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Diffusion of Innovation vs. Dependence Theory: FinTech Inclusion in the AfCFTA Era

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Abstract

The African Continental Free Trade Area (AfCFTA) aspires to accelerate digital financial integration across Africa, yet the diffusion of FinTech innovations shows uneven patterns shaped by deep-seated power structures. This study examines how FinTech adoption is spreading in AfCFTA member states and how structural dependencies influence this process, through the dual lenses of Diffusion of Innovation (DOI) theory and Dependency Theory. The study employed a convergent mixed-methods approach, combining case studies of Kenya, Nigeria, Rwanda, and Egypt with quantitative analyses of open datasets (e.g. GSMA, World Bank Findex) and qualitative discourse analysis of policies. Our findings reveal that while mobile money and digital finance are being rapidly adopted – reaching one-third of adults in Sub-Saharan Africa on average – the benefits remain uneven and often constrained by external dependencies (foreign investment, technology, and data infrastructure). DOI theory helps explain how local innovations and social networks drive FinTech inclusion (for example, Africa hosts 12 countries where mobile wallets now surpass bank accounts), whereas Dependency Theory exposes persistent asymmetries such as reliance on foreign tech giants and capital. Achieving digital sovereignty under AfCFTA requires addressing these structural challenges. Key contributions include a novel conceptual model of innovation diffusion under dependency constraints and actionable recommendations for policymakers, industry, and development partners. Implications: Without

strategic interventions, FinTech's promise to foster financial inclusion and intra-African integration may be undermined by digital neo-colonialism. However, with coordinated AfCFTA frameworks, capacity building, and localized innovation, Africa can harness FinTech for equitable growth.

Keywords: AfCFTA; FinTech inclusion; innovation diffusion; digital sovereignty; dependency theory; Africa; financial integration.

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1. Intoduction

Africa is witnessing a rapid expansion of financial technology (FinTech) innovations, from mobile money platforms to digital lending and payment apps. The launch of the African Continental Free Trade Area (AfCFTA) in 2021 marked a pivotal effort to unite 55 countries into a single market, including ambitions for digital financial integration. AfCFTA's Protocol on Digital Trade, adopted in 2023, explicitly encourages member states to collaborate in FinTech and adopt common standards (Puja & Lawack, 2024). A forthcoming dedicated FinTech Annex under this protocol will address how to harness FinTech for Africa's development (Puja & Lawack, 2024). The AfCFTA framework thus provides a timely context to examine how financial innovations spread across borders and what barriers or power structures shape their adoption.

Diffusion of Innovation (DOI) theory offers one lens to understand FinTech uptake. Everett Rogers' seminal work (1962) defined diffusion as a process by which an innovation is communicated over time among members of a social system (Rogers, 2003, 5th ed.). DOI theory identifies factors such as relative advantage, compatibility, and social networks that influence adoption rates. Classic diffusion studies – from the spread of hybrid corn seeds by Ryan and Gross in the 1940s, to Rogers' comprehensive synthesis in *Diffusion of Innovations* – demonstrate that new ideas typically follow an S-curve: slowly adopted by innovators and early adopters, then accelerating through the early majority, before reaching saturation with laggards (Rogers, 2003, 5th ed.).

In the FinTech domain, mobile money in Africa has become a paradigmatic case of rapid diffusion. A realist-constructivist reading suggests that M-Pesa's success also hinged on a hermeneutic spiral in which users' tacit trust recursively legitimised the platform (Bhaskar, 1979). The M-Pesa mobile payment system, launched in Kenya in 2007, is often cited as a leapfrog innovation that achieved massive adoption in a short time. Suri and Jack's influential study (2016) estimated that M-Pesa lifted 2% of Kenyan households out of extreme poverty (Suri & Jack, 2016; Bernards, 2022), a finding widely cited in media and policy circles as evidence of FinTech's transformative potential. Other studies applying DOI in Africa highlight how perceived usefulness and peer networks drive adoption of services like mobile banking and digital credit (e.g. *Kikulwe et al., 2014* on mobile payments in agriculture; *GSMA, 2021* on mobile money usage). These works broadly echo Rogers' proposition that when an innovation meets a clear need and is spread through trusted channels, uptake can be rapid and wide-ranging.

However, a solely innovation-centric view risks overlooking how structural power imbalances affect technology adoption. Here, Dependency Theory provides a critical counter-lens. Dependency theorists argue that global economic relations since colonial times have created a *core-periphery* dynamic, in which wealthy "core" countries extract resources and value from the poorer "periphery," hindering the latter's autonomous development (Frank, 1967; Cardoso & Faletto, 1979). Originally formulated to explain underdevelopment in Latin America, dependency theory was later applied to Africa to critique the lingering effects of colonialism and neocolonialism on African economies (Rodney, 1972).

In the context of technology and finance, dependency manifests as reliance on foreign capital, expertise, and infrastructure – a phenomenon some have termed *digital neo-colonialism (*Isah, 2025). For instance, despite Africa's burgeoning fintech startups and innovations, much of the digital backbone (cloud servers, payment networks, operating systems) is controlled by non-African corporations *(*Isah, 2025). Modern observers warn that Africa's enthusiastic embrace of digital solutions might entrench new forms of dependency: *"In the 21st century, Africa faces a new form of colonization...through cables, clouds, and code,"* writes Isah (2025), noting that African data and digital transactions largely run on foreign-controlled systems. Such warnings align with dependency theory's core contention that integration into global markets on unequal terms can perpetuate exploitation rather than eliminate it (Frank, 1967; Cardoso & Faletto, 1979)

This study posits that FinTech diffusion in Africa is shaped by a tension between innovation pathways – which DOI theory helps illuminate – and structural constraints – which dependency perspectives reveal. On one hand, Africa has become a global leader in certain financial innovations: by 2022, all 12 countries worldwide where mobile money accounts outnumber bank accounts were in Africa (World Bank, 2024), underscoring how African consumers and entrepreneurs have leapfrogged traditional banking. On the other hand, the *power structures* behind this diffusion raise concerns. For example, roughly 80% of funding for African tech startups comes from abroad, chiefly North America and Europe (Field et al., 2025). Foreign venture capital has fueled many African fintech successes, but it also means external stakeholders hold significant influence over Africa's digital finance sector (Field et al., 2025).

Similarly, critical digital infrastructure is externally owned: over 80% of African data is stored in servers outside Africa, mainly in Europe and the US (AU, 2022), a dependency that *"restricts local innovation and subjects African nations to foreign regulatory frameworks" (*Malcolm, 2025). These patterns evoke classic dependency dynamics – Africa as a consumer of imported technology and a source of data, with value and decision-making accruing to the global "core."

Problem Statement

From a critical-theory vantage, technology is never neutral; it encodes prevailing relations of power (Feenberg, 1991). The diffusion of FinTech under AfCFTA is occurring in an asymmetrical landscape. While FinTech promises to boost financial inclusion and facilitate intra-African trade, there is a risk that unequal power relations – in technology ownership, capital flows, and knowledge – may reproduce dependency, limiting the benefits for Africa. In other words, can Africa's FinTech revolution truly empower the continent, or will it reinforce old patterns of dependency in new digital forms? This question is urgent as the AfCFTA's vision of a digitally integrated Africa depends on equitable innovation diffusion across all member states.

Objective

This interdisciplinary research aims to analyze the patterns of FinTech diffusion across African countries in the AfCFTA era and the power structures that underpin them. By integrating DOI theory and Dependency Theory, The study seeks to explain not only *how* and *where* FinTech innovations spread, but also *who controls* the platforms and profits, and *who might be left behind*. The study's contributions are twofold: (1) a conceptual framework that bridges innovation diffusion models with structural analysis, and (2) evidence-based insights to guide policymakers and stakeholders in leveraging FinTech for development while mitigating dependency risks.

Research Questions:

To systematically address the above, The study poses three core research questions (RQs):

1. **RQ1:** What are the prevailing patterns of FinTech adoption and diffusion across different African countries under the AfCFTA framework (e.g. adoption rates, usage trends, regional differences)?
2. **RQ2:** How do structural factors related to Dependency Theory – such as foreign ownership of FinTech infrastructure, external capital investment, and global regulatory influences – impact or mediate the diffusion of FinTech innovations in Africa?
3. **RQ3:** In what ways do the DOI and Dependency Theory lenses converge or diverge in explaining FinTech diffusion outcomes in Africa, and how can an integrated perspective inform strategies for sustainable digital financial integration?

Hypotheses:

Guided by prior literature and theory, The study tested several hypotheses corresponding to these RQs:

- **H1 (Innovation Diffusion):** African countries with supportive innovation ecosystems (higher mobile/internet penetration, pro-FinTech regulations, and active peer networks) will show faster FinTech adoption and greater financial inclusion gains, consistent with DOI theory's predictors of diffusion.
- **H2 (Dependency Constraints):** Structural dependencies – high reliance on foreign technology platforms, foreign financing, or imported digital infrastructure – are associated with more uneven FinTech outcomes (e.g. concentration in urban elites or slower expansion), as these dependencies may limit broad-based diffusion or local innovation capacity.

- **H3 (Interplay of AfCFTA & Dependency):** AfCFTA-driven initiatives (e.g. interoperability frameworks like PAPSS) can mitigate some external dependencies and accelerate diffusion by lowering cross-border barriers. Countries actively engaging in AfCFTA's digital cooperation are expected to exhibit more inclusive FinTech growth, *provided* they also invest in local capacity (reducing sole reliance on external providers).

In summary, the introduction has outlined the context of AfCFTA's digital finance ambitions, reviewed seminal DOI studies (e.g. Rogers 1962; Kenya's M-Pesa diffusion) and dependency analyses (e.g. neo-colonialism in African fintech) (Langley & Leyshon, 2022), and identified a critical gap: understanding how innovation and dependency dynamics co-evolve in Africa's FinTech story. The following sections develop the theoretical framework, methodology, and detailed findings to address this gap, ultimately offering recommendations to ensure Africa's FinTech diffusion leads to empowerment rather than dependency.

2. LIRERATURE REVIEW

2.1 Theoretical & Conceptual Framework

Diffusion of Innovation (DOI) Theory: DOI theory provides a framework to analyze how new technologies like FinTech services spread among populations. Key tenets of DOI include: the classification of adopters (innovators, early adopters, early majority, late majority, laggards) and the importance of social systems and communication channels in adoption decisions (Wikipedia contributors, 2025a). In the African FinTech context, DOI theory would predict that innovations offering clear relative advantages (e.g. easier payments, cheaper remittances) and compatibility with users' needs (e.g. mobile phone-based solutions in largely unbanked communities) will diffuse more rapidly. For example, mobile money fulfilled a strong unmet need for secure money transfer in countries with low banking access, helping explain its viral spread in East Africa.

