifies several other drivers. High fertility interrupts women's schooling and reduces their labour supply (Bloom, Canning, Fink, & Finlay, 2009). Education, especially when made compulsory, keeps girls in school longer and delays marriage and childbearing; Osili and Long (2008) found that an additional year of schooling reduced early fertility in Nigeria. Klasen (2002) and Klasen and Lamanna (2009) showed that gender gaps in education and employment reduce growth, which implies that narrowing them has economic as well as social returns. Duflo (2012) reviewed the two-way link between development and women's empowerment and concluded that growth alone does not guarantee equality. Gaddis and Klasen (2014) found only weak support for a U-shaped link between development and women's labour force participation. Branisa, Klasen, and Ziegler (2013) showed that informal social institutions such as discriminatory family codes and son preference predict gender outcomes beyond formal institutions.

Two gaps remain. Most cross-country studies on finance and gender inequality use short panels or static estimators that ignore the slow movement of gender outcomes, and few report the long-run effect that a dynamic model implies. This paper addresses both.

Material and methods

Data and sample

The sample consists of 36 developing countries observed between 2000 and 2025 in an unbalanced panel (Appendix Table A1). Countries were included where data on financial inclusion and gender inequality were available for most of the period. More than half of them are in Sub-Saharan Africa, and the others are spread across Asia, Latin America and the Caribbean, the Middle East and North Africa, Europe and the Pacific. We pool the countries because separate income groups would be too small for dynamic panel estimation.

The Gender Inequality Index is taken from the United Nations Development Programme. The financial inclusion indicators come from the IMF Financial Access Survey (FAS). Fertility, compulsory schooling, unemployment and GDP per capita growth come from the World Development Indicators (WDI), and the six governance dimensions come from the Worldwide Governance Indicators (Kaufmann, Kraay, & Mastruzzi, 2011).

Variables

The dependent variable is the GII, introduced by UNDP in 2010 (United Nations Development Programme, 2010). It combines three dimensions. Reproductive health is measured by the maternal mortality ratio and the adolescent birth rate. Empowerment is measured by the shares of parliamentary seats held by women and men and by the shares of women and men with at least some secondary education. Labour market participation is measured by female and male labour force participation rates. The index runs from 0 to 1, and higher values mean greater inequality.

The main explanatory variable is a financial inclusion index (FII). It is the first principal component of six standardised FAS indicators: deposit accounts and loan accounts with commercial banks per 1,000 adults, commercial bank branches and ATMs per 100,000 adults, registered mobile money agent outlets per 100,000 adults, and outstanding commercial bank loans as a percentage of GDP:

$$FII_{it} = \Sigma_j \quad w_j Z_{ijt}\,, \; j = 1, \ldots, 6 \qquad (1)$$

where Z_{ijt} is the standardised indicator and w_j its loading on the first component. The index is rescaled to the 0–1 range. FAS indicators are not broken down by sex for most countries in the sample, so the index measures overall inclusion. The question is therefore whether wider access in an economy as a whole reduces gender inequality.

The controls follow the theory in Section 2. The total fertility rate (FERT, births per woman) captures the burden of childbearing. Duration of compulsory education (CSE, years) captures the legal commitment to keep children in school. The unemployment rate (UR) captures labour market conditions. GDP per capita growth (GDPPC) captures economic performance. Institutional quality (WGI) is the first principal component of the six Worldwide Governance Indicators: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. Table 1 summarises all variables.

Table 1. Definition of variables and data sources

Variable	Symbol	Measurement	Source
Gender inequality	GII	Gender Inequality Index (reproductive health, empowerment, labour market), 0–1	UNDP
Financial inclusion	FII	PCA index of six access and usage indicators, 0–1	Authors, from IMF FAS
Fertility	FERT	Total fertility rate, births per woman	WDI
Compulsory schooling	CSE	Duration of compulsory education, years	WDI
Unemployment	UR	Unemployment rate, % of labour force	WDI
Economic growth	GDPPC	Annual growth of GDP per capita, %	WDI
Institutional quality	WGI	PCA index of six Worldwide Governance Indicators	Authors, from WGI

Note: UNDP = United Nations Development Programme; FAS = Financial Access Survey; WDI = World Development Indicators; WGI = Worldwide Governance Indicators.

