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Joseph Keneck-Massil
Alphonse Noah

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STATE FRAGILITY, INCLUSIVE GROWTH, AND FINANCIAL INCLUSION: NEW EVIDENCE FROM AFRICAN COUNTRIES.

By

Joseph Keneck-Massil
FSEG-CEREG
University of Yaoundé II, Cameroon

Alphonse Noah
LAPE
University of Limoges, France

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Abstract

Fragile states account for a disproportionate share of global poverty and are projected to host 60 per cent of the world's poor by 2030, yet the mechanisms by which policy interventions can mitigate fragility's developmental costs remain poorly understood. This paper investigates whether financial inclusion moderates the adverse effects of state fragility on inclusive growth in Africa. Drawing on panel data for 40 African economies over 2006–2024 and employing the two-step system GMM estimator, we find that state fragility significantly depresses inclusive growth, while financial inclusion exerts a nearly offsetting positive effect in the long run. Critically, financial inclusion moderates fragility's adverse impact: beyond a threshold of 0.36 on the normalised financial inclusion index, fragility's growth-suppressing effect is fully neutralised. Decomposing financial inclusion into penetration, availability, and usage reveals that active engagement with financial services drives this moderation more powerfully than mere account ownership or infrastructure presence. These findings are robust to alternative measures of inclusive growth and income-level heterogeneity. The results suggest that expanding financial inclusion, particularly through digital finance and usage-oriented interventions, constitutes a powerful instrument for mitigating the developmental costs of fragility in Africa.

JEL Classification: D74; G20; O11, O43; O55

Keywords: Financial inclusion, state fragility, inclusive growth, Africa

1. Introduction

This paper examines whether financial inclusion can attenuate the adverse effects of state fragility on inclusive growth in Africa. State fragility refers to a situation in which a government is unable to perform one or more of the three core functions of the state: controlling violence, providing essential public services, and maintaining the consent of the governed. While fragile states differ in their historical trajectories and institutional configurations, they share a set of structural weaknesses that impede sustained development. Weak and less inclusive institutions, poor governance, limited state legitimacy, and persistent political instability, including episodes of civil conflict, continue to constrain development outcomes across these economies. As a consequence, fragile states tend to be particularly vulnerable to economic instability, reflecting shortcomings in economic management and a limited capacity to absorb external and domestic shocks (Gelbard et al., 2015). Empirical evidence further indicates that the most fragile economies experience higher macroeconomic volatility, more frequent crises, and systematically lower growth rates (Chuku and Onye, 2019; Miksjuk et al., 2026).

Relative to other world regions, Africa exhibits the highest regional concentration of fragile states, a pattern that has shown marked persistence over time. Cross-regional comparisons indicate that West, Central, and Southern Africa remain the most fragile subregions, driven by civil violence, armed conflict, poverty, debt burdens, and pronounced income inequality (Nkoa and Song, 2021). In contrast, East and North Africa have recorded comparatively lower levels of fragility. According to the Fund for Peace's 2024 Fragile States Index, 20 of the 30 most fragile countries globally are located in Africa, with Somalia, Sudan, South Sudan, and the Democratic Republic of the Congo ranking among the most fragile. This entrenched fragility is further reflected in the recent wave of coups d'état in Gabon, Niger, Sudan, Chad, Burkina Faso, Mali, and Guinea. More than half of the continent's population currently lives in states affected by fragility and conflict-related disruptions (Chen et al., 2025).

The macroeconomic consequences of this entrenched fragility are both severe and self-reinforcing. Several of Africa's most fragile countries appear trapped in a low-growth, poor-governance equilibrium that perpetuates and exacerbates the underlying drivers of fragility itself (Andrimihaja et al., 2011). These countries are characterised by such profound policy and institutional weaknesses that the state is unable to effectively contain violent or extremist groups, ensure the security of its citizens, or deliver basic public goods and services. Furthermore, Africa's high regional concentration of fragility implies that instability in one

country can readily spill over into neighbouring states, via forced migration, refugee flows, or cross-border insecurity, as currently observed across parts of the Sahel and the Horn of Africa. The costs of these dynamics are starkly visible in living standards: fragile states exhibit markedly lower GDP per capita, reduced access to basic public services including sanitation, clean water, and electricity, and elevated mortality rates relative to their non-fragile peers. Macroeconomic performance is similarly impaired: between 2006 and 2024, fragile states recorded an average annual real GDP growth rate 0.6 percentage points lower than that of non-fragile states, while experiencing inflation rates that were, on average, 3.6 percentage points higher. As Miksjuk et al. (2026) document, in Sub-Saharan Africa specifically, the median fragile and conflict-affected state is projected to achieve potential GDP per capita growth of just 1.8 per cent per year, compared with 2.5 per cent in the rest of the region, a gap that, left unaddressed, will only deepen the continent's development divide.

It is through these macroeconomic and institutional failures that state fragility directly impinges on inclusive growth. Inclusive growth is broadly understood as economic expansion accompanied by greater equity, ensuring that the benefits of growth reach all segments of society (Klasen, 2010). In several African countries, the persistence of conflict and institutional fragility undermines this process by limiting the ability of the poor and marginalised to escape poverty, thereby entrenching existing inequalities. State fragility traps large segments of the population in extreme poverty, which in turn can exacerbate conflict dynamics: poverty reduces the opportunity cost of engaging in violence or joining insurgent movements, thereby reinforcing a vicious cycle of fragility and exclusion (Collier and Hoeffler, 2004). According to the World Bank, 60 per cent of the world's poor (or 365 million people) are projected to live in fragile and conflict-affected states by 2030 (World Bank, 2025). In this context, fragility emerges as a critical barrier to inclusive growth and a major impediment to achieving the Sustainable Development Goals (SDGs), making the identification of policy levers to moderate its adverse effects both urgent and consequential.

One such lever is financial inclusion. Over the past two decades, Africa's financial landscape has undergone a profound transformation, marked by a steady increase in the number of local and Pan-African banking institutions (Brei et al., 2020). According to the IMF Financial Access Survey, the number of commercial bank branches rose from 4.3 per 100,000 adults in 2004 to 7.8 in 2024. While this expansion has gradually improved financial access across the continent, it is the rapid adoption of mobile money technologies that has most fundamentally transformed the frontier of financial inclusion. In many African economies, mobile money has become the

dominant financial tool, particularly in underserved areas with limited traditional banking infrastructure. According to the Global Findex Database, nearly one in two adults in Sub-Saharan Africa now holds a mobile money account, demonstrating the potential of digital finance to bridge structural gaps in financial access that conventional banking has failed to close. Financial inclusion provides wide-ranging benefits, encompassing poverty reduction, economic growth, entrepreneurship, gender equality, and reduced economic inequality (Suri and Jack, 2016; Adedokun and Ağa, 2021; Koloma, 2021; Nan et al., 2021; Elouaourti and Ibourk, 2024). For instance, evidence from Kenya shows that access to mobile money services such as M-Pesa lifted approximately 2 per cent of households out of extreme poverty. Crucially, however, financial inclusion is understood here not merely as financial deepening - that is, an increase in financial aggregates such as credit-to-GDP ratios - but as the effective access to and active use of affordable and appropriate financial services by households and firms (Ojah and Kodongo, 2024).

Against this backdrop, this paper investigates whether financial inclusion moderates the adverse effects of state fragility on inclusive growth in Africa. This question remains both highly policy-relevant and strikingly underexplored. In fragile settings, financial inclusion can moderate these adverse effects through five complementary potential channels. First, by providing access to savings, remittances, and payment systems, it strengthens household resilience against the macroeconomic shocks that fragile states are ill-equipped to absorb. Second, by expanding access to credit, it supports micro- and small-scale entrepreneurship in economies where formal employment opportunities are severely constrained. Third, by enabling households to privately finance education and health expenditures, it partially substitutes for the public service delivery failures that both drive and perpetuate fragility. Fourth, digital finance and mobile money platforms extend these benefits to populations in areas where physical banking infrastructure is absent or destroyed. Fifth, by granting women autonomous control over financial resources, financial inclusion shifts intra-household resource allocation in ways that generate intergenerational human capital spillovers independently of institutional quality. Taken together, these channels suggest that financial inclusion does not merely promote inclusive growth directly - it fundamentally alters the terms on which state fragility transmits into economic outcomes. This moderating role constitutes the central hypothesis guiding our empirical investigation.

Drawing on a panel data set covering 40 African countries over the period 2006-2024, our empirical analysis establishes three key insights. First, financial inclusion is positively

associated with inclusive growth, confirming that wider access to financial services fosters more equitable economic progress. Second, state fragility significantly hinders inclusive growth. Third, and most importantly, financial inclusion attenuates this adverse effect, highlighting its role in enhancing economic resilience in fragile environments. These results corroborate and substantially extend the work of Fowowe and Folarin (2019), who used cross-sectional evidence from 34 African countries to document the negative impact of fragility and the positive impact of financial inclusion on inclusive growth. Our study builds on their work in three key respects: it employs dynamic panel techniques, specifically the two-step system GMM estimator, that account for persistence, endogeneity, and unobserved country heterogeneity; it adopts a multidimensional measure of financial inclusion that captures penetration, availability, and usage; and it introduces an interaction term between state fragility and financial inclusion to explicitly identify and quantify the mechanism by which financial inclusion buffers the adverse growth effects of fragility. Taken together, these contributions yield more precise and actionable policy insights for African economies operating under conditions of fragility.

The remainder of the paper proceeds as follows. Section 2 provides a review of the relevant literature. Section 3 describes the empirical methodology and data. Section 4 reports and discusses the empirical results. Section 5 concludes with policy implications.