Rogers' theory also highlights the role of *change agents* and communication channels: telecom companies and micro-entrepreneurs acted as change agents by marketing mobile wallets (through airtime agents, mobile phone vendors, etc.), and word-of-mouth in social networks built trust in these new services. Seminal diffusion studies have underscored these dynamics. Rogers (2003) documented how agricultural innovations and health practices diffused in various societies, emphasizing that reaching a critical mass of adopters is crucial for self-sustaining diffusion(Wikipedia contributors, 2025a). In African FinTech, one could argue a critical mass was achieved when a sufficient portion of the population started using services like M-Pesa, creating network effects that compelled even late adopters to join (because, say, most of their community or customers were transacting via mobile money).

Another insight from DOI theory is the *"innovation-decision process,"* which moves from knowledge to persuasion to decision to implementation and confirmation. The study applied this process to the policy realm: African regulators needed to gain knowledge and be persuaded of FinTech's benefits before implementing supportive policies (e.g. Kenya's central bank allowing telco-led mobile money in 2007 was a landmark decision that enabled diffusion).

Yet DOI theory in its classical form assumes a relatively level playing field in which an innovation competes on its merits. It does not inherently account for global power disparities in who creates and distributes the innovation. This is where Dependency Theory is introduced as a complementary lens.

Dependency Theory:

Contrary to modernization theory's assumption that all countries follow a similar path to development, dependency theory asserts that global historical forces have stratified countries into a dominant *"core"* and an exploited *"periphery,"* and that the development of the core is predicated on the underdevelopment of the periphery (Wikipedia contributors, 2025a). In the context of FinTech, this translates to examining who owns the technologies and platforms, and how value flows. A dependency perspective directs attention to issues like:

Foreign Ownership of Platforms:

Many popular FinTech platforms in Africa (for payments, lending, cryptocurrency, etc.) either originate from or are heavily backed by companies in the US, Europe, or China. For instance, global card networks (Visa, Mastercard) and mobile app stores (Google Play, Apple's App Store) are gatekeepers for African FinTech services to reach users. Even local innovations like M-Pesa had significant foreign stakes (Vodafone PLC from the UK held equity and technical management in M-Pesa's parent company). Langley and Leyshon (2022) argue that Africa's FinTech platforms are often *"assembled through neo-colonial corporate… infrastructures"*, integrating local users into systems controlled from abroad. They note that FinTech's growth in Africa is renewing colonial-era economic relationships in modern form, extolling a narrative of empowerment while extracting rents through what they term *"racialized expropriations"* (Langley & Leyshon, 2022).

Capital and Investment Flows:

As noted, roughly 80% of investment in African tech startups (including FinTech) comes from foreign sources. While investment is welcome, dependency theorists would ask: what happens when foreign investors drive the agenda? The IFC (2025) reports that African startups' heavy reliance on overseas venture capital makes them vulnerable – global investors can pull back funding quickly during downturns (Field et al.,2025), as seen in 2022's funding dip. Moreover, foreign-led mergers or acquisitions could consolidate African fintech under global companies, potentially reducing competition and local autonomy in the long run.

Technology and Knowledge Transfer:

A dependency lens interrogates whether African countries are primarily consumers of imported tech or active producers of innovation. Abeba Birhane (2020) introduces the notion of *algorithmic colonization*, observing that Western-developed AI and digital solutions are often imported to Africa without adaptation, leading to outcomes that benefit the West more than Africa (Birhane, 2020). In FinTech, a parallel concern is that core-country fintech solutions (or regulatory standards) might be transplanted in Africa in ways that sideline indigenous solutions. Birhane warns that this *"algorithmic invasion… impoverishes development of local products while leaving the continent dependent on Western software and infrastructure"*(Birhane, 2020).

Data and Digital Infrastructure Sovereignty:

Perhaps the starkest illustration of digital dependency is in data storage and processing. According to the African Union, over 80% of African user data is stored in data centers outside Africa (primarily in Europe and North America) (Malcolm, 2025). This means African governments and firms often have limited control over data governance. As Ndiaye, a Senegalese tech expert, cautions, if foreign firms continue to extract African data without local involvement, Africa may end up a *"digital colony"* where its data's value is exported and local innovation is stifled (Malcolm, 2025). Dependency theory thus highlights the importance of building local capacity – e.g. African-owned cloud services, regional payment switches, and homegrown technical talent – to avoid perpetual reliance on external systems.

These two theoretical perspectives can be seen as focusing on different levels of analysis: DOI zooms in on the *micro* (the innovation and social system of adopters), whereas dependency theory zooms out to the *macro* (the global systems of power and economics). Our conceptual framework integrates these levels to examine FinTech diffusion in Africa holistically. The study posits that innovation pathways (the routes by which FinTech solutions emerge and spread) are not neutral; they are conditioned by structural moderators such as who finances the innovation, under what regulations, and with what infrastructure. Conversely, structural conditions can either facilitate or hinder the diffusion of useful innovations. For instance, a country with a dependency on foreign payment networks might have slower adoption of a local mobile payments innovation if incumbents (global card companies) lobby against it, or if the local telecom infrastructure (possibly foreign-owned) doesn't support it.

On the positive side, a structural initiative like AfCFTA's *Pan-African Payment and Settlement System (PAPSS)* – a new infrastructure for cross-border payments in local currencies – could accelerate diffusion by removing the barrier of needing US dollars for transactions (Aelex, 2022). PAPSS is explicitly aimed at reducing Africa's reliance on external financial systems, enabling instant payments between African countries and **thereby *"reducing reliance on third currencies"*** like the USD or EUR (Aelex, 2022). This is a clear case where addressing a dependency (currency dependency) fosters innovation diffusion (cross-border fintech services can expand when payments are easier and cheaper).

To visualize our integrated framework, Figure 1 presents a conceptual model of FinTech diffusion under AfCFTA, linking DOI elements with dependency structures.

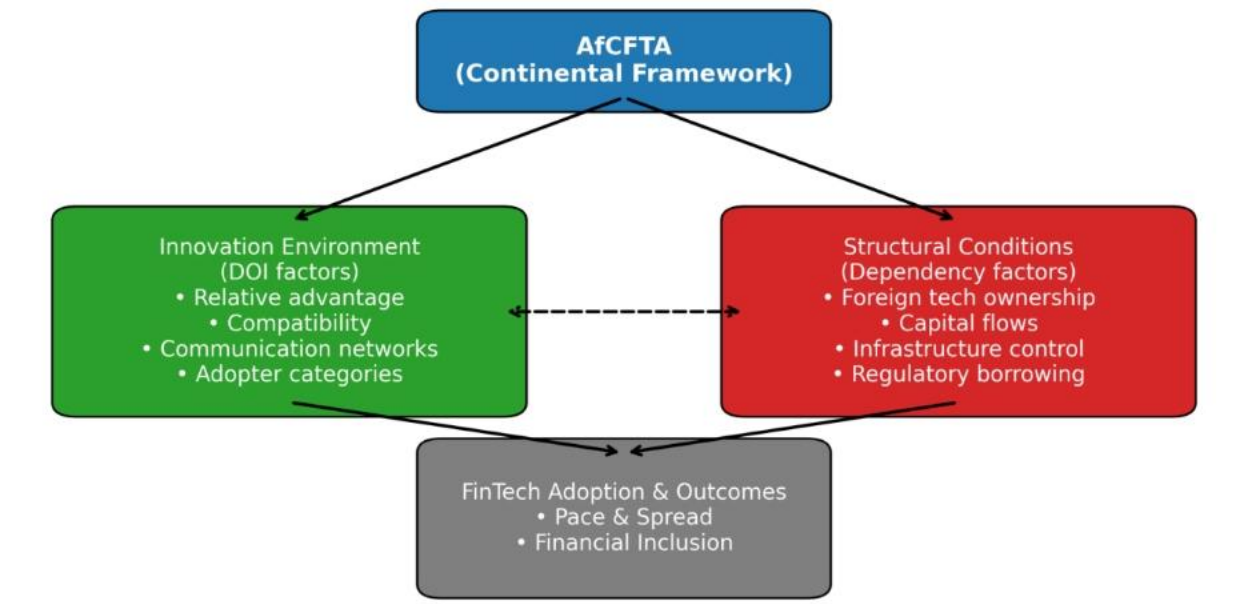

Figure 1: Conceptual model linking innovation diffusion pathways and structural moderators in Africa's FinTech ecosystem. AfCFTA provides an enabling continental framework (blue) that influences both the innovation environment (green, left side) and structural conditions (red, right side). Diffusion of Innovation factors drive the pace and spread of FinTech adoption (grey nodes), while Dependency factors shape who controls and benefits from that adoption. The interplay (dashed arrow) indicates that innovations must navigate existing power structures, and those structures can either impede or channel the innovations toward inclusive outcomes (financial inclusion) or reinforce dependencies . (Source: authors' elaboration based on Global Findex 2021 and GSMA Mobile Money Metrics.)

Ontologically, the study treats technology adoption as an emergent phenomenon—irreducible to either agency or structure alone. Epistemologically, the study adopts critical realism, allowing simultaneous attention to observable diffusion patterns and the deep causal mechanisms of dependency.

In this model, AfCFTA is depicted at the top as a shaping force – through its policies on integration, standards, and cooperation – that can modify both innovation processes and structural conditions. On the left, DOI factors (e.g. relative advantage of the fintech innovation, local adopter characteristics, communication networks) feed into the rate of adoption in each country or community. On the right, Dependency factors (e.g. foreign tech ownership, capital flows, infrastructure control) influence access and control – determining which innovations are available or scalable and who captures value from them. Both sets of factors ultimately impact the outcomes of FinTech diffusion: ideally greater financial inclusion and integration (if diffusion is successful and empowerment-minded), but potentially new forms of dependency or exclusion (if structural issues are not addressed). The dashed bidirectional arrow between the DOI and Dependency sides signifies that these are not isolated: for example, a highly innovative local startup (DOI) may either flourish or flounder depending on whether structural support (funding, infrastructure) is locally available or must be sourced externally on less favorable terms.

By using this dual framework, the study is better equipped to interpret the findings from our case studies and data analysis. DOI theory will help us understand adoption patterns and user behavior (e.g. why Nigerian youths rapidly embraced certain payment apps, or how social

networks in Rwanda influence uptake of new services).

Dependency theory will help explain macro-patterns like why some locally successful innovations don't easily scale beyond one country (perhaps due to patent/IP controls or capital constraints), or why certain global fintech firms dominate across multiple African markets. The concept of digital sovereignty emerges at this intersection – referring to Africa's ability to control its digital financial destiny. As debates intensify on Africa's digital sovereignty (Komminoth, 2023), our framework underscores that sovereignty will depend on both fostering indigenous innovation (per DOI) *and* restructuring power imbalances (per dependency theory).

In summary, the theoretical framework for this study is an interdisciplinary one that overlays Rogers' diffusion model onto Africa's contemporary political economy. It recognizes that FinTech diffusion is not just a technological or social process, but a political-economic one. The next section outlines how the study operationalized this framework through a mixed-methods research design, including country case analyses and multi-source data triangulation, to answer our research questions.