Model specification

Drawing on the capability approach (Sen, 1999), household bargaining theory (Sen, 1990), household economics (Becker, 1981) and new institutional economics (North, 1990), gender inequality is written as a function of financial inclusion and the controls:

$$GII = f(FII, FERT, CSE, UR, GDPPC, WGI) \quad (2)$$

Since the GII depends heavily on its own past, the empirical model is dynamic:

$$GII_{it} = \beta_0 + \delta\, GII_{i,t-1} + \beta_1\, FII_{it} + \beta_2\, FERT_{it} + \beta_3\, CSE_{it} + \beta_4\, UR_{it} + \beta_5\, GDPPC_{it} + \beta_6\, WGI_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

where μ_i is a country effect and ε_{it} an error term. We expect $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 < 0$, $\beta_5 < 0$ and $\beta_6 < 0$. The expected sign of unemployment is ambiguous. Unemployment may worsen women's position, but because the GII measures the gap between men and women, job losses concentrated among men or an added-worker response by women could lower measured inequality. The coefficient δ measures persistence. When $0 < \delta < 1$, the long-run effect of a permanent change in financial inclusion is:

$$\theta_FII = \beta_1 / (1 - \delta) \quad (4)$$

and the share of the long-run effect reached after k years is $1 - \delta^k$.

Estimation strategy

We test for cross-sectional dependence with the CD test of Pesaran (2004), which uses the average of pairwise correlations between countries:

$$CD = \sqrt{[2T / N(N-1)]}\, \Sigma_{i=1}^{N-1} \Sigma_{j=i+1}^{N} \hat{\rho}_{ij} \quad (5)$$

Where dependence is present, standard panel unit root tests are invalid, so we use the CIPS test of Pesaran (2007), which adds cross-sectional averages to each country's Dickey–Fuller regression:

$$\Delta y_{it} = a_i + b_i\, y_{i,t-1} + c_i\, \bar{y}_{t-1} + d_i\, \Delta \bar{y}_t + e_{it} \quad (6)$$

The lagged GII in equation (3) is correlated with μ_i, and financial inclusion may respond to women's economic position, so ordinary panel estimators are biased. We use the difference GMM estimator of Arellano and Bond (1991), which removes μ_i by first-differencing and instruments the differenced regressors with lagged levels:

$$E[GII_{i,t-s}\, \Delta\varepsilon_{it}] = 0, \; s \geq 2 \quad (7)$$

and the system GMM estimator of Blundell and Bond (1998), which adds the equation in levels with lagged differences as instruments. System GMM is preferred because the GII and the financial inclusion index are both close to unit root processes, which makes lagged levels weak instruments in difference GMM. We report one-step and two-step versions of both, with the Windmeijer (2005) correction for two-step standard errors. Instrument validity is assessed with the Hansen, Sargan and Difference-in-Hansen tests, and serial correlation with the Arellano-Bond AR(1) and AR(2) tests. We keep the number of instruments below the number of countries (Roodman, 2009).

Results and discussion

Descriptive statistics and correlations

Table 2 shows that the GII averages 0.516 and ranges from 0.107 to 0.840, so the sample includes countries close to parity and countries with very large gaps. The financial inclusion index averages 0.255, which is low on its 0–1 scale, and is strongly skewed to the right. Women in the sample have 3.7 children on average, with a maximum above 7, and compulsory schooling lasts 8.3 years on average, from 5 to 15. Unemployment averages 8.6 percent but ranges from 0.2 to 36.5 percent. The Jarque–Bera test rejects normality for every variable.