2. Research Framework

2.1 Determinants of inclusive growth

Understanding the determinants of inclusive growth remains an active and evolving area of inquiry. Despite widespread consensus on the fundamental policies for promoting growth and poverty reduction, the factors that facilitate inclusive growth are not yet fully understood, a complexity that stems, in part, from the absence of a universally accepted definition and a single agreed-upon measure of the concept (Anand et al., 2013). Building on the framework proposed by Aoyagi and Ganelli (2015), the literature broadly identifies structural, monetary, fiscal, institutional, and financial factors as the principal determinants of inclusive growth.

Among structural and macroeconomic factors, Zhuang et al. (2014) document that the main drivers of rapid growth - technological progress, globalisation, and labour market reforms - contribute to inclusive growth when accompanied by effective distributive policies. Aoyagi and Ganelli (2015), drawing on a sample of Asian economies, further show that

distributive fiscal policies and macroeconomic stability through appropriate monetary policy are effective instruments for inclusive growth, alongside structural reforms that promote trade openness, reduce unemployment, and increase productivity. More recently, Alekhina and Ganelli (2021) confirm and extend these findings, demonstrating that fiscal redistribution, female labour force participation, productivity growth, foreign direct investment (FDI) inflows, digitalisation, and savings all significantly stimulate inclusive growth.

Institutional quality and human capital constitute a second cluster of determinants with well-documented effects. Jalles and de Mello (2019) show that enhancing human capital is associated with a higher likelihood of achieving inclusive growth, and that countries with stable political systems and proportional representation electoral systems are more likely to sustain it. Examining governance more specifically, Doumbia (2019) finds that although all governance dimensions are pro-poor, only government effectiveness and the rule of law are robustly conducive to inclusive growth. This result is reinforced by Oyinlola et al. (2020), who find a direct positive effect of all governance dimensions on inclusive growth. However, these dimensions do not significantly amplify the extent to which domestic resource mobilisation translates into inclusive outcomes.

Beyond macroeconomic and institutional factors, a growing body of evidence identifies financial development, financial inclusion, FDI, and information and communication technologies (ICT) as increasingly important drivers of inclusive growth, particularly in the African context. Oyinlola and Adedeji (2019) highlight that financial development amplifies the potential of human capital in driving inclusive growth, while Abor et al. (2018) demonstrate that mobile telephony and financial inclusion significantly reduce poverty and promote inclusive development. Amponsah et al. (2021) further reveal an inverted U-shaped relationship between financial inclusion and inclusive growth in Sub-Saharan Africa, suggesting that the benefits of financial inclusion exhibit diminishing returns beyond a threshold. On the role of ICT, Ofori et al. (2022) show that ICT diffusion directly and indirectly affects inclusive growth in Sub-Saharan Africa, with ICT skills, access, and use playing a crucial role, particularly when coupled with financial development. Complementing these findings, Kang and Martinez-Vazquez (2021) find that FDI exerts a positive effect on inclusive growth, especially in the presence of a large manufacturing or service sector, while Ofori and Asongu (2021) confirm that both FDI and ICT diffusion contribute to inclusive growth in Sub-Saharan Africa, with particular emphasis on the role of ICT skills. Finally, Ajide et al. (2021) highlight the positive impact of economic globalisation and entrepreneurship on inclusive growth in the region.

2.2 Effects of State Fragility

A substantial body of literature has investigated the macroeconomic consequences of state fragility, consistently documenting its adverse effects on growth, poverty, and inequality. Fragile states are generally characterised by lower economic growth, higher poverty rates, and persistent inequality relative to their non-fragile peers - outcomes that reflect a self-reinforcing cycle of poor macroeconomic performance, inadequate governance, insecurity, political violence, and corruption (Fowowe and Folarin, 2019; Miksjuk et al., 2026). Quantifying these costs, Chauvet et al. (2007) find that a failing state experiences an annual peacetime growth decline of 2.6 percentage points, with active violence imposing an additional 1.6 percentage points per year. Strikingly, they estimate that approximately 80 per cent of the total cost of state failure is borne by neighbouring countries, underscoring the significant negative externalities that fragility imposes beyond national borders, a finding particularly relevant for Africa, where fragility clusters are geographically concentrated. Complementing these findings, Ferreira (2018) examines the specific channels through which fragility undermines growth, providing robust evidence that state ineffectiveness, reflected in the inability to enforce contracts, protect property rights, provide public goods, and mobilise tax revenue, is a primary growth-suppressing mechanism, even when the effects of political violence are less precisely estimated.

Extending this evidence to the African context, Chuku and Onye (2019) find that fragile states experience greater macroeconomic volatility and more frequent crises, leading to lower growth systematically. Importantly, their results indicate that the security and social dimensions of fragility exert the most substantial causal influence on macroeconomic outcomes. At the same time, the political component has a comparatively weak effect. Beyond growth, the consequences of fragility extend to a broader range of macroeconomic and structural outcomes. Using a sample of MENA countries, Triki et al. (2022) find that state fragility significantly reduces inward FDI, though democratic governance and, somewhat unexpectedly, the presence of natural resources partially alleviate this adverse effect. Other studies further document fragility's damaging effects on human capital accumulation (Seyoum, 2020), population health (Diaconu et al., 2020), entrepreneurship (Idrees and Sarwar, 2021), and terrorism (Okafor and Piesse, 2018), collectively painting a picture of fragility as a multidimensional constraint on socioeconomic development.

Despite this rich evidence base on the macroeconomic costs of fragility, studies directly investigating the relationship between state fragility and inclusive growth remain strikingly sparse. To the best of our knowledge, Fowowe and Folarin (2019) provide the only systematic

examination of this nexus. Their cross-sectional analysis of African countries reveals a significant negative relationship between state fragility and inclusive growth. It demonstrates that financial inclusion exerts a positive, direct effect on inclusive growth. They further show that a less fragile environment promotes inclusive growth both directly and indirectly through financial inclusion. While this contribution is foundational, it leaves several important questions unanswered, notably regarding the dynamic nature of the fragility-inclusive growth relationship, the potential moderating role of financial inclusion, and the specific dimensions of financial inclusion through which this moderation operates. Our paper aims to address these gaps directly, building on and extending Fowowe and Folarin (2019) using dynamic panel methods, a multidimensional measure of financial inclusion, and an explicit interaction framework to identify and quantify the conditional relationships among fragility, financial inclusion, and inclusive growth.

2.3 How does financial inclusion mitigate the effect of state fragility on inclusive growth?

The emerging literature highlights the importance of financial inclusion in promoting inclusive growth through several well-documented economic mechanisms. Higher levels of financial inclusion enable poor and marginalised groups to engage in income-generating activities (Demirgüç-Kunt et al., 2017; Asuming et al., 2019), promote sustainable growth (Barajas et al., 2020), upgrade human capital (Arora, 2012), and alleviate poverty (Li, 2018). Corrado and Corrado (2017) argue that inclusive finance plays a central role in stimulating equitable growth by facilitating savings and productive investment, while Omar and Inaba (2020) provide robust cross-country evidence that financial inclusion significantly reduces poverty and income inequality. By providing individuals with tools to manage risk, accumulate assets, and finance productive activities, financial inclusion empowers households to improve their livelihoods and expand economic opportunities (Klapper et al., 2016; Polloni-Silva et al., 2021). While these effects are well documented in stable institutional environments, their relevance becomes considerably more critical in fragile settings, where the state is unable to perform its core functions and conventional growth transmission mechanisms are systematically disrupted. From a theoretical standpoint, financial inclusion may attenuate the adverse effects of state fragility on inclusive growth through five complementary potential channels.

The first is the resilience and risk-sharing channel. Fragile states are characterised by conflict, macroeconomic volatility, and chronically weak social protection systems (Chuku and Onye, 2019; Miksjuk et al., 2026). Access to savings accounts, remittances, and payment systems

enables households to smooth consumption and cope with adverse shocks, preventing temporary disruptions from crystallising into persistent poverty traps and thereby preserving the inclusiveness of growth.

The second is the entrepreneurship and credit channel. State fragility weakens institutional enforcement, discourages formal investment, and severely constrains job creation, trapping countries in a low-growth equilibrium that stifles private sector development (Miksjuk et al., 2026). In this environment, access to credit becomes a critical mechanism enabling micro- and small-scale entrepreneurship. As demonstrated by Burgess and Pande (2005) and Swamy (2014), expanding access to formal financial services raises household income and reduces poverty by facilitating productive investment. In fragile states where formal employment opportunities are severely limited, financial inclusion supports decentralised private economic activity, broadening the productive base and creating the private sector-led growth conditions essential to escaping the fragility trap over the long term.

The third is the human capital accumulation channel. Financial inclusion facilitates household investment in education, health, and insurance products, all of which are foundational to long-run inclusive growth (Arora, 2012; Dupas and Robinson, 2013; Ahmed and Cowan, 2021; Polloni-Silva et al., 2021). Since institutional fragility systematically undermines public service delivery (Miksjuk et al., 2026), access to financial resources enables households to privately finance human capital development, partially substituting for the public service failures that are both a driver and a manifestation of fragility. This substitution effect is particularly significant in Sub-Saharan Africa, where fragility-induced public expenditure compression disproportionately affects spending on education and health in lagging regions.

The fourth is the digital substitution channel. In many African fragile states, physical banking infrastructure is limited, damaged, or geographically concentrated in urban centres. Digital finance, and mobile money in particular, has emerged as a viable alternative for delivering financial services to underserved populations. Suri and Jack (2016) show that mobile money adoption in Kenya significantly reduced extreme poverty by enabling savings and facilitating remittances. By lowering transaction costs and extending financial access to rural populations, women, and youth, mobile money technologies partially substitute for the impaired resource allocation mechanisms associated with fragility, sustaining economic participation even under conditions of weak governance.