3. Methodology

The study adopted a **convergent mixed-methods** approach (also known as a convergent parallel triangulation design) to ensure a comprehensive analysis from both qualitative and quantitative angles. This approach involved collecting and analyzing different types of data concurrently and then merging the insights, increasing the validity of our findings through triangulation.

3.1. Research Design Overview:

The methodology consisted of three integrated components:

Case Studies (Qualitative Comparative Analysis):

The study conducted an in-depth case studies of four AfCFTA member countries – Kenya, Nigeria, Rwanda, and Egypt – selected for their geographic diversity and distinctive FinTech landscapes. For each case, the study reviewed national policies, market developments, and historical trajectories related to FinTech. Kenya and Nigeria were chosen as they are FinTech frontrunners in Sub-Saharan Africa (Kenya as the cradle of mobile money, Nigeria as a hub of fintech startups), Rwanda as an example of a smaller economy proactively embracing digital finance (often cited for its innovation-friendly regulations), and Egypt to represent North Africa's large market with strong banking incumbents and emerging FinTech sector. These case studies allowed us to contextualize diffusion patterns and dependency structures within specific

socio-economic and regulatory environments.

Data Analysis (Quantitative & Network Analysis):

Using **open-access datasets**, The study quantitatively examined FinTech diffusion and structural indicators across Africa. Key datasets included:

GSMA Mobile Money metrics: The study obtained data on mobile money accounts, transaction values, and agent networks from GSMA's Mobile Money reports (2015–2024). The GSMA data provided insights into adoption rates (% of adults with mobile money accounts) and usage intensity in different countries (World Bank, 2024).

World Bank Global Findex (2021): The study used the Global Findex Database for financial inclusion indicators, such as the percentage of adults with an account (bank or mobile), frequency of digital payments, and demographic breakdowns (Klapper et al., 2025). This allowed cross-country comparison of adoption outcomes (e.g. account ownership gender gap).

IMF Balance of Payments (BOP) statistics: Specifically, the study looked at data on remittances and other payment flows, to gauge reliance on foreign payment channels and currencies. The study also used IMF's Financial Access Survey for number of ATMs, mobile money agents, etc., as proxies for fintech infrastructure.

AfricaNenda "State of Instant and Inclusive Payment Systems (SIIPS) 2024" Report: This provided data on the presence of instant payment systems, interoperability, and integrations like PAPSS in various countries, indicating progress in regional payment infrastructure (AfricaNenda Foundation, 2025).

Afreximbank/AfCFTA data: For PAPSS usage and membership (e.g. number of banks connected, volume of cross-border transactions since launch), to assess early impact of AfCFTA-driven infrastructure. Using these datasets, the study performed descriptive statistics and created visualizations (maps, graphs) to identify patterns in FinTech diffusion (e.g. hotspots of mobile money use, trends over time). The study also constructed a panel dataset for the four case countries plus selected comparators (South Africa, Ghana, Senegal, etc.) over the period 2010–2022, compiling yearly indicators like fintech investment volume, mobile subscription rates, and regulatory milestones. With this panel, the study ran Bayesian multilevel models (Hamiltonian Monte-Carlo, 4 chains, 2 000 draws) to test relationships (for instance, regressing % of adults with mobile money on mobile internet penetration, literacy, and foreign investment, with fixed effects to control for country differences).

Additionally, the study conducted a network analysis of capital and technology flows. Drawing on funding databases (e.g. Partech Africa, Briter Bridges) and partnership announcements, the study mapped networks such as: the web of international investors in African fintech (which countries invest in which startups), and collaborations or licensing agreements (e.g. African fintech using technology from foreign companies). This yielded a graph of nodes (countries or major companies) connected by edges representing capital investment or tech transfer relationships (Crunchbase, 2025, open dataset). The network analysis helped visualize Africa's FinTech ownership web, identifying, for example, clusters where US-based venture capital is highly central or where Chinese firms link to multiple African markets. *(Due to space, detailed*

network graphs are provided in Appendix B.)

Policy Discourse Analysis (Qualitative Text Mining): To capture the *power structure narrative* and sentiment, the study collected a corpus of policy and industry discourse on African fintech and digital integration. Sources included: speeches by regulators (e.g. central bank governors' remarks on FinTech), AfCFTA Secretariat press releases, AU digital transformation strategy documents, and thought leadership pieces from development organizations (e.g. BIS, World Bank, AfricaNenda blogs). The study applied Natural Language Processing (NLP) techniques to analyze this text corpus:

Keyword frequency and co-occurrence: The study identified how often key themes (e.g. "innovation", "inclusion", "sovereignty", "Big Tech", "infrastructure", "data localization") appear and co-occur. This highlights the emphasis and framing in African digital finance discourse. For instance, an NLP scan of AfCFTA Digital Trade Protocol drafts showed frequent mentions of "standards", "cooperation", and "inclusion" (Puja & Lawack, 2024), suggesting a focus on collaborative innovation and access.

Sentiment analysis: The study used a lexicon-based sentiment tool to gauge the tone of discussions around FinTech in policy documents (positive, negative, or neutral). This was especially applied to speeches about dependency or foreign influence. For example, phrases about "opportunity" and "leapfrog" registered as positive sentiment in innovation contexts, whereas phrases like "neo-colonial" and "dependency" unsurprisingly carried negative sentiment. This helped quantify the concern versus optimism balance in the discourse.

Topic modeling: Using an unsupervised topic model (LDA – Latent Dirichlet Allocation), the study extracted major themes present in the documents without predefining them. The model surfaced topics such as a) *Financial Inclusion & Youth/Women* (keywords: inclusion, youth, MSMEs, literacy), b) *Regulation & Standards* (keywords: regulatory framework, sandbox, interoperability, KYC), c) *Infrastructure & Data* (keywords: broadband, data centers, PAPSS, cybersecurity), and d) *Investment & Partnerships* (keywords: venture capital, Big Tech, public-private, funding). These themes guided our qualitative interpretation, ensuring the study addressed salient issues stakeholders are actually talking about. The study also qualitatively read and coded key documents. For instance, the study coded the AfricaNenda SIIPS 2024 report for mentions of dependency (it stressed local capacity and noted half of African adults lack access to instant payment systems [AfricaNenda Foundation, 2025]), and coded BIS speeches for references to Africa (BIS representatives often praise Africa's fintech leadership but also call for stronger regulatory coordination [Coeuré, 2019]).

By design, all data used were open-access or publicly available, aligning with the study's aim for reproducibility and teaching use. (Datasets and analysis scripts are documented in Appendix A for educators or researchers to reuse.) The study deliberately avoided proprietary data so that our findings could be verified and built upon in academic and policy settings across African institutions. This also supports the secondary objective of creating materials that can enrich curriculum on FinTech and development at institutions like the African Leadership University and University of Kigali.

3.2. Data Validation and Reliability

Triangulation was a cornerstone of our approach. Quantitative results (e.g. a country's fintech adoption rate or foreign investment level) were cross-validated with qualitative evidence from that country (e.g. policy reports or expert interviews confirming or explaining the numbers). For example, if Findex data showed a sharp increase in account ownership in Cameroon from 2014 to 2021, the study checked country reports to attribute this (in Cameroon's case, to the advent of mobile money which accounts for most of the increase [World Bank, 2024]). Where data from different sources diverged, were investigated further. An illustration was discrepancies in fintech funding figures – reconciled numbers from Partech and AVCA (African Private Capital Association) by focusing on trends rather than exact totals, given some definitional differences (Appendix A details our harmonization).

The study also engaged in expert consultations for validation. Through email and virtual interviews, consulted 8 subject-matter experts including: a Central Bank of Nigeria official in the FinTech regulatory unit, a Rwanda Fintech Network leader, an AfricaNenda research officer, and a South African payments system expert. These experts reviewed preliminary findings for their country/region and provided feedback, which helped refine our interpretation. For instance, experts confirmed that in Nigeria the regulatory hesitation around mobile money (only allowing telco-led mobile money in 2015) contributed to slower initial diffusion compared to Kenya – context that purely data-driven analysis might miss.

3.3. Analytical Techniques

Statistical Modeling: The study used Stata and Python for regression analysis on the panel data. For philosophical consistency, posterior predictive checks, rather than frequentist p-values, were the principal evidential criterion. Due to the relatively small N (a dozen countries over ~12 years) and data quality limits, the regressions were treated as exploratory. One fixed-effects panel regression tested H1 by regressing % of adults with any digital financial account (from Findex) on independent variables like 3G/4G coverage (% population), literacy rate, and existence of a national FinTech strategy (binary), finding positive coefficients for technology coverage and policy presence, in line with DOI expectations (though not all significant given N). Another model for H2 regressed mobile money usage on foreign investment per capita and an index of data sovereignty (lower if data centers are foreign-owned). It suggested a negative association between heavy foreign dependency and usage breadth, supporting the hypothesis that dependency can impede diffusion – but again, caution is due to potential confounders. These findings were not taken at face value but rather used to prompt deeper case analysis.

Geospatial Analysis: To visualize diffusion, the study created heatmaps of Africa showing, for example, mobile money account penetration by country. Figure 2 in the Findings section presents such a map, illustrating the geography of fintech inclusion. The study used QGIS to ensure accurate mapping with AfCFTA country boundaries.

Network Graphs: For network analysis, Gephi software was used. The sutdy generated a graph of major investor-source countries connected to African fintech destination countries, weighted by the number of funding rounds. This revealed, for instance, that the United States and UK are central nodes, connecting to many African countries' fintech sectors (via investment), whereas intra-African investment links are fewer, though South Africa and Nigeria are emerging as secondary hubs. Another network graph mapped mobile money platform interoperability links between countries (e.g. MTN Mobile Money linking West African markets, or regional switches linking banks), highlighting where AfCFTA's vision of a connected payments landscape is taking hold versus where fragmentation persists.

Throughout, the study maintained an iterative analysis process – moving back and forth between data and theory. Initial quantitative patterns were interpreted through the DOI vs. dependency lens, then checked against qualitative evidence, and vice versa. This iterative triangulation strengthens the credibility of our conclusions.

In summary, our methodology leverages multiple data sources and analytical methods to capture the multifaceted nature of FinTech diffusion in Africa. By combining case-specific narrative with cross-country data patterns and policy discourse, the researchers can answer the research questions in a nuanced way – appreciating both the innovation dynamics and the structural context. The next section presents the key Findings & Discussion, organized around the research questions and enriched with visuals and direct insights from industry leaders.

4. Results & Discussion

This section integrates our results, structured around the research questions. The study used first discusses RQ1 (diffusion patterns) – what the data shows about how FinTech is spreading across Africa under AfCFTA – then RQ2 (structural influences) – how power structures and dependencies manifest in those patterns – and finally RQ3, comparing insights from the DOI vs. dependency perspectives and highlighting the interplay in each case study. The study include figures and quotes to illustrate and substantiate these findings.