Table 2. Summary statistics

Variable	Mean	Std. dev.	Min	Max	Skewness	Kurtosis	Jarque–Bera
GII	0.516	0.116	0.107	0.840	-0.599	3.684	74.234***
FII	0.255	0.148	0.000	1.000	1.972	8.312	1707.205***
FERT	3.727	1.428	1.196	7.249	0.214	2.131	36.603***
CSE	8.337	2.328	5.000	15.000	0.564	3.066	48.444***
UR	8.558	7.003	0.249	36.472	1.289	4.373	332.761***
GDPPC	2.038	4.389	-36.825	33.769	-1.130	20.035	11516.632***
WGI	0.587	0.121	0.181	0.918	0.161	3.290	7.351*

Note: ***, ** and * denote rejection of normality at the 1%, 5% and 10% levels.

Table 3 reports the correlations. Financial inclusion is negatively correlated with the GII (-0.577). Fertility has the strongest correlation with the GII (0.631) and is also strongly negatively correlated with financial inclusion (-0.625). Compulsory schooling, growth and governance are negatively correlated with the GII, and unemployment is not significantly correlated with it. The highest correlation among the regressors is -0.625, between fertility and financial inclusion, which is below the usual threshold of 0.70–0.80, so multicollinearity is not a serious concern.

Table 3. Pearson correlation matrix

	GII	FII	FERT	CSE	UR	GDPPC	WGI
GII	1.000						
FII	-0.577***	1.000					
FERT	0.631***	-0.625***	1.000				
CSE	-0.161***	0.292***	-0.149***	1.000			
UR	-0.033	0.161***	-0.228***	-0.074**	1.000		
GDPPC	-0.177***	-0.020	-0.113***	-0.073**	-0.086***	1.000	
WGI	-0.372***	0.572***	-0.470***	0.187***	0.244***	0.033	1.000

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels.

Cross-sectional dependence and unit roots

The CD test in Table 4 rejects cross-sectional independence for all variables except governance (p = 0.168). Dependence is strongest for financial inclusion (average correlation 0.84), fertility (0.81) and the GII (0.50). Fertility decline, the spread of mobile money and gains in girls' schooling have moved together across developing countries, so this result is expected.

Table 4. Pesaran (2004) cross-sectional dependence test

Variable	CD statistic	p-value	Mean ρ	Mean |ρ|
GII	63.526	0.000	0.50	0.79
FII	107.100	0.000	0.84	0.84
FERT	103.240	0.000	0.81	0.88
CSE	6.313	0.000	0.05	0.05
UR	13.097	0.000	0.10	0.43
GDPPC	25.751	0.000	0.20	0.26
WGI	1.379	0.168	0.10	0.34

Note: The null hypothesis is cross-sectional independence.

Table 5 reports the CIPS test. GDP per capita growth is stationary in both specifications, and fertility is stationary without a trend. Unemployment is stationary with a trend at the 10 percent level, and governance is close to stationary without a trend. The GII, financial inclusion and compulsory schooling are non-stationary in levels. The mix of stationary and persistent series, and in particular the persistence of the dependent variable, supports a dynamic GMM approach.

Table 5. Pesaran (2007) CIPS panel unit root test

Variable	Lag (no trend)	Zt-bar (no trend)	p-value	Lag (trend)	Zt-bar (trend)	p-value
GII	0	2.178	0.985	0	4.481	1.000
FII	0	6.696	1.000	0	5.660	1.000
FERT	1	-4.166	0.000	0	4.300	1.000
CSE	0	17.702	1.000	0	16.954	1.000
UR	0	-0.139	0.445	0	-1.518	0.065
GDPPC	1	-7.263	0.000	1	-5.669	0.000
WGI	0	-1.505	0.066	1	-0.070	0.472

Note: The null hypothesis is that the series contains a unit root.

Financial inclusion and gender inequality

Table 6 reports the GMM estimates. The coefficient on the lagged GII is positive and significant at the 1 percent level in every column, from 0.492 in the one-step difference GMM to 0.726 in the two-step system GMM. About three-quarters of each year's gender inequality carries over to the next. As expected, difference GMM gives lower persistence than system GMM, because lagged levels are weak instruments for a persistent series (Blundell & Bond, 1998).