The fifth is the women's economic empowerment channel. Gender-based financial exclusion is particularly acute in fragile states, where patriarchal norms, conflict-related displacement, and institutional breakdown compound pre-existing barriers to women's economic participation. Financial inclusion shifts intra-household bargaining power by granting women autonomous control over resources, which evidence consistently shows improves expenditure allocation toward children's nutrition, health, and education (Duflo, 2012). Since socioeconomic exclusion, including unequal access to economic resources and public services, is itself a structural driver of fragility (Miksjuk et al., 2026), women's empowerment through financial access creates a bottom-up pathway to inclusive growth that operates independently of institutional quality, while simultaneously reinforcing the human capital and entrepreneurship channels identified above.

Taken together, these five potential channels suggest that financial inclusion does not merely promote inclusive growth directly; it fundamentally alters the terms on which state fragility transmits into economic outcomes. Consequently, we hypothesise that higher levels of financial inclusion attenuate the negative effect of state fragility on inclusive growth, a conditional relationship captured by the interaction term between state fragility and financial inclusion, introduced in our empirical specification.

3. Empirical Approach

3.1 Baseline model specification

To test whether financial inclusion attenuates the adverse effect of state fragility on inclusive growth, we estimate the following dynamic panel model, adapted from the specifications of Ali and Son (2007), Adedeji et al. (2013), Fowowe and Folarin (2019), and Amponsah et al. (2021):

$$IGI_{i,t} = \alpha IGI_{i,t-1} + \beta_1 FSI_{i,t} + \beta_2 FII_{i,t} + \beta_3 (FSI * FII)_{i,t} + \theta Z_{i,t} + \varphi_i + \gamma_t + \varepsilon_{i,t} \quad \textbf{(Eq. 1)}$$

Where $IGI_{i,t}$ is the inclusive growth index of country i in year t. FSI and FII denote the state fragility index and the financial inclusion indicator, respectively. The vector Z includes a set of control variables, such as domestic investment, trade openness, foreign direct investment (FDI), inflation, and the population growth rate, selected based on the inclusive growth literature reviewed in Section 2.1. φ_i, γ_t, and $\varepsilon_{i,t}$ capture country fixed effects, time fixed effects, and the idiosyncratic disturbance, respectively.

The interaction term $FSI * FII$ is the key variable of interest. Consistent with the potential channels developed in Section 2.3, a positive and statistically significant coefficient β_3 would indicate that financial inclusion significantly attenuates the negative effect of state fragility on inclusive growth - that is, as financial inclusion deepens, the growth-suppressing impact of fragility progressively diminishes. A negative and significant β_1, combined with a positive and significant β_3 would jointly confirm the central hypothesis of this paper.

Estimation of Eq. (1) relies on the two-step system GMM estimator of Blundell and Bond (1998), which simultaneously addresses the inconsistency arising from the correlation between the lagged dependent variable and country fixed effects, controls for the potential endogeneity of key regressors (notably financial inclusion and state fragility), and accounts for persistence in inclusive growth dynamics. To guard against instrument proliferation, which can severely weaken the Hansen test and bias coefficient estimates (Roodman, 2009), we ensure that, across all specifications, the number of instruments remains strictly below the number of countries in the sample. The validity of the instrument set is assessed via the Hansen test, while the Arellano-Bond AR(1) and AR(2) tests verify the absence of second-order serial correlation in the first-differenced residuals. All specifications report Windmeijer's (2005) finite-sample corrected standard errors.

3.2 Data

The empirical analysis draws on an unbalanced panel of 40 African countries over the period 2006–2024, with the full list provided in Appendix Table A1. The sample composition and study period are jointly determined by data availability for the two core variables of interest. Financial inclusion data are sourced from the IMF Financial Access Survey (FAS) database, while state fragility data are drawn from the Fund for Peace's Fragile States Index (FSI).

3.2.1 Measuring inclusive growth

Inclusive growth is a multidimensional concept whose measurement requires an index that captures the pace of economic expansion, its distributional quality, and the inclusiveness of economic participation. Although the inclusive growth framework proposed by the Asian Development Bank (ADB, 2012) has been widely applied in emerging Asian economies, it has increasingly been adapted to other developing regions. In the African context, studies such as Fowowe and Folarin (2019), Doumbia (2019), Oyinlola et al. (2020), and Ofori et al. (2022) emphasise that inclusive growth measurement must incorporate governance quality, poverty

reduction, employment creation, and infrastructure access, particularly in environments characterised by institutional fragility. Following Jombo (2021), who adapts the ADB approach to Sub-Saharan Africa by highlighting the importance of structural transformation, inequality reduction, and institutional effectiveness, our index adopts the ADB multidimensional structure while explicitly incorporating variables that reflect the structural and institutional realities of African fragile economies.

The index is constructed using a weighted aggregation procedure

Let $U = \{u_1,\ u_2, \ldots\ u_n\}$ denote the set of evaluation dimensions, $W = \{w_1,\ w_2, \ldots\ w_i\}$ the corresponding weight vector reflecting the relative importance of each indicator, and U_R the matrix of standardised single-indicator scores obtained following univariate standardisation of the raw indicators. The inclusive growth index (IGI) is then computed as:

$$IGI = \sum_{i=1}^{m}\left(\sum_{j=1}^{n} U_R * w_j\right) * W_i \qquad \textbf{(Eq. 2)}$$

where, U_R denotes the standardised single-indicator score, w_j is the weight of a single indicator within a dimension, and W_i is the dimensional layer weight. The index is based on four pillars, summarised along with their relative weights in Table 1.

The first pillar captures the expansionary dimension of inclusiveness through economic growth, employment, and infrastructure. Real GDP growth reflects an economy's capacity to generate sustained income increases, a necessary but insufficient condition for inclusive outcomes (Anand et al., 2013). Employment indicators are incorporated because labour market participation determines whether economic expansion translates into broad-based income opportunities - a dimension particularly relevant in fragile African economies where informality is pervasive, and job creation constitutes a key channel for inclusive participation. Infrastructure access, proxied by electricity access, captures the productive foundations of inclusion, as basic service access reduces spatial disparities and supports local productive capacity, especially in rural or conflict-affected areas (Aoyagi and Ganelli, 2015).

The second pillar addresses the distributive dimension of growth through indicators on poverty, inequality, and equity. Poverty headcount ratios measure the extent of absolute deprivation whose reduction lies at the core of inclusive growth objectives, particularly pertinent in fragile states where poverty traps are often persistent (Chauvet et al., 2007). Income inequality, measured by the Gini coefficient from the World Income Inequality Database (WIID), captures

the equity dimension, since inclusive growth requires not only aggregate income expansion but also a fair distribution of gains (Omar and Inaba, 2020). In fragile contexts, high inequality may exacerbate social tensions and undermine political stability, thereby reinforcing the fragility trap.

The third pillar emphasises accessibility and equality of opportunity through education and health indicators. School enrolment rates and life expectancy reflect individuals' capacity to accumulate human capital - a central determinant of long-run inclusive growth (Jalles and de Mello, 2019). In fragile African states, where public service provision is frequently disrupted, ensuring access to education and health services is essential to prevent exclusion and the intergenerational transmission of poverty.

The fourth pillar captures institutional inclusiveness through governance indicators. The corruption perception index, drawn from the Worldwide Governance Indicators (WGI), is incorporated because inclusive growth depends critically on the state's ability to deliver public goods equitably and free from rent-seeking behaviour (Doumbia, 2019). Corruption is particularly corrosive in fragile settings, where it diverts public resources away from service delivery, undermines the redistributive capacity of the state, and erodes citizens' trust in public institutions, thereby limiting the translation of economic growth into inclusive outcomes. By combining these four pillars, the index reflects not only economic expansion but also the distributive, opportunity-enhancing, and institutional dimensions that are particularly critical in African economies. Table 1 provides a comprehensive overview of each pillar, its constituent indicators, the corresponding weighting scheme, and summary statistics separately for fragile and non-fragile countries.

3.2.2 Explanatory variables

The two main explanatory variables in this paper are state fragility and financial inclusion, both of which are central to the paper's objective of examining the extent to which financial inclusion moderates the adverse impact of state fragility on inclusive growth in Africa.

State Fragility

State fragility is measured using the Fragile States Index (FSI) developed by the Fund for Peace (FFP). While alternative measures exist, including the World Bank's Country Policy and Institutional Assessment (CPIA), the FSI is preferred for two reasons. First, it encompasses a

broader range of factors capturing the multidimensional nature of fragility, covering social, economic, and political-military dimensions simultaneously (United Nations Economic Commission for Africa, 2012). Second, its annual frequency and wide country coverage make it particularly well-suited to dynamic panel estimation.

The FSI is structured around three main indicator groups, further disaggregated into 12 sub-indicators. The social indicators capture (i) demographic pressures, (ii) group grievances, (iii) refugees and internally displaced persons, and (iv) human and brain drain. The economic indicators cover (v) uneven economic development and (vi) poverty and economic decline. The political and military indicators encompass (vii) state legitimacy, (viii) public services, (ix) human rights and the rule of law, (x) the security apparatus, (xi) factionalised elites, and (xii) external intervention (Fund for Peace, 2016a, 2016b). Each sub-indicator is scored on a scale of 0 to 10, yielding a composite FSI score ranging from 0 to 120, where higher scores indicate greater fragility and lower scores greater stability. This multidimensional structure aligns closely with the conceptualisation of state fragility adopted in this paper, which emphasises the interplay of institutional weakness, social tension, and economic vulnerability as the defining features of fragile states.