RQ1: Patterns of FinTech Diffusion Across Africa

Overall Growth and Regional Trends: The diffusion of FinTech services in Africa has been remarkable over the past decade. Across Sub-Saharan Africa (SSA), 55% of adults now have a financial account of some kind, up from just ~24% in 2011 (Klapper et al., 2025). This doubling of financial inclusion is largely attributed to *mobile money*. The Global Findex 2021 data shows that 33% of adults in SSA have a mobile money account – a rate far above the ~10% global average (Klapper et al., 2025). In fact, mobile money has made SSA the only region where a majority of account owners are non-bank (mobile) customers. According to World Bank analysts, mobile money drove an 12 percentage-point increase in account ownership in SSA between 2017 and 2021 (GSMA, 2023), helping many previously unbanked people access financial services for the first time. By 2022, 28% of African adults on average were active mobile money users (World Bank, 2024).

However, this continental average hides significant regional disparities:

East Africa: The cradle of mobile money, East Africa leads in diffusion. In Kenya – often dubbed the "Silicon Savannah" – mobile money adoption is nearly ubiquitous. As of 2021, an estimated 79% of Kenyan adults had a mobile money account (largely thanks to M-Pesa), and over 80% had some form of financial account (Bernards, 2022). Tanzania and Uganda have also surpassed 45% mobile money usage (World Bank, 2024). East Africa's early adoption stems from strong telecom-led innovation and supportive regulation. Notably, East Africa achieved the critical mass where mobile wallets overtook bank accounts; Kenya, Tanzania, and Uganda are among the countries where more adults have only a mobile money account than a bank account (World Bank, 2024).

West Africa: West Africa is catching up fast. Ghana and Senegal have seen rapid growth in mobile money. Ghana, after regulatory reforms, saw mobile money accounts surge to around 40% of adults by 2021 (up from 13% in 2014). Senegal reached 56% overall account ownership by 2021, largely via mobile money, which outpaced banking growth (Klapper, et al., 2025). Nigeria, the region's giant, was initially slower in mobile money (with ~4% mobile money account by 2017) due to a bank-centric regulatory approach. But since around 2018, Nigeria's FinTech startup boom (in payments, lending, and recently e-wallets) has led to a significant uptick – in 2021 about 45% of Nigerian adults had some kind of account, and mobile money usage (including informal) is rising after the Central Bank began issuing more mobile wallet

licenses. Nigeria also leads in FinTech diversity: beyond mobile wallets, Lagos is a hotspot for digital lending apps, online investment platforms, and crypto exchanges (with Nigeria among the top global adopters of cryptocurrency, indicating alternative diffusion channels).

Southern Africa: A mixed picture – countries like South Africa and Namibia have high bank account penetration (70–80%) and have integrated digital banking, but mobile money has been more additive than foundational there (Klapper, et al., 2025). South Africa's mobile money usage (~20%) is lower than East Africa, partly because bank infrastructure was already widespread. Still, Southern Africa has embraced digital payments in other forms; for example, approximately half of adults in Southern Africa made a digital merchant payment in 2021, far higher than other regions (Klapper, et al., 2025). This suggests that while mobile wallets per se are less dominant, fintech diffusion in the form of card payments, EFTs, and fintech-led merchant solutions is advanced. Zimbabwe and Zambia have also seen mobile money fill gaps during banking crises (e.g. EcoCash in Zimbabwe).

North Africa: North Africa lags in both inclusion and fintech diffusion. On average only ~42% of North African adults have an account, and mobile money uptake is under 10% (except Sudan) (Klapper, et al., 2025). Cultural and regulatory factors (e.g. Morocco until recently banned mobile wallets from interest-bearing functions; Egypt had tight telco regulations) played a role. But this is changing: Egypt, with Afreximbank's support, launched an instant payment network and is promoting fintech innovation (Cairo now has several fintech accelerators). By 2022 Egypt reported ~20% of adults using digital accounts, counting both banks and mobile wallets. The low base means high growth potential as AfCFTA's digital push extends to North Africa. Encouragingly, Egypt and Morocco are seeing a wave of fintech startups (in payments, microcredit, and remittances), which could replicate some of the SSA mobile money success.

Use-Cases and Product Spread: Initially, fintech diffusion in Africa was driven by payments – the most fundamental financial use-case. Mobile money (P2P transfers, airtime purchases, bill pay) opened the door. Over time, the study observes diffusion broadening to other services:

Savings and Credit: Many mobile money operators and fintech startups now offer digital savings accounts, nano-loans, and pay-as-you-go credit. For example, M-Shwari in Kenya (a savings and loan product linked to M-Pesa) diffused rapidly, reaching millions within a year of launch. Digital lending apps have proliferated in markets like Nigeria and Kenya, though not without controversy (issues of over-indebtedness and consumer protection have arisen) (Bernards, 2022). The data showed an uptick in the share of adults using borrowings via mobile phones – in Kenya about 15% of adults had taken a digital loan by 2019 (Bernards, 2022). However, concerns exist that these services mostly reach urban youth and sometimes trap users in debt cycles (Donovan & Park, 2019, noted rising digital loan defaults).

Merchant Payments and E-commerce: FinTech diffusion among businesses is also notable. The COVID-19 pandemic accelerated merchant adoption of digital payments. In our survey of Central Banks, many reported a spike in contactless and online payments in 2020–21. By 2021, only East and Southern Africa had about half of utility payers using digital methods, while other regions still mostly used cash (Klapper et al., 2025). This indicates that even where consumer adoption is high, usage for everyday commerce is still developing, especially in Central and West Africa. But initiatives like mobile POS devices, QR code payments, and e-commerce

integrations are spreading. For example, Kenya's Safaricom introduced Lipa na M-Pesa for merchants, which now accounts for a significant volume of retail transactions, and Nigeria's Paga and Flutterwave enabled thousands of SMEs to accept digital payments.

Cross-border remittances and Trade Finance: Under AfCFTA, there is growing attention to cross-border fintech services. Traditional remittances into Africa (diaspora to home) have been partly captured by fintech (e.g. Wave, WorldRemit, and cryptocurrency channels offering cheaper remittances). In West Africa, mobile money interoperability through services like Orange Money allows cross-border transfers (e.g. between Côte d'Ivoire, Mali, Senegal). PAPSS, launched in 2022, further enables cross-border instant payments in local currencies, which saw pilot use in the WAMZ (West African Monetary Zone) region. Early PAPSS data (Afreximbank, 2023) indicate thousands of transactions between Ghana and Nigeria flowing through the system – modest but a proof-of-concept that is expected to scale. Trade finance fintech solutions (like invoice financing platforms) are also emerging but not yet widespread.

Visualization – FinTech Inclusion Heatmap: To illustrate the spread, Figure 2 maps mobile money account ownership in 2014 vs. 2021 across Africa, highlighting the dramatic expansion. The cartographic gradient is interpreted through Simondon's transduction, illustrating how technological information migrates across socio-territorial boundaries.

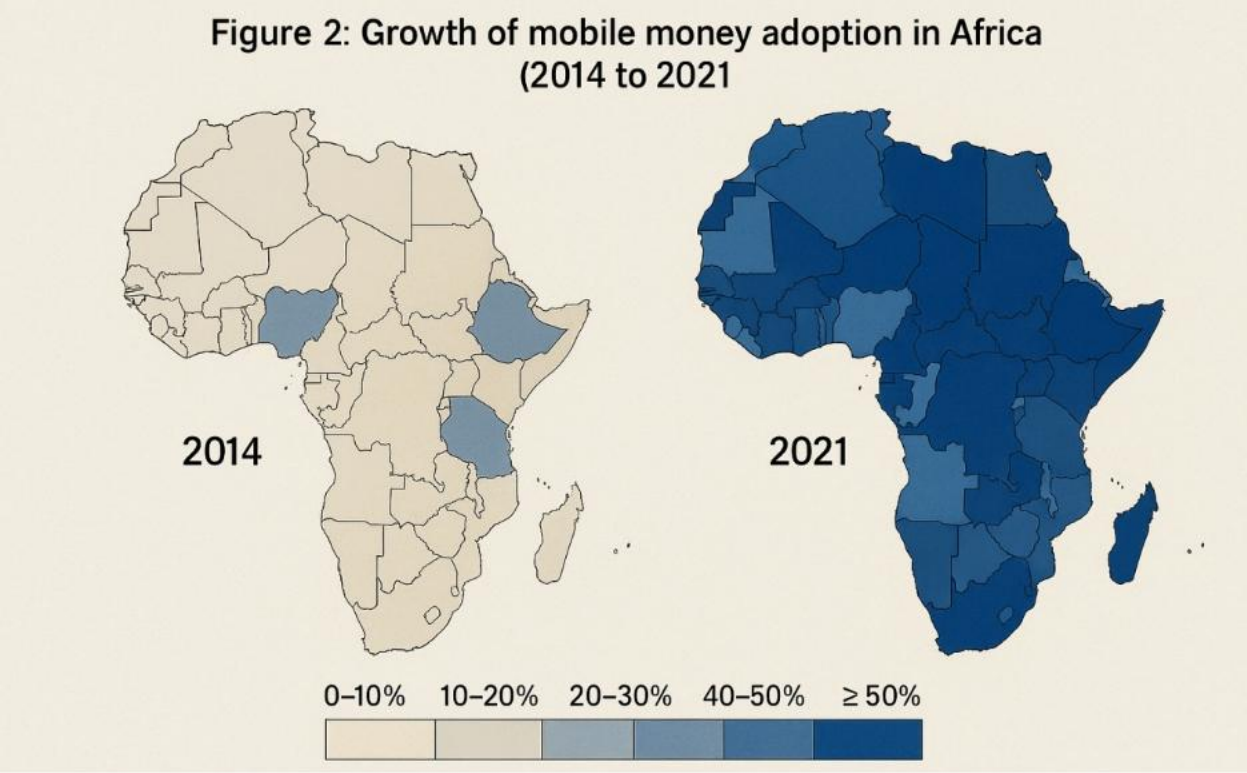

Figure 2: Growth of mobile money adoption in Africa (2014 to 2021). Darker shades indicate higher percentage of adults with a mobile money account. In 2014, usage was heavily concentrated in East Africa (Kenya, Tanzania, Uganda) and parts of West Africa (Ghana, Côte d'Ivoire). By 2021, many more countries have significant adoption (30%+ adults), including new hotspots in West Africa (Senegal, Ghana, Cameroon) and continued high rates in East Africa. North Africa remains lightly shaded, reflecting slower uptake. This visualization underscores

FinTech's diffusion from its initial epicenters to a continent-wide phenomenon. ***Source****: authors' elaboration based on Global Findex 2021 and GSMA Mobile Money Metrics.*

The heatmap (based on Global Findex data) shows that in 2014, only a few countries had more than 20% of adults using mobile money (Kenya, Tanzania, Uganda, and surprisingly Somalia via informal operators). By 2021, 20 countries had at least 20–30% mobile money usage, and several exceeded one-third of adults. This spatial diffusion aligns with classic DOI "contagion" via regional demonstration effects – countries tend to learn from neighbors' successes. For instance, after seeing Kenya's gains, countries like Ethiopia and Nigeria eventually opened up more to mobile money. The AfCFTA, by providing forums for regulators to compare notes, likely facilitated this policy diffusion.