Table 6. Financial inclusion and gender inequality (dependent variable: GII)

Variables	One-step difference GMM	Two-step difference GMM	One-step system GMM	Two-step system GMM
L.GII	0.492***	0.505***	0.718***	0.726***
	(0.164)	(0.153)	(0.094)	(0.091)
FII	-0.281**	-0.302**	-0.338***	-0.352***
	(0.121)	(0.129)	(0.098)	(0.101)
FERT	0.029**	0.031**	0.017**	0.019**
	(0.013)	(0.014)	(0.008)	(0.009)
CSE	-0.018*	-0.021**	-0.026***	-0.028***
	(0.010)	(0.010)	(0.008)	(0.009)
UR	-0.001**	-0.001**	-0.002***	-0.002***
	(0.0005)	(0.0005)	(0.0007)	(0.0007)
GDPPC	-0.001**	-0.001**	-0.002***	-0.002***
	(0.0004)	(0.0004)	(0.0005)	(0.0005)
WGI	-0.094*	-0.112**	-0.146***	-0.153***
	(0.053)	(0.055)	(0.048)	(0.050)
Constant	0.082*	0.091**	0.167***	0.158***
	(0.046)	(0.044)	(0.039)	(0.041)
Hansen test (p-value)	0.381	0.416	0.534	0.487
Sargan test (p-value)	0.214	0.267	0.301	0.249
Difference-in-Hansen (p-value)	0.246	0.298	0.221	0.183
AR(1) (p-value)	0.024	0.018	0.012	0.027
AR(2) (p-value)	0.602	0.664	0.518	0.447
Number of instruments	30	30	31	31
Observations	900	900	900	900

Number of countries	36	36	36	36

Note: Standard errors in parentheses. p-values are reported for all diagnostic tests. ***, ** and * denote significance at the 1%, 5% and 10% levels. Two-step standard errors use the Windmeijer (2005) correction.

The financial inclusion index is negative and significant in all four columns, from -0.281 to -0.352. The effect is significant at the 5 percent level in the difference GMM models and at the 1 percent level in the system GMM models. In the two-step system GMM, a 0.1 rise in the index, about two-thirds of its standard deviation, lowers the GII by 0.035 points in the same year. Using equation (4), the long-run effect is -0.352 / (1 - 0.726) = -1.285, so a permanent 0.1 rise in the index would eventually lower the GII by about 0.128 points. This is slightly more than one standard deviation of the GII in the sample (0.116). Because δ is 0.726, about 80 percent of the long-run effect is reached after five years, and half of it after a little over two years. Panel (b) of Figure 1 traces this path.

The control variables mostly have the expected signs. Fertility is positive and significant in all columns (0.019 in the two-step system GMM), so each additional birth per woman raises the GII. Compulsory schooling is negative and significant (-0.028), so each additional year of required schooling lowers the GII. GDP per capita growth (-0.002) and governance (-0.153) also reduce gender inequality. Unemployment has a small negative coefficient (-0.002), which we discuss below.

To compare the size of these effects, panel (a) of Figure 1 shows standardised coefficients: the effect on the GII, in standard deviations, of a one standard deviation change in each variable. Compulsory schooling has the largest effect (-0.56), followed by financial inclusion (-0.45) and fertility (0.23). Governance (-0.16), unemployment (-0.12) and growth (-0.08) have smaller effects. Among the variables in the model, financial inclusion is the second most important determinant of gender inequality.