Given that inclusive growth constitutes the dependent variable in our empirical framework, we follow McKay and Thorbecke (2019) and construct a fragility measure that excludes the development-related components of the FSI. Specifically, we aggregate the remaining nine sub-indicators, omitting those that directly capture economic underdevelopment, namely uneven economic development, poverty and economic decline. This approach is motivated by the reciprocal relationship between fragility and development: underdevelopment fosters fragility, while fragility hinders development (McKay and Thorbecke, 2019). Retaining these components would risk conflating the determinants of fragility with the outcome of interest, thereby introducing mechanical endogeneity into the empirical specification. Excluding them provides a cleaner identification of fragility's institutional and security dimensions and mitigates concerns about reverse causality.

Table 1. Components and summary statistics of the inclusive growth index in fragile and non-fragile African countries

Dimension Index		Area Index		Indicators		Non-fragile	Fragile	Source
Indicators	**Weight**	**Indicators**	**Weight**	**Indicators**	**Weight**			
Economic growth, employment, and infrastructure	0.45	Economy growth	0.2	GDP per capita growth	0.2	1.64	1.63	WDI
		Employment	0.15	Employment in the industrial sector	0.10	17.53	10.75	
				Employment in the services sector	0.05	44.64	30.39	
		infrastructure	0.1	Access to electricity	0.1	58.71	31.60	
Poverty, inequality, and equity	0.25	Income inequality	0.1	Gini index	0.2	41.79	40.01	WIID
		Poverty	0.1	Poverty gap	0.3	19.99	28.96	PovcalNet
		Gender equity	0.05	Ratio of female to male labour force participation	0.05	72.98	83.37	WDI
Accessibility	0.2	education	0.7	School enrollment in secondary	0.07	60.88	38.29	WDI
		Health	0.07	Mortality rate, under five	0.07	57.38	95.87	
		Access to water and sanitation	0.06	Water productivity, total	0.03	34.06	32.87	
				People using at least basic sanitation	0.03	49.38	27.19	
Governance	0.1	Governance	0.1	Corruption Perception Index	0.1	-.36	-.997	WGI

Source: Authors' calculations using data from the World Bank World Development Indicators (WDI), World Bank PovcalNet, World Income Inequality Database (WIID), the World Bank Worldwide Governance Indicators (WGI), and the Fund for Peace Fragile States Index.

Rather than relying on a binary fragility classification that would discard substantial cross-country variation in fragility intensity, we construct an ordinal index ranging from 1 to 3, with higher scores indicating greater fragility. Following Fowowe and Folarin (2019), countries are assigned to one of three categories based on their FSI score: those in the "*Alarm*" category ($FSI \geq 70$) are classified as the most fragile and assigned a score of 3; those in the "*Warning*" category ($50 \leq FSI < 70$) are classified as moderately fragile and assigned a score of 2; and those in the "*Stable*" category ($FSI < 50$) are classified as non-fragile and assigned a score of 1. Appendix Figure A1 presents the distribution of the FSI across the sample period and confirms substantial heterogeneity in fragility levels among the 40 African countries included in the analysis. While a large proportion of observations fall into the warning and alarm categories, a non-negligible share of observations lies below this threshold, and some countries exhibit comparatively moderate fragility levels over time. The distribution spans a wide range, from approximately 40 to above 110, confirming that the sample is not composed exclusively of uniformly fragile states and that the ordinal index captures meaningful variation in fragility intensity across the panel.

Financial inclusion index

The Financial Inclusion Index (FII) is constructed following the two-stage Principal Component Analysis (PCA) methodology developed by Tram et al. (2023), which allows the index to be built using endogenously determined weights rather than arbitrary assignments, thereby addressing a major limitation of earlier composite indices (Lockwood, 2004; Sarma, 2016). Consistent with this framework, financial inclusion is treated as a multidimensional construct organised around three complementary dimensions: penetration, availability, and usage of financial services. Importantly, the index explicitly integrates mobile money indicators to reflect the structural transformation of financial systems in Sub-Saharan Africa, where digital finance has emerged as the primary channel of inclusion in economies with limited conventional banking infrastructure (Chauvet and Jacolin, 2017; Mehrotra and Nadhanael, 2016). Before PCA implementation, all indicators are normalised using a min-max transformation to eliminate scale effects and ensure cross-country comparability. This normalisation ensures that each indicator ranges from 0 to 1 and prevents any single variable from dominating the composite measure due to scale differences, as recommended in the parametric index construction literature (Camara and Tuesta, 2018; Tram et al., 2023).

The first dimension, or penetration, captures the extent to which individuals are integrated into the formal financial system through account ownership, which constitutes the most fundamental step toward financial inclusion (Demirgüç-Kunt et al., 2015). Following Sarma (2016) and Tram et al. (2023), we include deposit accounts per 1,000 adults to capture formal integration into the banking system. However, limiting penetration to traditional bank accounts would substantially underestimate inclusion in African economies where mobile money services dominate. We therefore also incorporate mobile money accounts per 1,000 adults, consistent with Chauvet and Jacolin (2017) and Mehrotra and Nadhanael (2016). The penetration sub-index is defined as:

$$Y_i^P = \beta_1 DBaccounts_i + \beta_2 MMaccounts_i \quad \textbf{(Eq. 3)}$$

where β_1 and β_2 denote the factor loadings associated with the first principal component, ensuring that the measure captures both traditional and digital forms of account ownership.

The second dimension, or availability, reflects the extent to which financial service infrastructure is physically and digitally accessible. Following Sarma (2016) and Beck et al. (2007), we include bank branches and ATMs per 100,000 adults as traditional infrastructure indicators, capturing physical outreach and automated service accessibility, respectively. Given the rapid expansion of agent banking models in developing economies, we additionally include mobile money agents per 100,000 adults, which act as decentralised financial access points in areas where conventional banking infrastructure is absent (Donovan, 2012; Chauvet and Jacolin, 2017). The availability sub-index is constructed as:

$$Y_i^A = \gamma_1 Branches_i + \gamma_2 ATMs_i + \gamma_3 MMagents_i \quad \textbf{(Eq. 4)}$$

where the weights $\gamma_1, \gamma_2, \gamma_3$ are endogenously determined via PCA, ensuring that both conventional banking networks and digital distribution systems are captured.

The third dimension, or usage, captures the depth and intensity of financial intermediation. As emphasised by Kempson et al. (2004) and Sarma (2016), genuine financial inclusion requires not merely access but active and sustained use of financial services. We include outstanding deposits and outstanding loans as a percentage of GDP to measure savings mobilisation and credit provision, respectively, alongside mobile money transactions as a percentage of GDP to capture the frequency and economic significance of digital financial flows (Mehrotra and Nadhanael, 2016). The usage sub-index is defined as:

$$Y_i^U = \delta_1 Deposits_i + \delta_2 Loans_i + \delta_3 MMtransactions_i \quad \textbf{(Eq. 5)}$$

where $\delta_1, \delta_2, \delta_3$correspond to the PCA-derived loadings.

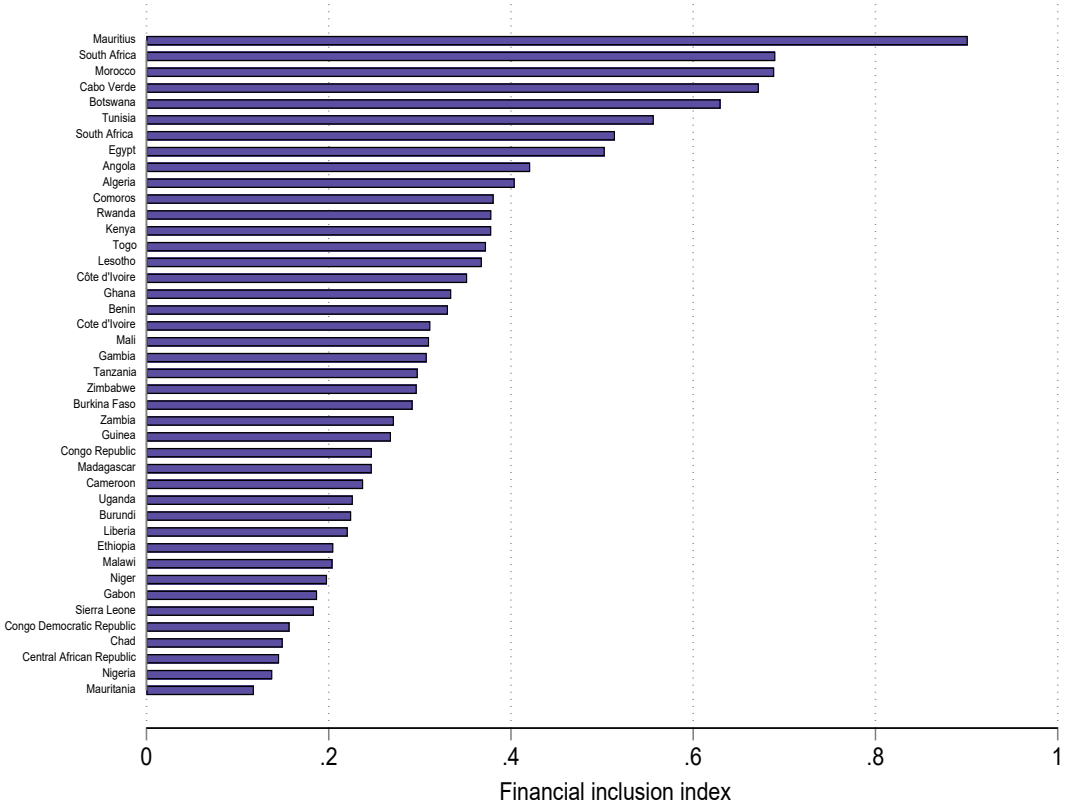
In the second stage, the three sub-indices are aggregated using PCA to construct the overall Financial Inclusion Index (FII):

$$FII_i = w_1 Y_i^P + w_2 Y_i^A + w_3 Y_i^U \quad \textbf{(Eq. 6)}$$

where w_1, w_2, w_3 are derived from the first principal component of the second-stage PCA. This hierarchical aggregation procedure, recommended by Camara and Tuesta (2018) and adopted by Tram et al. (2023), ensures that indicators are first combined within dimensions before being aggregated across dimensions, minimising bias from highly correlated variables while preserving the conceptual structure of financial inclusion. The composite FII is rescaled from 0 to 1 to facilitate interpretation, with values closer to 1 indicating higher financial inclusion and values closer to 0 reflecting financial exclusion.