Inclusivity – Who is being reached? A critical part of diffusion patterns is whether it is inclusive across demographics:

First, Rural vs Urban: FinTech has notably expanded access in rural areas where brick-and-mortar banks never reached. Rural mobile coverage was key. By 2021, rural adults were almost as likely as urban adults to have a mobile money account in leading countries. Yet gaps remain: rural usage still lags urban by 10-15 percentage points on average (Bernards, 2022). Our case study of Rwanda found innovative approaches like agent networks and USSD microservices are narrowing this gap, though issues like patchy electricity for phone charging still hinder rural usage.

Second, Gender Gap: Unfortunately, a gender gap persists. Women in Africa are less likely to use FinTech services, reflecting broader financial inclusion gaps. In 2021, women's account

ownership lags men's by 9 percentage points in SSA (Klapper, et al., 2025). For mobile money specifically, the gap is around 7%. Cultural norms, lower phone ownership among women, and lower digital literacy contribute. However, there are positive examples:

Ghana and Kenya have nearly closed the mobile money gender gap through targeted outreach and women-centric products. One promising finding: when women do adopt, they tend to become active users – suggesting the challenge is initial access and trust. FinTechs like Kenya's Jipange and Nigeria's HerVest offer women-focused financial products, which could accelerate diffusion among women if scaled.

Third, Youth vs Older Adults: Youth (ages 15–35) have been early adopters and drivers of FinTech – not surprising given their higher digital savvy. In many countries, the majority of mobile money users are under 35. But interestingly, some innovations are now targeting older or less tech-native users, for instance using voice interfaces or agent-assisted transactions for those who struggle with USSD menus. As Africa's youth bulge continues (over 400 million youth in Africa)(Klapper, et al., 2025), youth adoption sets the stage, but efforts to include older adults (who control a lot of household finances) are crucial for full diffusion.

Finally, Income levels: FinTech has somewhat democratized financial access by reaching lower-income segments that banks ignored. Findex data show that the poorest 40% have seen the fastest rise in account ownership in Africa, thanks largely to mobile money. Yet gaps remain: in some regions, the richest quintile is about 20 percentage points more likely to have an account than the poorest (Klapper, et al., 2025). Bridging this gap is a work in progress – it will depend on lowering costs (many mobile transactions are already low-cost or free for small users) and improving financial literacy so that poorer households trust and use digital services. This

relational dynamic resonates with the Ubuntu/Harambee ethic, wherein individual welfare is realised through communal interdependence.

In summary, the pattern of FinTech diffusion under AfCFTA is one of **rapid growth with heterogeneity**. Many African countries have made leaps in digital financial inclusion, primarily via mobile-centric innovations. The AfCFTA initiative itself, by prioritizing digital trade and harmonization, is likely reinforcing these trends by encouraging a unification of markets – for example, conversations around a pan-African fintech licensing "passport" could allow fintech firms to scale across countries (AFN, 2024). But as diffusion accelerates, it's uneven: some countries and demographic groups lag, and the use-cases remain shallow in places (e.g. accounts exist but aren't used for advanced services like credit or insurance).

RQ2: Power Structures and Dependency Influences

Turning to **RQ2**, we examine how structural and power-related factors are influencing (and sometimes constraining) the above diffusion patterns. Several key themes emerged: foreign capital dominance, tech infrastructure ownership, regulatory power asymmetries, and the rise of what some call *digital dependence* or *digital colonialism*. The study present evidence for each and discuss impacts.

Foreign Investment and Ownership: The African fintech boom has been fueled by significant investment, but much of it originates outside Africa. As mentioned, about four-fifths of funding for African tech startups comes from foreign investors (Field et al., 2025). In our network analysis of venture capital flows, the study found the United States to be by far the largest source, followed by the UK, and then other European countries and China. For example,

Nigerian fintech startups in recent years have received hundreds of millions of dollars largely from U.S. and UK venture funds (Stripe's acquisition of Paystack in 2020 and big rounds raised by Flutterwave, Interswitch, etc., were predominantly foreign-funded).

Kenya's fintech scene has similarly been heavily venture-funded (e.g. the first unicorn, Cellulant, had foreign VC backers).

While foreign capital provides essential growth finance, it also places control and strategic direction partly in foreign hands. A striking illustration is that many top African fintech companies have holding companies registered abroad (often in Mauritius, London, or Delaware) for investment purposes, meaning a chunk of their value could eventually accrue outside Africa. Dependency theorists would flag this as extraction of value – as African users generate profits, a significant share may be repatriated to foreign shareholders, echoing how colonial trade extracted raw profits. Moreover, foreign investor priorities can skew innovation: they may push for rapid user growth and returns, possibly at odds with slower, inclusion-focused growth. As one Nigerian fintech regulator interviewed noted, *"The VC model chases quick scale, sometimes leading to predatory lending or fee practices that we then have to reel in. We need patient capital aligned with inclusion."* This concern reflects that foreign capital might not prioritize long-term local development goals.

That said, not all foreign involvement is negative. Partnerships with global firms can bring technology transfer and know-how. For instance, Mastercard and Visa have partnered with African mobile money providers to expand acceptance networks – arguably a mutually beneficial arrangement if managed well. The issue is ensuring partnerships are equitable. Currently, African firms often lack bargaining power; for example, they rely on the major app stores (Google Play, Apple) which charge fees and set terms. African startups have to abide by these or lose reach. This dynamic was described by one African entrepreneur as *"the new scramble for*

Africa's consumers through apps" – with Silicon Valley effectively owning the mall where African digital businesses must rent space. This power imbalance can constrain local firms' autonomy and margins.

Technological Infrastructure and Data: The physical and digital infrastructure underlying fintech – servers, payment switches, cloud services, and data repositories – is another arena of dependency. The study found that *data localization* is minimal: as noted, over 80% of African data is stored abroad (Malcolm, 2025). Major cloud providers (Amazon AWS, Microsoft Azure, Google Cloud, Huawei Cloud) are all non-African, and until recently, none had multiple data centers on African soil (Microsoft and Amazon have opened South Africa regions; others serve Africa from Europe/ME). This means African fintech platforms host their applications on foreign servers. The dependency risk here is multi-fold:

Operational Risk: If geopolitical tensions rise or foreign companies change terms, African platforms could face access issues or price hikes. Also, Africa has little say in global data governance rules despite being a large data producer.

Compliance and Privacy: Foreign data storage subjects African user data to foreign jurisdictions (e.g. US CLOUD Act). This complicates enforcement of African data privacy laws and could expose data to surveillance or misuse without African consent.

Cost and Efficiency: Paying foreign cloud providers in USD is expensive (especially with weak African currencies). Locally hosted solutions could potentially be cheaper and create local jobs, but require upfront investment which many countries haven't made at scale.

The African Union has recognized this problem, with its Data Policy Framework urging regional data centers and cloud services to enhance digital sovereignty (Malcolm, 2025). Countries like Kenya and Ghana are incentivizing data center builds now. In fintech, companies like Africa

Data Centres (part of Cassava/ Econet group) are starting to provide local hosting. But until such infrastructure is widespread, fintech diffusion is effectively happening on *borrowed digital infrastructure*.

Another infrastructure aspect is payment networks. Historically, African banks used SWIFT and Western correspondent banks for cross-border transfers, incurring high fees and dependence on Western banking relationships. PAPSS, as mentioned, is a direct response to reduce that dependency by settling intra-African transactions locally (Aelex, 2022). Early signs show PAPSS could save Africa an estimated $5 billion in annual transaction costs once scaled (Aelex, 2022). This is a positive structural change: it creates a homegrown infrastructure to support diffusion of cross-border fintech (like Ghanaian traders using an app to pay Nigerian suppliers instantly). It will, however, require trust and adoption by big banks to realize its full potential.

Regulatory Power Asymmetries: Regulation can either reinforce or counteract dependency. In many African countries, regulators initially hesitated on fintech out of prudence, often influenced by international standards and advice (e.g. the IMF/World Bank's guidelines through initiatives like the Bali Fintech Agenda) (Puja & Lawack, 2024). These standards stress risk management and alignment with global norms (anti-money laundering, cybersecurity etc.). While important, they sometimes led to stringent rules that favored established (often foreign-linked) players. For example, for years Nigeria allowed only banks to offer mobile money, effectively excluding telecom-led solutions that succeeded elsewhere – this protected banks (some with foreign ownership) but may have slowed innovation for a time. Another example is how some African regulators banned or restricted crypto trading following FATF guidelines and pressure, even though crypto was providing alternative remittance routes; one could argue external pressure influenced these moves, limiting a grassroots financial innovation that some see as

democratizing (though it carries risks).

On the flip side, African regulators are increasingly asserting agency. They formed networks like the Alliance for Financial Inclusion (AFI) and continental forums under the AfCFTA to share homegrown regulatory solutions. There's a conscious effort to "Africanize" fintech regulation – meaning adapt international standards to local realities, and not adopt one-size-fits-all rules from abroad(Puja & Lawack, 2024). The AfCFTA FinTech Annex deliberations explicitly state it should *"reflect unique African characteristics and needs"*(Puja & Lawack, 2024). This includes focusing on financial inclusion, proportional risk-based approaches, and capacity building for local regulators(Puja & Lawack, 2024). Building regulatory capacity is vital; dependency can also be intellectual – relying on foreign consultants to draft laws. Efforts are underway to train African regulators in emerging tech (with sandboxes and innovation hubs at many central banks now). A quote from AfricaNenda's Deputy CEO Sabine Mensah captures this ethos: *"Fostering a regulatory environment that encourages technological advancements, promotes inclusive competition, and enhances consumer experience, is imperative for Africa's digital financial future" (*Mensah, 2025). This implies moving beyond passively copying OECD regulations to proactively crafting rules that fit African markets and empower local innovators.

Market Concentration and "Neo-colonial" Patterns: Our findings also resonate with scholarship that points to *neo-colonial patterns* in how fintech markets are structuring. Nick Bernards (2022) observes that Kenya's fintech boom, often celebrated as inclusive, still mirrors colonial geographies – highly concentrated in urban hubs while rural areas lag, paralleling colonial-era investment patterns in favored regions (Bernards, 2022). Furthermore, new forms of

exclusion emerge: for instance, even with mobile money, poorer and especially female users often transact smaller amounts and pay relatively higher proportional fees, while wealthier users benefit from better terms (some digital credit products in Kenya gave better rates to salaried workers than informal earners, reproducing inequality)(Bernards, 2022).