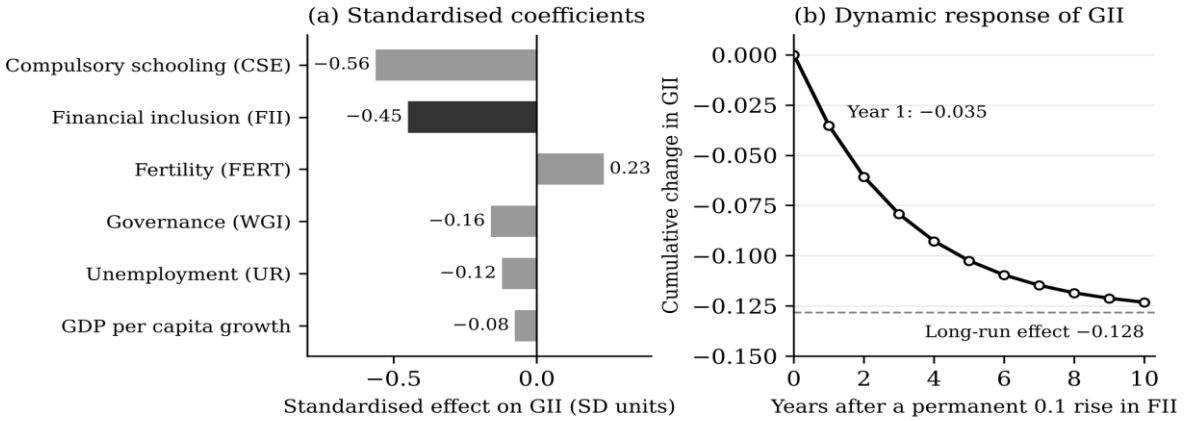


Figure 1. Relative size and dynamics of the effect of financial inclusion on gender inequality

Note: Panel (a) shows standardised coefficients, computed as the two-step system GMM coefficient in Table 6 multiplied by the standard deviation of the regressor and divided by the standard deviation of the GII (Table 2). Panel (b) shows the cumulative change in the GII after a permanent 0.1 rise in the financial inclusion index, computed as $\beta_1 \times 0.1 \times (1 - \delta^k) / (1 - \delta)$ with $\beta_1 = -0.352$ and $\delta = 0.726$.

The diagnostic tests support the estimates. The Hansen p-values range from 0.381 to 0.534 and the Sargan p-values from 0.214 to 0.301. The Difference-in-Hansen p-values (0.183 to 0.298) support the additional instruments in system GMM. AR(1) is significant, as differencing implies, and AR(2) is not (p-values 0.447 to 0.664). Each model uses 30 or 31 instruments for 36 countries.

Discussion

This section interprets each result and relates it to the literature, starting with the persistence of gender inequality and financial inclusion and then turning to the control variables.

Persistence of gender inequality

The lagged GII coefficient of 0.726 means that about three-quarters of each year's gender inequality carries over to the next. Three features of the index explain this. Maternal mortality and adolescent births depend on health systems and social norms that change over decades. Differences in secondary education between adult women and men reflect schooling decisions made many years earlier. And women's share of parliamentary seats and their participation in the labour market change mainly as new generations replace old ones. For policy, persistence means that most of the effect of any intervention arrives over several years, so short evaluations will understate what policies achieve. Because δ is 0.726, about 80 percent of the long-run effect of a permanent change is reached after five years. The long-run effect of -0.128 for a 0.1 rise in financial inclusion should be read as an upper bound, since it assumes that the rise is permanent and that the dynamic model holds over the whole adjustment path.

Financial inclusion

Financial inclusion lowers gender inequality through three channels. First, an account in a woman's own name gives her a safe and private place for her money, which raises her control over household resources and her bargaining power in family decisions. Ashraf et al. (2010) found that women in the Philippines who received individual commitment savings accounts gained decision-making power within the household. Second, access to credit lets women start or expand small businesses and become self-employed, which raises their earnings and their participation in economic life. This entrepreneurship channel matters most where formal wage jobs for women are scarce (Demirgüç-Kunt et al., 2017). Third, savings and credit help households pay school fees and health costs and smooth consumption after shocks, so girls are less likely to be taken out of school in bad years (Swamy, 2014). These channels act on the empowerment and labour market components of the GII and, through better access to health care, on reproductive health. Yoon et al. (2025) found that the strongest later gains from inclusion came in reproductive health.