The first-stage PCA results confirm the statistical adequacy of the constructed index. In each dimension, only the first principal component was retained, as its eigenvalue exceeded the Kaiser threshold of one: the first component explained approximately 52.5 per cent of total variance in the penetration dimension, 53.6 percent in the availability dimension (eigenvalue: 1.61), and 59.6 percent in the usage dimension (eigenvalue: 1.79), as reported in Appendix Table A2. In the second-stage PCA, the first principal component was similarly retained, confirming that the FII adequately summarises the common variation across the three dimensions, as reported in Appendix Table A3. Figure 1 displays the distribution of financial inclusion levels across African countries in the sample.

Figure 1. Financial Inclusion Index in Africa (2006 - 2024)



Source: Authors' calculations using data from the IMF Financial Access Survey (FAS) database.

Control variables

Following the related literature (Dollar and Kraay, 2004; Anand et al., 2013; Ofori et al., 2022), we include domestic investment, foreign direct investment (FDI), trade openness, population growth, and inflation as control variables. Prior studies provide consistent evidence of a positive relationship between investment, FDI, and trade openness and inclusive growth, while population growth and inflation are expected to exert adverse effects.

Table 2 presents descriptive statistics disaggregated by fragility category, while Figure 2 provides complementary graphical evidence on the relationships between inclusive growth, financial inclusion, and fragility. Together, these descriptive elements illuminate the empirical patterns underlying the econometric analysis that follows.

Table 2 reveals that countries classified as relatively stable generally record higher inclusive growth index values and more favourable governance indicators than those in the warning and alarm categories, with poverty and inequality measures also tending to be less severe in less

fragile contexts. Macroeconomic aggregates, however, do not display a strictly monotonic relationship with fragility. Trade openness and FDI inflows, in particular, are sometimes higher in more fragile economies - a pattern that likely reflects commodity dependence or enclave export structures rather than diversified, broad-based economic activity, and underscores the importance of controlling for these variables in the regression analysis rather than treating them as straightforward proxies for economic performance.

Figure 2 reinforces and refines these descriptive insights by illustrating the continuous relationship between inclusive growth and financial inclusion. The upper-left panel shows a strong positive association between overall FII and IGI: countries with higher levels of financial inclusion consistently record higher inclusive growth outcomes, with a positive, highly significant estimated coefficient. The lower panels decompose this relationship into the penetration, availability, and usage dimensions, all three of which exhibit positive correlations with inclusive growth, though with varying strength. The usage dimension shows the strongest association with the IGI, suggesting that active engagement with financial services is more closely linked to inclusive outcomes than mere account ownership or physical (or digital) infrastructure access.

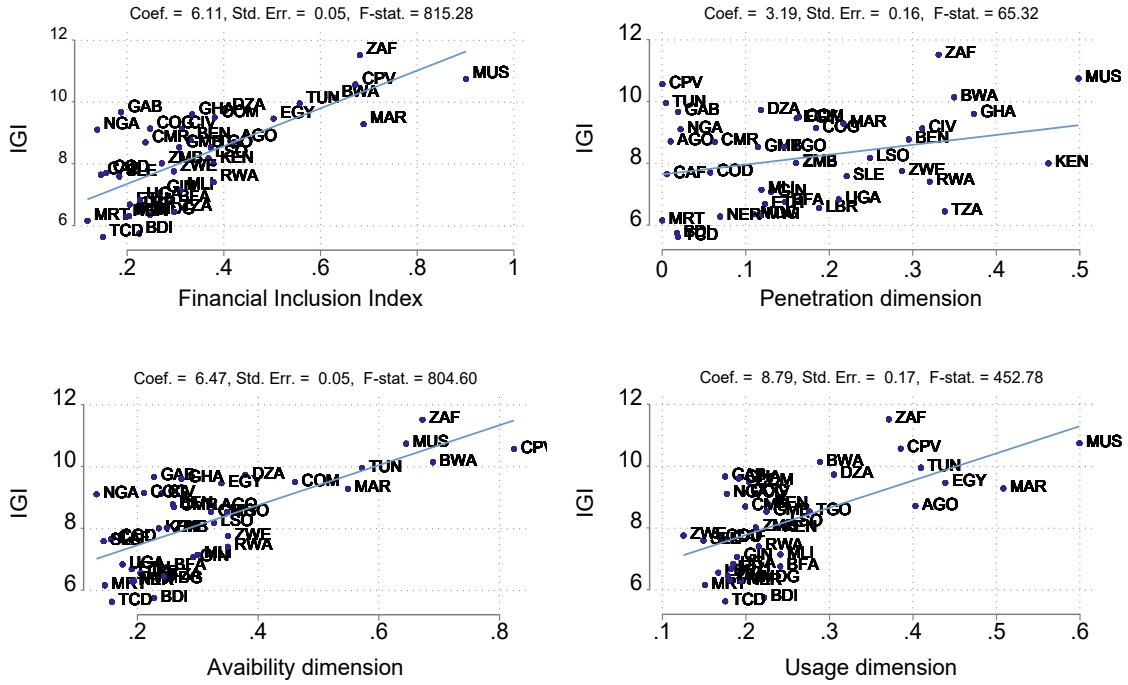
The correlation matrix reported in Appendix Table A4 confirms the expected patterns: the IGI is positively correlated with financial inclusion and negatively correlated with fragility, while financial inclusion and fragility are themselves negatively correlated, lending first-pass support to our central hypothesis.

Table 2. Descriptive statistics

FSI: 1	**Obs.**	**Mean**	**Std. Dev**	**Min**	**Max**
IGI	28	10.783	0.552	9.236	11.914
Financial inclusion, index	28	0.843	0.116	0.514	1
Penetration dimension	28	0.479	0.147	0	0.732
Availability dimension	28	0.684	0.113	0.472	0.921
Usage dimension	28	0.508	0.146	0.267	0.733
Trade (% of GDP)	28	110.449	27.463	53.768	147.664
FDI inflows	28	2.805	1.606	-1.702	5.4
Investment, log	28	4.251	0.439	3.397	4.959
Inflation	28	4.628	3.098	0.406	11.666
Population growth	28	0.471	0.685	-1.105	1.64
FSI: 2					
IGI	409	8.612	1.492	5.347	12.196
Financial inclusion, index	409	0.386	0.171	0.118	0.912
Penetration dimension	409	0.179	0.165	0	1
Availability dimension	409	0.361	0.179	0.126	1
Usage dimension	409	0.271	0.115	0.107	1
Trade (% of GDP)	409	67.773	26.764	27.963	165.049
FDI inflows	409	3.226	3.606	-7.212	23.999
Investment, log	409	2.971	0.767	1.16	4.859
Inflation	408	6.967	6.81	-16.86	47.643
Population growth	409	2.23	0.84	0.013	3.888
FSI: 3					
IGI	317	7.387	1.248	3.763	12.74
Financial inclusion, index	317	0.227	0.087	0	0.542
Penetration dimension	317	0.128	0.13	0	0.761
Availability dimension	317	0.216	0.085	0	0.69
Usage dimension	317	0.19	0.047	0	0.496
Trade (% of GDP)	317	56.418	26.807	16.35	148.587
FDI inflows	317	4.296	10.422	-17.292	103.337
Investment, log	317	2.423	0.618	0.528	3.621
Inflation	302	10.697	36.215	-8.975	557.202
Population growth	317	2.707	0.793	-0.799	5.59

Source: Authors' calculations. *Notes:* Countries are classified into three fragility categories based on their Fragile States Index (FSI) score: Stable ($FSI < 50$, coded 1), Warning ($50 \leq FSI < 70$, coded 2), and Alarm ($FSI \geq 70$, coded 3). Higher scores indicate greater fragility.

Figure 2. Correlation between inclusive growth and financial inclusion index (2006 – 2024)



Source: Financial Access Survey and authors' calculations.

4. Empirical results

4.1 Baseline findings

As a preliminary step, Table 4 reports Ordinary Least Squares (OLS) fixed-effects estimates of the impact of state fragility on inclusive growth, with standard errors corrected for heteroscedasticity, autocorrelation, and cross-sectional dependence using the Driscoll-Kraay (1998) estimator. Column (1) presents the baseline specification without control variables and establishes that state fragility significantly undermines inclusive growth, with a coefficient of −1.025 ($p < 0.01$). This finding is consistent with the theoretical framework developed in Section 2 and with stylised evidence from fragile African states, where institutional weakness, political instability, and governance breakdowns disrupt productive investment, reduce employment opportunities, and weaken redistributive mechanisms (Miksjuk et al., 2026). When financial inclusion is introduced in column (2), the FSI coefficient declines substantially in magnitude to −0.323 ($p < 0.01$), while financial inclusion enters positively and highly significantly (0.895, $p < 0.01$). As control variables are progressively incorporated in columns (3) to (7), these core findings remain robust: in the fully specified model, FSI continues to exert a significant negative effect (−0.203, $p < 0.05$) while financial inclusion remains positively associated with inclusive growth (0.239, $p < 0.01$).