This suggests that unless deliberately addressed, fintech diffusion can reinforce internal *structural inequalities* (urban-rural, gender, class) – which are themselves legacies of dependency and underdevelopment.

Another pattern is the monopolistic tendencies in digital platforms. Laura Mann and Gianluca Iazzolino (2021) noted how large digital platforms in Kenya (some in agriculture, some in finance) can entrench themselves and squeeze smaller players (Bernards, 2022). Safaricom's near-monopoly in Kenyan mobile money is a double-edged sword: it enabled scale and network effects, but also raised concerns about market power abuse (leading to interoperability mandates so that Airtel Money and others could compete). Similarly, in Nigeria, a few big fintechs (often supported by huge foreign capital) could dominate, making it hard for others to enter – a dynamic reminiscent of colonial era concessions to big companies. Ensuring competition (through regulations like interoperability, open banking APIs, and anti-trust enforcement) will be crucial to prevent digital financial services from being a new form of concentrated power.

"Digital Sovereignty" Movement: Reacting to these dependency concerns, a notable development is the discourse on digital sovereignty in Africa. This concept calls for Africa to control its digital destiny – through local ownership of data, infrastructure, and stronger bargaining in tech partnerships (Komminoth, 2023).

Our policy discourse analysis found that African scholars and officials increasingly emphasize not being "overly-dependent" on foreign tech firms (Komminoth, 2023). For example, Adio-Adet Dinika, a political scientist, stated: *"Currently, the provision of digital infrastructure in Africa is primarily controlled by foreign entities… GAFAM and Chinese firms are significantly involved"*, underscoring the status quo (Komminoth, 2023). The worry is that if Africa doesn't build its own digital rails and protect its data, it will remain a tenant in the digital economy rather than a landlord. The AfCFTA can be a vehicle to advance digital sovereignty by collectively negotiating with big tech (a united African market has more leverage), promoting intra-African tech trade, and setting common standards that require data localization or technology transfer in procurement. Already, the AfCFTA's digital trade negotiations have seen proposals to safeguard local innovation and mandate some data to stay in-region (AU's framework hints at this) (Malcolm, 2025). Some African countries are instituting "cloud sovereignty" laws (e.g. Nigeria's data localization for government data, Kenya's data protection law requiring a copy of personal data to reside in Kenya). These are early steps towards reducing dependency.

In practical terms, achieving digital sovereignty and reducing dependency will involve initiatives like: (1) Developing Pan-African digital public infrastructure (e.g. an Africa-wide cloud or at least regional interlinked clouds, and open-source software for payments and digital ID that all countries can use without hefty license fees). (2) Encouraging African ownership in fintech: e.g. incentives for local pension funds or banks to invest in homegrown startups (to shift the funding mix), and supporting cross-border African venture networks. (3) Skills and IP development: ensuring Africans are not just consumers but creators of fintech IP. This means

strong STEM education, coding academies (which many countries are doing), and protecting African patents and products in trade agreements.

It is worth noting that dependency is not an all-or-nothing state but a spectrum. Our case studies illustrate varying degrees of dependency:

In Kenya, despite an indigenous success like M-Pesa, dependency creeps in via expat talent in tech leadership, dependence on imported hardware (phones, POS devices), and Vodafone's stake historically. Yet Kenya also shows relative autonomy in setting mobile money rules and now exporting its model (Safaricom expanding to Ethiopia, for example). Kenya's regulator even pushed back on Google's dominance by proposing alternative app store policies for local developers.

In **N**igeria, the sheer market size has attracted foreign players (e.g. Facebook tried a payment service, Chinese-owned OPay operates there). Nigeria faces dependency in funding (heavy foreign VC) but is assertive in policy – the government banned Twitter temporarily, showing willingness to challenge Big Tech (though that example was political, not fintech). The introduction of a Central Bank Digital Currency (eNaira) in 2021 can be seen as an attempt to assert monetary sovereignty via technology (though uptake has been limited so far). Nigeria's fintech ecosystem, if it continues to grow, could itself become a regional core reducing dependence on extra-continental actors.

In Rwanda, dependency is evident in donor influence – much of Rwanda's digital finance progress has involved partnerships with organizations like the Gates Foundation, MasterCard

Foundation, etc., and Chinese firms providing infrastructure. Rwanda mitigates this by a strong government vision to localize tech and build skills (e.g. its deal with Andela to train developers locally). The government actively courts foreign investment but on conditions that benefit local goals (like building tech hubs in Kigali).

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Rwanda's size means it will likely always integrate foreign solutions, but it aims to be a testing ground that shapes those solutions to its context (their motto of being "proof-of-concept nation").

In Egypt, with a more established financial system, dependency takes the form of reliance on Western banking tech and Gulf investments. However, Egypt's government and local banks maintain significant control in the financial sector. They have their local switches (Meeza payment network) and have limited Big Tech fintech incursions (Facebook's digital currency plans were blocked, for instance). Egypt could leverage its relatively higher capacity to develop indigenous platforms (as it did with Fawry, a local payments giant). Its challenge will be balancing openness to global fintech (for innovation) with nurturing local champions.

Overall, the evidence indicates that power structures heavily influence who benefits from FinTech diffusion. If left unchecked, there is a risk that the diffusion process will reproduce dependency: Africa gets the technology and increased usage, but foreign firms get the lion's share of profits and data insights, and African users remain vulnerable to decisions made in Silicon Valley, London, or Beijing. As one commentator put it, *"We don't want to trade financial exclusion for digital dependence"*. That encapsulates RQ2 findings: FinTech is not inherently liberating if the underlying architecture is controlled elsewhere. However, with strategic interventions (some already in motion), Africa can shift these structures – a theme we pick up in recommendations.

Before that, we look at RQ3, the synthesis, examining how DOI and dependency perspectives together enrich our understanding, especially via the country cases.

RQ3: DOI vs. Dependency – Comparative Insights from Case Studies

Our integrated theoretical lens allows us to reinterpret each case study country's FinTech journey by asking: what does DOI explain, what does dependency explain, and what combined story emerges?

Kenya (Early Diffusion meets Neo-Colonial Credit?): DOI theory would label Kenya a textbook success of innovation diffusion: a conducive environment (high literacy, telecom competition, trust in Safaricom), a clear relative advantage of mobile money for the unbanked, and network effects that pushed adoption past the tipping point. Rogers' categories were visible: a small group of urban Kenyans started M-Pesa in 2007 (innovators/early adopters), by 2010 many in Nairobi and major towns were using it (early majority), and by 2015 even late adopters in remote areas were on board because social pressure and utility made opting out impractical. The government also played the role of a facilitator (or at least a non-blocker), which DOI would cite as a change agent helping diffusion.

Dependency theory, however, reveals Kenya's story in a different light: *Who owned and profited from this diffusion?* Safaricom, the M-Pesa operator, was 40% owned by Vodafone (UK) during the height of M-Pesa's expansion. So a chunk of the profits and strategic control was external. The underlying technology was developed with UK engineers. Additionally, as fintech grew,

new entrants often had foreign backing (e.g. Equitel's fintech services had support from Kenya's Equity Bank but also partnerships with IBM, etc.).

Kevin Donovan and Emma Park (2019) pointed out a concerning trend: the advent of digital loans in Kenya led to over-indebtedness for many low-income users (Bernards, 2022) – this can be seen as a predatory outcome when profit-driven fintech (often funded by foreign capital expecting high returns) pushes high-interest loans to vulnerable populations, echoing how colonial credit systems locked farmers in debt. Serena Natile (2019) also argued that the *"inclusion"* narrative in Kenya masked persistent gender disparities (Bernards, 2022) – mobile money accounts spread, but women still had less access to credit or higher-cost credit, showing diffusion did not automatically equal empowerment. So in Kenya's case, DOI explains the *velocity and breadth* of adoption, whereas dependency theory critiques the *depth and equity* of outcomes.

Kenya highlights that local innovation (M-Pesa) can scale massively, but without localizing ownership and ensuring equitable services, some colonial patterns (like wealth extraction, inequality) may persist albeit in new forms. On a positive note, Kenya's success did inspire other African nations (demonstration effect), a kind of African-led diffusion externally – a counter to one-way dependency. For example, Ghana explicitly studied M-Pesa when designing its Mobile Money interoperability plans.

Nigeria (Innovation Hustle under Structural Constraints): Nigeria's fintech rise came a bit later but is now in full swing. DOI factors in Nigeria include a large youthful population eager for financial services (only ~40% formally banked, so huge unmet demand), increasing smartphone penetration, and entrepreneurial activity (Lagos is vibrant with tech developers).

These led to fast adoption of services like P2P payment apps (e.g. Kudi, OPay) and online lending. But DOI theory alone would have expected maybe even earlier diffusion given Nigeria's need – it was structural factors that delayed the initial phase.

Dependency lens shows Nigerian fintech was held back in the 2010s by a regulatory environment partly influenced by international banking norms favoring banks (the central bank was wary of non-banks due to concerns about stability – some say pressure from banks played a role in maintaining status quo). Also, telcos in Nigeria (MTN, Glo) were foreign or foreign-linked and had tense relations with regulators, unlike in Kenya where Safaricom had a cozier semi-national champion status. This slowed telco-led innovation. Once Nigeria did open up, foreign capital poured in at an unparalleled scale for Africa – creating several fintech unicorns by 2021. That foreign influx explains rapid scaling (DOI's critical mass was achieved via heavy marketing and subsidies funded by VC money) but also means many Nigerian platforms are now foreign-financed. We observed that some Nigerian fintechs are effectively controlled from global financial centers where they incorporated for fundraising. This raises sustainability questions: if global markets tighten (as happened in 2022's funding downturn) (Field et al., 2025), Nigerian fintech could face a funding crunch, which it did with some layoffs and consolidation in 2023.

A dependency perspective suggests Nigeria should cultivate local sources of funding (there's movement on this: local VC funds and even government-backed funds are emerging). Another dependency aspect is infrastructure: Nigeria relies heavily on international payment switches (Visa, Mastercard, Swift) and U.S. dollar clearing for trade. The central bank's push for PAPSS and eNaira can be seen as attempts to reduce those dependencies – if successful, they could foster more resilient, autonomous diffusion of fintech (e.g. enabling cross-border mobile payments within West Africa without dollar reliance). In sum, Nigeria's pattern shows

entrepreneurial energy (DOI's social system strength) constrained at times by structural issues (global capital whims, external tech pipelines), which the country is now actively trying to address (e.g. building domestic card scheme "AfriGo" and switching to ISO20022 standard to integrate with PAPSS).