The result is consistent with Swamy (2014), who reports larger income gains for women than for men from financial inclusion programmes in India, with Ohiomu and Ogbeide-Osaretin (2019) for Sub-Saharan Africa, Saha (2022) for developing countries, Maruta et al. (2023) for Africa and Arshad (2023), and with the review of Demirgüç-Kunt et al. (2017). It contrasts with Aterido et al. (2013), who found that the gender gap in the use of finance in Sub-Saharan Africa disappears once income, education and employment are controlled for, which suggests that in some settings the binding constraint is women's economic position rather than finance. It also contrasts with Ayodeji et al. (2025), who found a negative link between bank infrastructure and female labour force participation. Two features of our study may explain the difference. Our index includes mobile money agents, which reach women in rural areas and informal work more easily than branches do, and our outcome is a broad index rather than labour force participation alone. Finance may raise women's bargaining power and health outcomes even where it does not draw them into formal jobs.

Fertility

Fertility raises gender inequality (0.019 in the two-step system GMM), and three mechanisms explain this. First, early and frequent childbearing ends many girls' schooling, and the time needed to raise many children stops women from acquiring further skills (Klasen & Lamanna, 2009). Second, childbearing and childcare reduce women's labour force participation, push them into informal or part-time work and lower their lifetime earnings; Bloom et al. (2009) estimate that each additional child substantially reduces a woman's labour supply during her reproductive years. Third, higher fertility increases exposure to maternal mortality and adolescent births, which are direct components of the GII, so it worsens the reproductive health dimension of the index (Duflo, 2012). The result is consistent with Klasen and Lamanna (2009) and Bloom et al. (2009). In richer economies, where fertility is already low, variation in fertility shows a weaker link with gender gaps, which suggests that this channel matters mainly in developing countries such as those in our sample.

Compulsory schooling

Each additional year of compulsory schooling lowers the GII (-0.028), and compulsory schooling has the largest standardised effect in the model. Three reasons support this. First, compulsory schooling laws keep girls in school longer: when education is legally required, parents face pressure to enrol daughters as well as sons, which reduces early dropout and child marriage (Duflo, 2012). Second, education raises women's skills, productivity and wages, which narrows gender gaps in employment and income; Klasen (2002) shows that gender gaps in education reduce growth because they waste women's human capital. Third, educated women marry later, have fewer children and take more part in political and community life, which improves both the empowerment and health dimensions of the GII. Osili and Long (2008) found that one additional year of schooling reduced early fertility in Nigeria. The result is consistent with Klasen (2002) and Osili and Long (2008). It contrasts with Kingdon (1998), who found that in India the low labour market return to women's education held back female schooling, which shows that education alone does not ensure equality where discrimination persists. In our sample, however, longer compulsory schooling is clearly associated with lower gender inequality.

Unemployment

The coefficient on unemployment is negative and small (–0.002), which runs against the expected positive sign. The GII measures the gap between women and men, not the level of welfare, and three explanations account for the result. First, in many developing countries unemployment shocks fall on male-dominated sectors such as construction, mining and manufacturing, so a rise in total unemployment can reduce men's relative advantage in the labour market (Rubery & Rafferty, 2013). Second, there is an added-worker effect: when male household members lose jobs or income, women enter the labour force to make up the loss. Bhalotra and Umaña-Aponte (2010) document this pattern across a large sample of developing countries. Third, because the labour market component of the GII is based on the participation gap, any shock that raises female participation relative to male participation lowers measured inequality even if conditions worsen overall. The result is consistent with Bhalotra and Umaña-Aponte (2010). It contrasts with Seguino (2010), who argues that economic crises tend to hurt women's employment more because women hold more insecure and informal jobs. The standardised effect is only –0.12, so unemployment is not a major driver of gender inequality in either direction.

GDP per capita growth

Faster growth lowers gender inequality (–0.002), through three channels. First, growth expands job opportunities, and as labour demand rises, employers hire more women, which draws them into paid work and narrows the participation gap (Duflo, 2012). Second, higher incomes relax budget constraints: governments can spend more on schools, clinics and infrastructure, and households can afford to educate all their children rather than favouring sons (Klasen, 2002). Third, growth usually comes with a shift from agriculture to manufacturing and especially services, and services employ relatively more women (Gaddis & Klasen, 2014). The result is consistent with Klasen (2002) and Duflo (2012), who both stress that development and gender equality support each other. It contrasts with Seguino (2000), who found that in some export-oriented Asian economies growth relied on low female wages and so widened gender wage gaps. It also differs from Gaddis and Klasen (2014), who found that the link between development and women's labour force participation is weak and non-linear. Growth has the smallest standardised effect in our model (–0.08), which fits the conclusion of Duflo (2012) that growth alone does little for gender equality.