However, static estimations are subject to dynamic panel bias and endogeneity concerns (Nickell, 1981). Inclusive growth is likely to be persistent over time, and reverse causality may exist among economic performance, fragility, and financial inclusion. To address these concerns, Table 4 reports two-step system GMM estimates, which constitute the preferred specification throughout the analysis.

The dynamic results confirm the persistence of inclusive growth. The lagged dependent variable is positive and statistically significant across all specifications. In the fully specified model (column 7), the coefficient on lagged IGI is 0.276 ($p < 0.01$), indicating that approximately 27.6 per cent of past inclusive growth carries over into the current period, reflecting the gradual nature of institutional and economic transformation in African economies. The diagnostic tests uniformly support the validity of the dynamic specification: the Hansen test consistently fails to reject instrument validity, the AR(2) test confirms the absence of second-order serial correlation, and the number of instruments remains below the number of countries across all specifications, guarding against instrument proliferation.

Critically, the negative impact of state fragility on inclusive growth remains robust in the dynamic framework. In the fully specified GMM model (column 7), the FSI coefficient is −0.208 ($p < 0.01$), confirming that fragility persistently depresses inclusive growth even after accounting for dynamics and endogeneity. Financial inclusion remains positive and highly significant (0.194, $p < 0.01$), reinforcing its growth-enhancing role across all specifications and consistent with the broader literature (Corrado and Corrado, 2017; Demirgüç-Kunt et al., 2017; Omar and Inaba, 2020).

Because the specification includes a lagged dependent variable, the estimated coefficients reflect short-run effects. The implied long-run effects are recovered using the standard dynamic multiplier $\beta/(1-\rho)$, where ρ denotes the coefficient on the lagged dependent variable. Based on column (7), where $\rho = 0.276$, the long-run impact of state fragility is approximately −0.287, indicating that a one-unit increase in fragility ultimately reduces inclusive growth by nearly 0.29 units, reflecting the cumulative and compounding consequences of institutional weakness, insecurity, and governance failures over time. The long-run effect of financial inclusion is approximately 0.268, suggesting that improvements in financial inclusion generate sustained and economically meaningful increases in inclusive growth. The near-symmetry between these two long-run effects constitutes a structurally important finding: the positive contribution of financial inclusion (+0.27) nearly offsets the negative impact of fragility

(−0.29), suggesting that deepening financial inclusion can substantially mitigate, though not fully eliminate, the structural constraints that fragility imposes on inclusive growth.

Overall, both static and dynamic estimates consistently confirm that state fragility undermines inclusive growth while financial inclusion plays a robust compensatory role. The near-offsetting long-run effects provide a first indication of financial inclusion's moderating potential, motivating the explicit interaction analysis reported in the following section.

4.2 Interaction analysis: Does financial inclusion moderate the adverse effect of state fragility on inclusive growth?

Table 5 reports the interaction analysis between state fragility and financial inclusion using the two-step system GMM estimator. Column (1) introduces the interaction term between state fragility and the composite financial inclusion index (FSI × FII), while columns (2) to (7) decompose financial inclusion into its three constituent dimensions to identify the specific channels through which moderation operates.

The interaction term $FSI \times FII$ carries a positive and statistically significant coefficient (2.076, $p < 0.01$), while the direct effect of fragility remains negative (−0.740, $p < 0.05$). The joint significance test (20.35, $p < 0.01$) confirms that the interaction is meaningful beyond the individual coefficients. These results indicate that financial inclusion significantly moderates the negative impact of state fragility on inclusive growth, supporting the central hypothesis advanced in Section 2.3. Formally, the marginal effect of fragility on inclusive growth is given by:

$$\frac{\partial IGI}{\partial FSI} = \beta_{FSI} + \beta_{FSI \times FII} \cdot FII \qquad \textbf{Eq. (7)}$$

Setting this expression to zero yields a critical threshold of financial inclusion:

$$FII^{*} = \frac{0.740}{2.076} \approx 0.356 \qquad \textbf{Eq. (8)}$$

This implies that when the financial inclusion index exceeds approximately 0.36 on the normalised 0–1 scale, the adverse impact of fragility on inclusive growth is fully neutralised. Below this threshold, fragility hinders inclusive growth; above it, financial inclusion is sufficiently developed to offset fragility's harmful effects entirely.

Table 3. State Fragility, Financial Inclusion, and Inclusive Growth in Africa: Static Estimates

	Dependent variable: Inclusive growth index						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FSI	-1.025***	-0.323***	-0.349***	-0.305***	-0.305***	-0.268***	-0.203**
	(0.064)	(0.106)	(0.094)	(0.097)	(0.097)	(0.087)	(0.085)
FII		0.895***	0.671***	0.669***	0.669***	0.658***	0.239***
		(0.113)	(0.129)	(0.125)	(0.125)	(0.121)	(0.067)
Population growth			-0.522***	-0.468***	-0.468***	-0.500***	-0.296***
			(0.097)	(0.093)	(0.093)	(0.096)	(0.072)
Trade (% of GDP)				0.925***	0.925***	1.076***	1.170***
				(0.261)	(0.261)	(0.193)	(0.222)
FDI inflows				0.006*	0.006*	0.005*	0.004*
				(0.003)	(0.003)	(0.003)	(0.002)
Investment, log						-0.000	0.001*
						(0.001)	(0.001)
Inflation							0.028***
							(0.002)
Countries fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	754	754	754	754	754	738	738
R-squared	0.694	0.812	0.835	0.841	0.841	0.847	0.883
Number of countries	40	40	40	40	40	40	40

Note: The sample period goes from 2006 to 2021. ***, **, * indicate statistical significance at the 1 %, 5 % and 10 % level, respectively. Driscoll-Kray standard errors are reported in brackets. Unreported constant included.

Table 4. State Fragility, Financial Inclusion, and Inclusive Growth in Africa: Dynamic Estimates

	Dependent variable: IGI						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged IGI	0.532***	0.452***	0.150***	0.254***	0.279***	0.312***	0.276***
	(0.024)	(0.047)	(0.049)	(0.038)	(0.042)	(0.051)	(0.052)
FSI	-0.115***	-0.090***	-0.191***	-0.165***	-0.153***	-0.197***	-0.208***
	(0.021)	(0.026)	(0.063)	(0.044)	(0.053)	(0.049)	(0.056)
FII		0.206***	0.182***	0.180***	0.169***	0.177***	0.194***
		(0.041)	(0.042)	(0.030)	(0.042)	(0.035)	(0.038)
Population growth			-0.358***	-0.221***	-0.272***	-0.217***	-0.231***
			(0.039)	(0.028)	(0.038)	(0.040)	(0.047)
Trade (% of GDP)				0.226	-0.523***	-0.446*	-0.520*
				(0.188)	(0.150)	(0.259)	(0.261)
FDI inflows					0.006***	0.005***	0.005***
					(0.001)	(0.001)	(0.001)
Investment, log						-0.007***	-0.007***
						(0.002)	(0.002)
Inflation							-0.005
							(0.005)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	714	714	714	714	714	700	700
Number of countries	40	40	40	40	40	40	40
Number of instruments	21	27	27	31	30	30	30
AR (1)	0.064	0.067	0.065	0.068	0.067	0.074	0.078
AR (2)	0.119	0.199	0.898	0.468	0.483	0.371	0.455
Hansen test	0.576	0.501	0.119	0.170	0.135	0.165	0.131
Wald test	501.17***	93.35***	9.41***	43.80***	43.97***	38.02***	28.15***

Note: The sample covers the period 2006–2021. All specifications are estimated using the two-step system GMM estimator. Robust standard errors are reported in brackets. We report standard diagnostic statistics for dynamic panel models: (i) the number of instruments; (ii) the AR(1) and AR(2) tests for first- and second-order serial correlation in first differences; (iii) the Hansen test of overidentifying restrictions (p-values reported); and (iv) the Wald test of joint significance of the estimated coefficients. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include an unreported constant term.

Table 5. Financial Inclusion as a Moderator of State Fragility's Adverse Effect on Inclusive Growth in Africa

	Dependent variable: IGI						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged IGI	0.079	0.218***	0.157***	0.236***	0.199***	0.636***	0.110***
	(0.064)	(0.049)	(0.037)	(0.039)	(0.032)	(0.033)	(0.040)
FSI	-0.740**	-0.459***	-0.539***	-0.667***	-0.800***	-0.151**	-0.537***
	(0.309)	(0.101)	(0.148)	(0.187)	(0.159)	(0.058)	(0.190)
Financial inclusion index (FII)	5.205***						
	(1.606)						
FSI * FII	2.076***						
	(0.735)						
Penetration Dimension (PEN)		0.490**	5.557***				
		(0.237)	(1.301)				
FSI * PEN			1.679***				
			(0.505)				
Availability Dimension (AVA)				1.411***	3.969***		
				(0.313)	(1.184)		
FSI * AVA					0.163**		
					(0.065)		
Usage Dimension (USA)						1.307***	7.652***
						(0.276)	(2.696)
FSI * USA							0.373***
							(0.095)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	700	700	700	700	700	700	700
Number of countries	40	40	40	40	40	40	40
Number of instruments	32	32	30	35	35	33	35
AR (1)	0.020	0.065	0.071	0.065	0.070	0.069	0.09
AR (2)	0.258	0.562	0.849	0.286	0.559	0.101	0.924
Hansen test	0.0665	0.253	0.247	0.103	0.0769	0.209	0.236
Wald test	32.94***	19.49***	83.98**	37.35***	37.46***	373.81***	7.66***
Joint test significance	20.35***	-	7.20***	-	18.06***	-	8.49***
Marginal effect of FSI							
At the mean of FII	-0.010	-	-0.088	-	-0.737	-	-0.399
At the 25th percentile of FII	-0.294	-	-0.345	-	-0.927	-	-0.676
At the 50th percentile of FII	-0.099	-	0.050	-	-0.636	-	-0.239
At the 75th percentile of FII	0.132	-	0.352	-	-0.403	-	0.211

Note: The sample covers the period 2006–2021. All specifications are estimated using the two-step system GMM estimator. Robust standard errors are reported in brackets. We report standard diagnostic statistics for dynamic panel models: (i) the number of instruments; (ii) the AR(1) and AR(2) tests for first- and second-order serial correlation in first differences; (iii) the Hansen test of overidentifying restrictions (p-values reported); and (iv) the Wald test of joint significance of the estimated coefficients. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include an unreported constant term.