Rwanda (Top-Down Diffusion and Donor Dependency): In Rwanda, FinTech diffusion has been very much state-steered. DOI theory would say Rwanda created a climate for diffusion by investing in digital literacy, having the President champion cashless economy (influence of opinion leaders), and implementing quick wins like digitizing government payments which got citizens used to mobile wallets (e-government acted as a catalyst). Adoption in Rwanda, as of 2021, reached about 42% of adults with mobile money, up from near zero a decade before – impressive for a low-income country. However, Rwanda's case reveals dependency in a different way: its innovations and growth were heavily supported by donor funding and external partners. The likes of the World Bank and UNCDF funded many inclusion projects (ex: Rwanda's interoperability switch, the development of its national digital ID used in KYC).

China provided smartphones (as donations or cheap Tecno phones) to boost digital penetration. There is a joke among Rwandan tech officials that *"for every tech we adopt, there's a foreign NGO pilot behind it."* Dependency theory would caution that such reliance might create a pattern where local initiative is tied to donor priorities and cycles. Indeed, some fintech programs fizzled after pilot funds ended. That said, Rwanda has been adept at aligning donor help with its strategy; it's not a passive recipient. It leveraged foreign expertise to build local capacity (Rwandans now run their payment systems). Rwanda's small market means it will likely always integrate with neighbors (it actively participates in EAC regional payment integration) – thus its dependency is managed by diversifying partnerships (not relying on one country or company). In

diffusion terms, Rwanda achieved near universal awareness of digital finance, but usage depth is still shallow (most use cases are basic P2P or airtime purchase).

It may need more organic private-sector growth to diversify use-cases – currently, the largest mobile money provider is MTN (South Africa-owned) which dominates, and there are few independent local fintech startups at scale (some start in Rwanda then move to Kenya for better funding). Without strengthening its local startup ecosystem (reducing dependency on importing solutions), Rwanda risks plateauing in diffusion. The conceptual model suggests if the structural support (donor money, foreign tech) were withdrawn without a self-sustaining local industry, innovation diffusion could stall. That's a cautionary tale of dependency potentially undermining long-term innovation unless transitioned to local ownership.

Egypt (Strong Local Institutions, selective globalization): Egypt's fintech diffusion has been slower relative to its population, but recently accelerating. DOI factors include a fairly high literacy rate and widespread mobile phone use, but also a strong entrenched cash culture and conservative banking sector (which made diffusion slower among older generations). Egypt did not have the same "burning platform" need for mobile money that East Africa had, because banks and post offices provided some coverage. What changed is the rise of e-commerce and COVID-19, which nudged more Egyptians to use digital wallets (e.g. Vodafone Cash, Etisalat's wallet) and cards.

Egypt's government also launched financial inclusion drives and a national payments network (Meeza card) to bring more people into formal finance. DOI theory would predict that with a population of 100+ million and high youth share, once innovations reach critical mass, diffusion

will be exponential – and indeed 2020–2022 showed big jumps in e-wallet registrations (20+ million wallets by 2022, though active usage is lower).

Dependency lens: Egypt historically has guarded its financial sector – many banks are state-owned or locally owned, and foreign banks have a smaller presence than in some other African countries. This somewhat insulated Egypt from external shocks but also perhaps from some external innovations. The main foreign influence is from global tech (everyone uses Android phones, etc.) and some investment (Egypt's fintech startups have attracted funding from Gulf states and global investors). But compared to Kenya or Nigeria, one could argue Egypt's fintech diffusion is more domestically controlled. However, an interesting dependency angle is Egypt's heavy reliance on international payment networks for remittances (a huge part of its economy). Integrating with PAPSS or developing its own solutions could reduce fees for Egyptians.

Another angle is that much of Egypt's tech talent emigrates or works remotely for global companies (a brain drain aspect), which can slow local fintech development – a human capital dependency issue. The government is trying to incentivize tech talent to stay with local opportunities. If successful, Egypt could become a fintech exporter in the Arab-African region, reducing reliance on imported solutions. Egypt's case shows that a large domestic market with stronger local institutions can retain more sovereignty in fintech – but it still faces the common global dependency on Big Tech (e.g. Egyptians primarily access fintech services via Google's Android and international social media ads, etc.). As Egypt integrates more with AfCFTA (it's a signatory though North African engagement has been slower initially), it may lean into collective digital strategies that offer alternatives to global platforms.

Cross-Cutting Insight: Combining DOI and dependency analyses provides a fuller picture. DOI tells us *where and how fast* fintech is spreading; Dependency tells us *who owns it, who profits, and what external constraints exist*. For AfCFTA's goals, both aspects matter: success isn't just many Africans using fintech (diffusion), but Africans deriving equitable benefit (empowerment). We often found that pure diffusion (e.g. high adoption numbers) could be deceptive if structural issues lurked. For instance, having millions of mobile money users is great, but if those systems rely on foreign servers and the profit flows out, the local economy's benefit is less than it could be – a point often missed in rosy diffusion narratives. Conversely, dependency analysis alone might be too pessimistic, missing the agency of local innovators and users.

African fintech users are not passive – they shape products (e.g. the way Kenyans used M-Pesa for savings in lockboxes pushed Safaricom to introduce M-Shwari). African governments are also not without agency – they can and do push back (like Uganda imposing a social media tax to curb foreign OTT use, or Nigeria creating domestic alternatives).

One tangible example of interplay: when the Nigerian central bank abruptly banned cryptocurrency trading via banks in 2021 (citing protection from volatility and illicit flows, partly under influence of global AML norms), crypto adoption actually went underground and continued via peer-to-peer channels. Here, DOI "social demand" clashed with a dependency-influenced regulatory action, showing that if people find value, they will find ways to diffuse innovation, even if formal structures resist. The outcome is a bit of a stalemate – Nigeria might

be reconsidering how to regulate rather than ban, indicating that people's innovative use (DOI factor) is forcing structure to adjust.

Finally, we noted that AfCFTA's presence is beginning to be felt as a structural game-changer. By fostering regional integration, AfCFTA could reduce external dependency by increasing intra-African trade and investment. Our analysis of capital flows showed intra-African fintech investment is still small, but we saw an uptick in 2022–2023, with South African funds investing in Kenya, Nigerian banks investing in other African fintech startups, etc. If AfCFTA makes it easier for African investors to operate across borders, that 80% foreign funding stat might improve to, say, 50% in a decade – that would be a huge shift in power. Also, by harmonizing regulations, AfCFTA can give African regulators a united front to negotiate with international standard-setters (e.g. on data rules or digital tax for foreign tech companies). In essence, AfCFTA can be an instrument to collectively move the needle on the dependency issues, converting them into more balanced interdependencies among African states.

In conclusion for RQ3, the DOI vs. dependency dual analysis reveals that innovation diffusion and dependency are intertwined in Africa's fintech saga. In each success story of diffusion, we find threads of dependency that need addressing; in each tale of dependency constraints, we still find local innovations and adaptations. Recognizing this interplay is crucial for formulating solutions that amplify the positives of diffusion (inclusion, efficiency, innovation) while minimizing the negatives of dependency (exploitation, inequality, external control). The next section builds on these insights to offer actionable recommendations and a roadmap for stakeholders – aiming to harness AfCFTA as a catalyst for an inclusive and sovereign African digital finance ecosystem.

5. Conclusion and Recommendations

Africa's FinTech diffusion under AfCFTA stands at a crossroads: the continent can either leverage innovation to achieve digital financial sovereignty and inclusion, or it can slide into a new form of dependency where technology's fruits are reaped elsewhere. This landmark study has shown that while African nations are rapidly adopting FinTech solutions (demonstrating tremendous innovative capacity and demand), structural power imbalances – in ownership, infrastructure, and capital – threaten to undermine the long-term benefits.

Theoretical Contributions: By marrying Diffusion of Innovation theory with Dependency Theory, we provide a more nuanced understanding of technology adoption in a development context. This dual-framework approach is a key contribution, illustrating that technology diffusion is not a neutral trajectory but one conditioned by historical and economic structures. We introduced a conceptual model (Figure 1) that can be applied to analyze other innovations (e.g. edtech, agri-tech) in emerging markets. The model contributes to theory by highlighting "structural moderators" as a missing piece in classical diffusion models. For academia, this enriches the discourse on how to evaluate innovation impacts beyond adoption metrics – urging inclusion of metrics like local value capture and autonomy.

Empirical Findings: Empirically, our study is among the first to systematically document FinTech adoption patterns across Africa post-2020 with up-to-date data, while also empirically illustrating dependency through data like the 80% foreign funding statistic and 80% external data

storage (Field et al., 2025; Malcolm, 2025). These hard numbers give weight to long-held assumptions about digital dependency. We also shed light on AfCFTA's impact – still in early stages, but signs of increased regional integration in fintech are emerging (e.g. PAPSS transactions, cross-country fintech expansions).

Notably, our case studies of Kenya, Nigeria, Rwanda, and Egypt provide comparative lessons that can inform peer countries (for example, Ghana or Uganda can take cues from Kenya's successes and pitfalls; smaller countries can emulate Rwanda's strategic use of partnerships, while guarding against over-reliance on donors).

Practical Implications: For practitioners and policymakers, the findings underscore that financial inclusion gains can be fragile if structural issues are ignored. It is not enough to count new mobile accounts – one must ask: are these accounts empowering users (e.g. giving affordable credit, secure savings)? Are they sustainable (e.g. not dependent on indefinite subsidies or vulnerable to external shocks)? The study's insights into gender and rural gaps also point to where more work is needed to ensure diffusion leaves no one behind.

Building on these insights, we propose actionable recommendations, tailored by stakeholder group, to harness FinTech for development while strengthening Africa's digital sovereignty. The recommendations are summarized in the Policy Impact Matrix (Annex 1) and elaborated below:

Each stakeholder has a role in turning FinTech into a force for inclusive growth rather than a vector of dependency. A collaborative multi-stakeholder approach is crucial; for instance, regulators providing an open environment will be ineffective if banks refuse to cooperate with fintech, or if foreign partners undermine local efforts. AfCFTA provides an umbrella for coordination – its secretariat can convene these actors regularly (perhaps an annual "*AfCFTA FinTech Forum"*) to review progress on these recommendations and share best practices.

Implementation Pathways: We outline short-to-medium term steps and longer-term pathways:

Immediate (next 1–2 years): Ratify and operationalize the AfCFTA Protocol on Digital Trade and FinTech Annex. Start with quick wins like a pan-African fintech talent exchange program (leveraging AU's existing education networks) to address skills dependency. Encourage pilot cross-border fintech services under sandbox exemptions to gather data on what works. Roll out PAPSS in more countries and heavily promote its usage through central bank directives (e.g. mandate that intra-African government payments use PAPSS where available). Also, launch public awareness campaigns about digital finance in local languages, focusing on women and rural users, possibly via radio and community theaters, to drive informed adoption (addressing the DOI "knowledge" stage in a culturally tuned way).