Institutional quality

Better governance lowers gender inequality (–0.153), through three mechanisms. First, the rule of law ensures that laws protecting women, on property, inheritance, domestic violence and workplace discrimination, are enforced rather than remaining on paper; the World Bank (2012) identifies the gap between formal law and its enforcement as a main source of persistent gender inequality. Second, effective government improves the delivery of schools, clinics, water and electricity, and women benefit most from these services because they bear most of the burden of household work and care (Sen, 1999). Third, voice and accountability open political space for women: where citizens can take part and make demands, women's political representation rises, and female policy makers tend to

advance policies that benefit women (Duflo, 2012). The result is consistent with the World Bank (2012). It contrasts with Branisa et al. (2013), who argue that formal institutions matter less where discriminatory family codes and son preference dominate, which implies that governance reform alone may not be enough in strongly traditional societies. This may explain why the governance effect in our model is modest (standardised effect ~0.16).

Conclusion and policy implications

This study examined whether financial inclusion reduces gender inequality in 36 developing countries over 2000–2025. Using dynamic panel GMM to deal with the persistence of gender inequality and the possible two-way link between finance and women's position, we find that financial inclusion lowers the Gender Inequality Index in all four estimators. A 0.1 rise in the inclusion index lowers the GII by 0.035 points in the first year and by about 0.128 points in the long run. In standardised terms, financial inclusion is the second most important determinant of gender inequality in the model, after the length of compulsory schooling. Higher fertility raises gender inequality, while compulsory schooling, growth and governance reduce it.

The findings suggest several policies. First, financial inclusion should be part of national gender strategies, with targets for women's account ownership and borrowing and with sex-disaggregated data collection, which most FAS indicators currently lack. Second, the design of access matters. Mobile money agents, simplified identity requirements and accounts that women can open and operate without a male relative's consent are more likely to reach women than new branches alone. Third, because the effect builds up over several years, programmes need sustained funding and should be judged over a long horizon. Fourth, financial inclusion works alongside education and demographic change, so longer compulsory schooling, family planning and maternal health services should go together with access to finance. Fifth, legal reforms on women's property and inheritance rights, and their enforcement, allow women to use credit and savings to build assets in their own names.

The study has limitations. The inclusion index measures overall access, not women's access, because sex-disaggregated FAS data are not available for most countries and years. The GII has been criticised for combining dimensions measured only for women, such as maternal mortality, with dimensions measured for both sexes (Permanyer, 2013). The sample is selected on data availability, and pooling may hide differences between income groups. GMM uses internal instruments, which cannot fully rule out reverse causality. Future research could use sex-disaggregated Findex data as they accumulate, estimate the effect on each component of the GII separately, test whether the effect depends on legal rights and social norms, and examine income groups separately.

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Appendix

Table A1. Countries in the sample

No.	Country	No.	Country	No.	Country
1	Albania	13	Gambia, The	25	Myanmar
2	Bangladesh	14	Guinea	26	Nepal
3	Botswana	15	Haiti	27	Pakistan
4	Cameroon	16	Honduras	28	Rwanda
5	Central African Republic	17	Jordan	29	Samoa
6	Chad	18	Kenya	30	South Africa
7	Colombia	19	Lesotho	31	Tanzania
8	Congo, Rep.	20	Madagascar	32	Thailand
9	Egypt, Arab Rep.	21	Malawi	33	Togo

10	El Salvador	22	Maldives	34	Tonga
11	Eswatini	23	Mauritania	35	Uganda
12	Fiji	24	Mauritius	36	Zambia