The marginal effect analysis corroborates this threshold pattern: at the 25th percentile of FII, the marginal effect of fragility is negative and economically sizable (-0.294), declines to -0.099 at the median, and turns positive at 0.132 at the 75th percentile. This progressive attenuation confirms the presence of a nonlinear, compensatory relationship between financial inclusion and fragility, consistent with the resilience-and-risk-sharing channel developed in Section 2.3.

To identify the specific channels through which this moderation operates, columns (2) to (7) replace the composite FII with its three constituent dimensions. The interaction term between fragility and each dimension is positive and statistically significant across all sub-specifications. However, the magnitude and implied thresholds differ meaningfully, shedding light on the relative importance of each channel.

The penetration dimension yields an interaction coefficient of $FSI \times PEN = 1.679$ ($p < 0.01$), with a joint significance test of 7.20 ($p < 0.01$). The marginal effect of fragility turns positive at the 75th percentile of penetration (0.352), confirming that sufficiently widespread account ownership effectively neutralises fragility's growth costs. This result directly validates the resilience and risk-sharing channel identified in Section 2.3: greater account penetration, encompassing both bank and mobile money accounts, enhances households' savings capacity, facilitates remittances, and improves financial security for vulnerable populations, enabling consumption smoothing in the absence of effective state-provided safety nets. It simultaneously corroborates the digital substitution channel, insofar as mobile money account ownership constitutes the primary gateway to financial services in fragile African states where conventional banking infrastructure is absent or destroyed.

The availability dimension also plays a moderating role, with an interaction coefficient of $FSI \times AVA = 0.163$ ($p < 0.05$) and a joint significance test of 18.06 ($p < 0.01$). Expanding financial infrastructure (i.e., bank branches, ATMs, and mobile money agents) helps cushion the impact of fragility by lowering transaction costs and extending service outreach to previously excluded populations, consistent with the digital substitution channel. However, the marginal effect of fragility remains negative across all availability percentiles, ranging from −0.927 at the 25th percentile to −0.403 at the 75th percentile, and the interaction coefficient is considerably smaller in magnitude than those for penetration and usage. This indicates that the mere physical presence of financial infrastructure, while moderating, is insufficient on its own to neutralise fragility's adverse effects, underscoring that infrastructure constitutes a necessary but not sufficient condition for moderation.

The strongest moderating effect emerges from the usage dimension, where the interaction coefficient $FSI \times USA = 0.373$ ($p < 0.01$) and the joint significance test of 8.49 ($p < 0.01$) are both highly significant. The marginal effect of fragility turns positive at the 75th percentile of usage (0.211), and

the implied threshold is lower than that of the other dimensions, indicating that increasing the intensity of financial activity is particularly effective in fragile environments even at moderate levels of engagement. This result speaks directly to the entrepreneurship and credit channel and the human capital accumulation channel. Usage captures the depth of financial intermediation (deposits, credit flows, and digital transactions) rather than mere account ownership or infrastructure presence, and it is through active financial engagement that households and firms finance productive investment, sustain micro-enterprise activity, and privately fund education and health expenditures when public service delivery has collapsed. The prominence of the usage dimension also reinforces the women's economic empowerment channel: it is the active use of financial services, rather than nominal access, that most effectively shifts intra-household resource allocation.

Taken together, the dimension-level results reveal a clear hierarchy in the moderating effectiveness of financial inclusion's components: $usage > penetration > availability$, reflecting the deeper logic that active and sustained engagement with financial services, rather than passive availability, most powerfully enables households and firms to substitute for the growth-enabling functions of the state that fragility erodes.

Overall, the interaction analysis demonstrates that financial inclusion not only directly promotes inclusive growth but also, under certain conditions, mitigates the adverse effects of fragility. The presence of a measurable threshold effect strengthens the policy relevance of the findings: achieving a sufficiently high level of financial inclusion, particularly in terms of active use, can substantially neutralise the developmental costs of fragility. Moreover, the presence of measurable threshold effects across all three dimensions strengthens the policy relevance of these findings: achieving a sufficiently high level of financial inclusion, particularly in terms of active usage, can substantially neutralise the developmental costs of fragility in Africa.

4.3 Robustness checks

To assess the robustness of our baseline results, we conduct two sets of specification checks in this section: controlling for income-level heterogeneity and employing alternative measures of inclusive growth.

4.3.1 Geographical and income-level heterogeneity

Table 6 examines whether the fragility-inclusive growth nexus varies across income groups by augmenting the baseline specification with interaction terms between the FSI and dummy variables for three income categories: low-income countries (LICs), lower-middle-income countries (LMCs), and upper-middle-income countries (UMCs). The baseline coefficient on FSI remains negative and

statistically significant across most specifications, confirming the robustness of the core finding that fragility undermines inclusive growth. The direct effect of financial inclusion also remains positive and significant throughout, reinforcing the baseline results. For low-income countries, the interaction term is negative and highly significant ($FSI \times LIC = -0.645$, $p < 0.01$), indicating that fragility exerts a particularly severe adverse impact in the poorest economies, consistent with their limited institutional buffers and constrained fiscal capacity to absorb fragility shocks. In lower-middle-income countries, the interaction term is positive and significant ($FSI \times LMC = 0.353$, $p < 0.01$), suggesting that these economies possess sufficient structural capacity, including more diversified production structures, deeper financial systems, and improved governance, to absorb fragility-related shocks partially. For upper-middle-income countries, the interaction term is statistically insignificant ($FSI \times UMC = -0.001$), indicating that fragility's marginal impact does not differ significantly from the baseline in economies with stronger institutional frameworks and more developed financial systems. Overall, Table 6 documents substantial cross-country heterogeneity in the fragility–inclusive growth relationship: fragility is most damaging in LICs.

4.3.2 Alternative measures of inclusive growth

Table 7 assesses the robustness of the baseline findings by replacing the IGI with four alternative measures of inclusive growth widely used in the literature: the Inclusive Development Index (IDI), GDP per capita (Cabeza-García et al., 2019; Ofori et al., 2022), the Human Development Index (HDI; Jombo, 2021), and the log difference of GDP per person (Anand et al., 2013). Across all four measures and all specifications, the coefficient on state fragility remains negative and statistically significant, ranging from -0.006 (HDI) to -0.221 (GDP per capita) in the interaction specifications, confirming that fragility's adverse effect on inclusive growth is not an artefact of the particular index construction adopted in the baseline. Financial inclusion remains positive and significant in all non-interaction specifications, while the interaction term $FSI \times FII$ is positive and statistically significant across all four alternative measures (IDI: 0.452, $p < 0.01$; $GDP\ per\ capita$: 0.608, $p < 0.01$; HDI: 0.018, $p < 0.01$; $log\ difference\ GDP\ per\ person$: 0.462, $p < 0.01$). This consistent pattern across conceptually distinct measures of inclusive growth, spanning multidimensional welfare indices, income-based measures, and human development indicators, provides strong evidence that financial inclusion's moderating role is robust to the choice of dependent variable and is not driven by the specific construction of the IGI. The diagnostic tests support the validity of all specifications: the Hansen test fails to reject instrument validity, and the AR(2) test confirms the absence of second-order serial correlation throughout.

Table 6. Income-Level Heterogeneity in the Fragility–Inclusive Growth Relationship

	Dependent variable: IGI		
	(6)	(7)	(8)
Lagged IGI	0.308***	0.390***	0.392***
	(0.027)	(0.051)	(0.037)
FSI	0.190	-0.300***	-0.188***
	(0.131)	(0.081)	(0.050)
FII	0.223***	0.216***	0.141***
	(0.045)	(0.040)	(0.038)
FSI_LIC	**-0.645*** **		
	(0.208)		
FSI_LMC		0.353***	
		(0.097)	
FSI_UMC			-0.001
			(0.148)
Control variables	Yes	Yes	Yes
Observations	700	700	700
Number of countries	40	40	40
Number of instruments	32	33	34
AR (1)	0,074	0,076	0,070
AR (2)	0.513	0.530	0.357
Hansen test	0.216	0.261	0.160
Wald test	127.3***	58.19***	109.9***

Note: The sample goes from 2006 to 2021. All estimations are based on the two-step system GMM estimator. Robust standard errors are reported in brackets. We reported the following diagnostic tests: (i) the number of instruments; (ii) AR (1) and AR (2) are the test statistics for first-order and second-order serial correlation, respectively; (iii) Hansen test reports p-value for over-identification restrictions; and (iv) the Wald test for joint significant of parameters. ***, **, * indicate statistical significance at the 1 %, 5 % and 10 % level, respectively. Unreported constant included.