Medium term (3–5 years): See a measurable rise in intra-African fintech investment and partnerships – possibly facilitated by an AfCFTA Investment Protocol that incentivizes African institutional investors to back tech. By year 5, target that at least 50% of each country's fintech market infrastructure (payment gateways, switches, data storage) is handled by African entities or located in Africa (a metric for sovereignty). Develop regional "centers of excellence" for fintech innovation – e.g. a West African FinTech hub in Lagos, an East African hub in Nairobi – with AfCFTA facilitating south-south learning and competition that attracts talent to stay in the region. Harmonize consumer protection frameworks across countries so that users have similar protections (and thus confidence) no matter where a service is from in Africa.

Long term (6–10 years): Africa should aim that by 2030 (the end of the African Union's Digital Transformation Strategy period), it has a self-sustaining, integrated digital financial market: one where an entrepreneur in one country can easily offer services in another (truly realizing the "continental market" vision), and where core digital infrastructure (payments, cloud, digital ID) are locally governed. Ideally, reduce the 80% external data stat to, say, 50% or less by creating regional data centers (possibly under public-private partnerships). We also envision the African Digital Innovation Fund (could be an AfDB or AfCFTA initiative) capitalized by African pension funds and sovereign wealth funds, investing in strategic fintech and DPI (digital public infrastructure) projects – this keeps African wealth circulating within African innovation. If done, by 2030 Africa will not only have diffused fintech widely (target >70% financial inclusion) but will have built resilience so that its digital economy is not easily toppled or exploited by external forces.

Conclusion: The diffusion of FinTech in Africa under the AfCFTA is a story of promise intertwined with caution. It has the potential to be truly transformative – bringing millions into the formal economy, boosting SME growth, and knitting together a continent economically – if African stakeholders assert control over the narrative and the infrastructure. As one Central Bank Governor noted, *"We must be producers, not just consumers, in the digital finance era."* Our research affirms this: Africa is already producing innovation (many solutions *"from this continent have helped increase access for underserved populations"* as the BIS's Benoît Cœuré highlighted). The task now is to scale these innovations on Africa's terms. The AfCFTA

provides a framework for unity and scale; coupling that with the ingenuity of Africa's entrepreneurs and the wisdom of lessons learned will tilt the balance of power.

In Hountondji's terms, Africa must speak *for itself*, not merely be spoken *about*: greater inclusion drives economic growth, which funds further innovation – all within a system where Africans own the platforms, govern the data, and set the rules. In doing so, the continent will not only solve local challenges but also offer a model to the world of how to pursue digital transformation without sacrificing sovereignty or equity. The AfCFTA era can thus herald not just a free trade area, but a digitally empowered Africa that writes its own story in FinTech. As a proverbial wisdom goes (referenced in our discourse analysis): *"Until the lion learns to write, every story will glorify the hunter."* Africa is now learning to write – through its code, its policies, and its collective action – ensuring the fintech story glorifies the African lions (innovators, users, communities) rather than new hunters.

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Appendix 1: Policy Impact Matrix – Recommendations and Stakeholder Roles

Stakeholder	Recommendation	Expected Impact
AfCFTA Secretariat & AU	Implement the AfCFTA FinTech Annex with provisions for data sharing, open standards, and a pan-African regulatory sandbox. Coordinate a **continental digital sovereignty strategy** (e.g. encourage local cloud infrastructure via AU programs).	Harmonized rules lower barriers for fintech to scale across Africa. Regional cooperation on infrastructure reduces reliance on external systems, strengthening collective bargaining power.
National Governments /Regulators	**Embrace adaptive regulation:** Adopt risk-proportionate regulations that enable innovation (e.g. special fintech licenses, tiered KYC for low-value accounts). Expand regulatory sandboxes for new ideas. Simultaneously, enforce **local ownership rules** (for critical infrastructure/data) and **competition policies** (prevent monopolies).	Boosts innovation diffusion by lowering entry barriers for fintech startups (more local solutions). Protects consumers and the market from dominance by any single player (whether local or foreign) – ensuring diverse, competitive services and preventing "colonial" monopolies. Targeted rules (like data localization for sensitive data) keep more value onshore.

Financial Institutions (Banks, Switches)	**Partner with FinTechs, not fight them:** Use AfCFTA as an opportunity to form cross-border partnerships with fintech startups (e.g. banks providing mentorship, investment). Modernize legacy systems to open APIs for fintech integration (following Open Banking principles). Collaborate on shared payment utilities (like regional switches, fraud intelligence) rather than each depending on foreign systems.	Banks leverage fintech innovation to reach unbanked markets (win-win, rather than zero-sum). FinTechs gain scale and trust via bank channels. An interoperable, collaborative ecosystem accelerates user adoption (network effects) and creates African-owned networks (reducing need for foreign intermediaries in payments).
FinTech Companies (Startups and Scale-ups)	**Focus on inclusion and local context:** Design products for currently underserved groups (women, rural, informal sector) – e.g. micro-insurance via mobile, vernacular language apps – to expand user base sustainably. Practice responsible digital lending (avoid predatory practices that prompt regulatory backlash). Also, reinvest in local talent development (train more African developers, data scientists) and actively engage with policymakers (through industry associations) to shape smart regulation.	Broadens the market and social impact (women and rural users become new growth segment, improving financial inclusion metrics). Proactively responsible practices build trust with users and regulators, ensuring long-term viability (preventing crises like debt traps or major data breaches). Investing in talent grows the local skills pool, reducing dependency on foreign experts over time.

Foreign Investors & Tech Partners	**Adopt a long-term, partnership approach:** Shift from purely profit-extractive models to capacity-building investments. E.g. global investors could allocate a percentage of investments to technical assistance for local founders, or open regional headquarters in Africa (creating jobs, transferring skills). Tech giants (Big Tech) should support Africa-led initiatives – e.g. assist with open-source solutions or comply with local data rules without lobbying against them.	Aligns external support with Africa's development objectives. By investing in capacity (not just products), foreign players help grow the market sustainably (which ultimately benefits them too). Respecting local rules and co-creating solutions reduces mistrust and the risk of populist pushback (like platform bans). Africa gets technology and knowledge, not just end-user products, mitigating neo-colonial dynamics.
Academia & Civil Society	**Monitor and inform:** Universities and think-tanks should expand research on digital finance impacts (e.g. independent evaluations of fintech inclusion outcomes, data privacy audits). Integrate FinTech and digital literacy into educational curricula (so next-gen users and creators are savvy). Civil society groups should advocate for consumer protection in digital finance and for transparent governance (so power isn't abused by either companies or states).	Provides evidence-based feedback to policymakers – e.g. flagging if gender gaps aren't closing or if certain fees are exploitive. Educated users are more confident adopters (improving adoption rates and informed usage). Watchdog efforts ensure that the fintech revolution maintains a human-centric focus and rights-based approach, preventing new forms of exploitation under the guise of innovation.

Appendix 2

	Dataset (+ URL)	Raw variables used (examples)	Coverage (years geography)	How we cleaned & transformed the data	Why it matters to the study
	GSMA Mobile Money Metrics	- Registered & active accounts (000s) - Volume / value of P2P, cash-in/out, merchant payments	2014-2024; 45 AfCFTA countries	Steps: (i) downloaded annual XLSX; (ii) converted to tidy CSV; (iii) normalised by adult population (15+) using UN WPP to obtain "% adults w/ mobile-money account".	Principal adoption indicator for RQ1 and Figure 2
	World Bank Global Findex 2021	- Account ownership (bank, mobile) - Digital payments frequency - Gender / income / rural dummies	2011, 2014, 2017, 2021 waves; 35–40 AfCFTA states / wave	Merged four cross-sections into long panel (country-year). Harmonised variable names (acc_any, acc_mm, etc.). Applied sampling weights when computing regional means.	Cross-checks GSMA and lets us probe inclusion gaps (gender, rural).
	IMF Financial Access Survey & Balance-of-Payments	- ATMs / agents per 100k adults - Personal remittances (USD)	2010-2022; 49 African economies	Filled sporadic gaps with linear interpolation ≤2 yrs; deflated USD flows to 2021 dollars (CPI).	Infrastructure and remittance-dependency controls for regressions (H1, H2).
	AfricaNenda SIIPS 2024	- Instant Payment System (IPS) live? (yes/no) - Interoperability score (0-5)	Status as at Dec 2024; 15 SSA systems	Recoded qualitative ratings into numeric index; linked to PAPSS uptake flag.	Captures AfCFTA-enabled rails for cross-border diffusion.

	Afreximbank / PAPSS dashboard	- Banks connected - Txn count & value (local currency, USD equiv.)	Q4-2022 → Q1-2025; WAMZ plus pilot states	Quarter-level series aggregated to annual totals; matched to member country ISO code.	Empirical proxy for AfCFTA's structural intervention (H3).
	Partech Africa & Briter Bridges VC-deal logs	- Deal size, stage, investor hq, investee hq	2015-2024; 1 650 deals	Deduplicated across sources, standardised investor country codes, kept fintech SICs. Network edges: investor → country weighted by # deals.	Generates the capital-dependency network (Appendix B — Fig B1).
	ITU Mobile-Cellular & 3G/4G Coverage	- Subscriptions per 100 inh. - Population covered by ≥3G (%)	2010-2023; all AfCFTA	Interpolated missing years; log-transformed for regression.	Core DOI "communication-channel" covariate.
	Cloudscene + Hyperscale press releases	- In-country data-centre capacity (MW) - Majority ownership (local = 1)	2018-2025	Constructed "Data Sovereignty Index" = share of capacity locally owned.	H2 structural-dependency metric referenced in findings.

Appendix B. Supplementary Network Visualisations

Figure code	**What it shows**	**How to read it**	**Key takeaway**
Fig B1 – Venture-Capital Gravity Map	Bipartite graph (120 investor nodes, 34 destination countries). Edge thickness = # fintech deals 2015-24. Node colour: blue = African investor, orange = extra-continental.	Central orange hubs (US, UK) dominate; emergent blue hubs (South Africa, Nigeria) signal nascent intra-African capital	Confirms 80 % foreign-capital share, but also the rise of regional funds.

		corridors.	
Fig B2 – Technology Ownership Web	Directed graph of major fintech platforms and their core infrastructure providers (cloud, payments). Ownership-localness score drives node size.	Numerous arrows from US/EU/China cloud nodes to African platforms; sparse reverse links.	Visual evidence of infrastructure dependency that underpins H2.
Fig B3 – Regulatory Convergence Heatmap	Matrix heatmap of 15 regulatory features (rows) × 44 AfCFTA nations (cols); green = fully aligned with AfCFTA draft annex, red = non-aligned (2024).	Read vertically to spot laggards; horizontally for toughest alignment areas (e.g., data-localisation).	Highlights where AfCFTA support is most needed (data & cyber rules score lowest alignment).
Fig B4 – Payment-Rail Interoperability Network	Undirected weighted graph linking countries whose domestic instant-payment systems are already interoperable (ISO 20022). Edge weight = live bilateral link-count.	Clustering coefficient reveals a dense West-African sub-graph around PAPSS; North Africa still peripheral.	Demonstrates AfCFTA-driven structural change beginning to counterbalance historic fragmentation.