Table 7. Robustness to Alternative Measures of Inclusive Growth

Dependent variable	IDI		GDP per capita		HDI		Ln DIFF GDP per person	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IDI $_{t-1}$	0.659***	0.925***						
	(0.046)	(0.173)						
GDP per capita $_{t-1}$			0.942***	0.989***				
			(0.015)	(0.019)				
HDI $_{t-1}$					0.939***	0.893***		
					(0.017)	(0.004)		
Log Diff GDP per Person $_{t-1}$							-0.366***	-0.202***
							(0.041)	(0.006)
FSI	-0.028***	-0.130***	-0.040***	-0.221***	-0.006***	-0.011***	-0.014**	-0.117***
	(0.010)	(0.037)	(0.008)	(0.040)	(0.001)	(0.001)	(0.006)	(0.022)
FII	0.005**	0.143***	0.023**	0.192***	0.005***	0.010***	-0.025***	0.123***
	(0.003)	(0.043)	(0.011)	(0.033)	(0.002)	(0.001)	(0.005)	(0.020)
FSI*FII		0.452***		0.608***		0.018***		0.462***
		(0.128)		(0.094)		(0.004)		(0.056)
Controls variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Times fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	628	628	700	700	670	670	674	674
Number of countries	36	36	40	40	40	40	40	40
Number of instruments	30	30	30	30	29	29	29	29
AR (1)	0.003	0.000	0.005	0.004	0.049	0.052	0.024	0.008
AR (2)	0.769	0.0613	0.293	0.437	0.354	0.361	0.011	0.105
Hansen test	0.615	0.388	0.149	0.113	0.145	0.640	0.081	0.188
Wald Test	256.90***	153.03***	21.06***	27.15**	30.84***	44.34***	78.68***	976.33***

Note: The sample goes from 2006 to 2021. All estimations are based on the two-step system GMM estimator. Robust standard errors are reported in brackets. We reported the following diagnostic tests: (i) the number of instruments; (ii) AR (1) and AR (2) are the test statistics for first-order and second-order serial correlation, respectively; (iii) Hansen test reports p-value for over-identification restrictions; and (iv) the Wald test for joint significant of parameters. ***, **, * indicate statistical significance at the 1 %, 5 % and 10 % level, respectively. Unreported constant included.

5. Conclusion

This paper examines the moderating role of financial inclusion in the relationship between state fragility and inclusive growth in Africa. Drawing on a panel of 40 African countries over the period 2006–2024 and employing the two-step system GMM estimator to address persistence and endogeneity, we establish three principal findings. First, state fragility significantly and persistently undermines inclusive growth - a result that is robust across static and dynamic specifications, alternative measures of inclusive growth, and controls for income-level heterogeneity. Second, financial inclusion exerts a positive and significant direct effect on inclusive growth, with a long-run impact (+0.27) that nearly offsets the long-run contractionary effect of fragility (−0.29). Third, and most importantly, financial inclusion significantly moderates the adverse effect of state fragility on inclusive growth: beyond a critical threshold of approximately 0.36 on the normalised financial inclusion index, the growth-suppressing effect of fragility is fully neutralised. Decomposing financial inclusion into its constituent dimensions reveals a clear hierarchy of moderating effectiveness - $usage > penetration > availability$, indicating that it is the active and sustained engagement with financial services, rather than mere account ownership or infrastructure presence, that most powerfully substitutes for the growth-enabling functions of the state that fragility erodes.

These findings carry important policy implications. Financial inclusion emerges as a strategic instrument for advancing inclusive development in fragile institutional environments, but its effectiveness depends critically on complementary reforms and enabling conditions. Several priority actions follow from the evidence. Expanding the reach of financial services through mobile money and microfinance institutions is essential to serving underserved and marginalised populations, particularly women and youth, in areas where conventional banking infrastructure is absent. Deepening the usage dimension through digital credit, savings mobilisation, and mobile payment ecosystems is especially critical given its superior moderating effectiveness. It should be prioritised over infrastructure expansion alone in resource-constrained, fragile settings. Establishing regulatory and supervisory frameworks that foster competition, financial stability, and consumer protection will be necessary to ensure that financial sector expansion translates into effective inclusion rather than mere deepening. Investment in complementary infrastructure (i.e., telecommunications, electricity, and transport networks) is equally important to reduce transaction costs and extend the reach of digital finance to remote and conflict-affected areas. Finally, financial literacy programmes are essential to

empower citizens to use financial tools effectively, converting access into meaningful and sustained engagement.

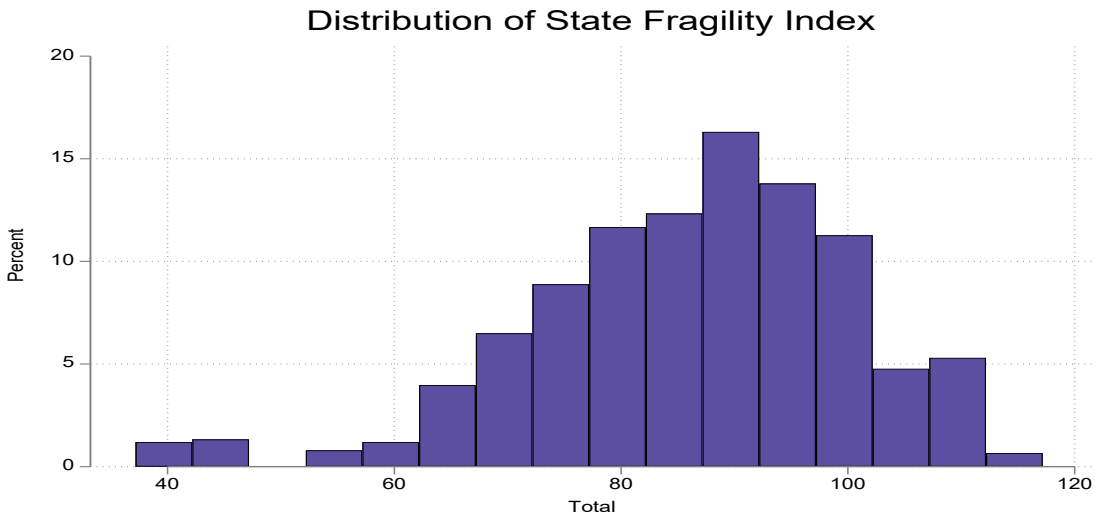
While financial inclusion is a powerful moderating instrument, it should not be viewed as a substitute for the deeper institutional and structural reforms required to address the root causes of fragility. Sound macroeconomic management, improvements in governance, and strengthening of the social contract between the state and its citizens remain essential long-run complements to financial sector development. The near-offsetting long-run effects of financial inclusion and fragility documented in this paper suggest that these two agendas are mutually reinforcing: as financial inclusion deepens, it reduces economic vulnerability and grievances that perpetuate fragility, while reducing fragility, in turn, creates the institutional conditions under which financial inclusion can operate most effectively. Pursuing both simultaneously, rather than sequentially, offers the most credible pathway toward inclusive, resilient, and sustainable growth in Africa.

Annexes

Table A1. List of countries and ISO 3 code

Algeria (DZA)	Congo, Dem. Rep. (COD)	Liberia (LBR)	South Africa (ZAF)
Angola (AGO)	Congo, Rep. (COG)	Madagascar (MDG)	Tanzania (TZA)
Benin (BEN)	Cote d'Ivoire (CIV)	Malawi (MWI)	Togo (TGO)
Botswana (BWA)	Egypt (EGY)	Mali (MLI)	Tunisia (TUN)
Burkina Faso (BFA)	Ethiopia (ETH)	Mauritania (MRT)	Uganda (UGA)
Burundi (BDI)	Gabon (GAB)	Mauritius (MUS)	Zambia (ZMB)
Cabo Verde (CPV)	Gambia (GMB)	Morocco (MAR)	Zimbabwe (ZWE)
Cameroon (CMR)	Ghana (GHA)	Niger (NER)	
Central African Republic (CAF)	Guinea (GIN)	Nigeria (NGA)	
Chad (TCD)	Kenya (KEN)	Rwanda (RWA)	
Comoros (COM)	Lesotho (LSO)	Sierra Leone (SLE)	

Figure A1: Distribution of the Fragile States Index (2006–2024)



Source: Authors' construction using data from the Fund for Peace Fragile States Index.

Table A2. Principal component estimates for the financial inclusion sub-indices

Component	Eigenvalue	Difference	Proportion	Cumulative
(1) Penetration (DB accounts, MMaccounts) - Estimate Y^p				
Comp1	**1.01**	0.18	0.55	0.55
Comp2	0.91		0.45	1
(2) Availability (Branches; ATMs and MMagents) – Estimate Y^a				
Comp1	**1.59**	.61	0.53	0.53
Comp2	.97	.54	0.33	0.86
Comp3	.44		0.14	1
(3) Usage (Deposits; Loans and MM transactions) - Estimate Y^u				
Comp1	**1.62**	0.64	0.54	0.54
Comp2	0.98	0.57	0.33	0.87
Comp3	0.40		0.133	1

Source: Authors' calculations using data from the IMF Financial Access Survey (FAS) database.

Table A3. Principal component estimates for the overall financial inclusion index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	**1.78**	0.89	0.73	0.73
Comp2	0.89	0.57	0.16	0.89
Comp3	0.32		0.11	1

Source: Authors' calculations using data from the IMF Financial Access Survey (FAS) database.

Table A4. Correlation matrix

Variables	(1) IGI	(2) FSI	(3) FII	(4) Trade	(5) FDI	(6) Investment	(7) Inflation	(8) Pop. growth
(1) IGI	1.000							
(2) FSI	-0.488*	1.000						
(3) FII	0.657*	-0.617*	1.000					
(4) Trade	0.273*	-0.320*	0.321*	1.000				
(5) FDI	-0.103*	0.074	-0.130*	0.271*	1.000			
(6) Investment	0.529*	-0.467*	0.763*	0.247*	-0.091	1.000		
(7) Inflation	-0.064	0.082	-0.046	-0.080	-0.026	-0.159*	1.000	
(8) Pop. growth	-0.589*	0.415*	-0.664*	-0.362*	0.092	-0.580*	-0.010	1.000

Source: Authors' calculations. *Note:* * denotes statistical significance at the 1% level

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Nairobi 00200, Kenya
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