DIGITAL PAYMENTS AND MICRO PENSIONS

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1. ROLE OF PAYMENTS IN BROAD-BASED DIGITAL PENSION INCLUSION

The previous book by pinBox, "Saving the Next Billion from Old Age Poverty" covered the progress made in pension inclusion by multiple African and Asian countries. There was one common contributor to their success – a thriving, inclusive digital payments ecosystem.

The realization that the vision of broad-based pension inclusion rests entirely on the back of a ubiquitous, seamless, and affordable digital payment infrastructure has been a recent one. It's only been in the past decade and half, with the advent of mobile money and mobile banking on the African continent, Aadhar enabled e-payments in India, the Alipay and WeChat pay led payment revolution in China, bKash in Bangladesh, and the rise of alternative digital payment channels in Latin America that instant payments for the masses have become a possibility. The emergence of these new digital payments models, powered by new digital ID systems and technological infrastructure have led to 515 million adults being financially included between 2014 to 2017 (World Bank Findex[1] data) globally. In fact, in the 10-years spanning 2011 to 2021, digital account ownership increased by 50 percent, covering 76 percent of the global adult population (Findex 2021). In the case of Sub-Saharan Africa (SSA), the bulk of this progress was driven entirely by mobile money.

Digital payment systems like mobile money, filled a huge latent demand - a need for reliable, affordable, real-time peer-to-peer payments. Other types of use-cases like purchasing airtime (phone credit), bill payments, merchant payments, social welfare transfers, unsecured micro loans, micro-savings, and micro-insurance and more were layered on this primary use-case.

This explosion in financial sector innovation, and particularly in digital payments, has had a transformative effect on the uptake

[1] *The Findex (Financial Inclusion Index) Survey is the world's most comprehensive database on financial inclusion. It is also the only global demand-side data source allowing for global and regional cross-country analysis to provide a rigorous and multidimensional picture of how adults save, borrow, make payments, and manage financial risks.*

https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows

of digital financial services, particularly by under-banked and unbanked segments. Digital payments have become and will remain a critical enabler of broader and deeper pension inclusion. Thus, increasing the long-term financial resilience of individuals and households.

Digital Payments 'unblocked' multi-decade old challenges around informal sector pension inclusion. One of the biggest challenges of achieving a broad based and truly inclusive micro-pension program in emerging markets including African countries has been the demographic that it targets - financially excluded, non-salaried informal workers with intermittent incomes, distrusting of and intimidated by traditional financial institutions, extremely price sensitive, with limited literacy, and unable to deal with cumbersome formalities that usually come with multiple prerequisites. Digital payments like mobile money on the other hand required people to only have a mobile phone. Powered by easy to onboard, and relatively simple and convenient products, with real time transaction processing and confirmation, combined with a large cash-in cash-out infrastructure of agents, digital payments were designed to serve this underserved and untapped demographic. As mentioned earlier, the providers of mobile money on the continent have onboarded millions of users, and today, Sub Saharan Africa (SSA) boasts of 605 million registered mobile money accounts[2], 30 percent of which are active on a 90-day basis and growing. To put this feat in context, the population of SSA is only 1.17 billion people.

Digital payments are the modern-day financial sector rails (like railway tracks) that are a critical piece of must-have infrastructure for successful pension system design and delivery. Digital payments capabilities benefit both pension plan sponsors and intermediaries (supply side) and beneficiaries (demand side). For pension scheme sponsors and providers,

[2] *GSMA, State of the Industry Report 2022*

digital payments enable secure, remote payment contributions into retirement saving products, and direct digital payouts of pension benefits post retirement. Digital payment platforms are specifically designed to process and reconcile high volume small value transactions. Moreover, most digital payment platforms have functionalities that allow for periodic auto-debit features as well (regulation permitting)[3] – that can have a profound impact on voluntary savings persistence. On the African continent, bank-agents and mobile money agents are usually non-exclusive. Meaning, the same agent can provide services for customers of multiple banks or mobile money providers, resulting in a sizeable agent network or cash-in cash-out infrastructure[4] penetration. Payment platforms also come with other functionalities like ID verified store of value (wallet or account), ability to conduct Below The Line (BTL) marketing to millions of customers, ability to onboard several thousand clients digitally in a short span of time, educate customers either through SMS or through in-app messaging in case of smartphones, resolve customer complaints, especially those related to payment reconciliation or fraud (through call centers, artificial intelligence based chat bots), and more. These functionalities are the building blocks for an inclusive, digital pension system and also enable micro-pension sponsors and providers to achieve low transaction costs. This in turn ensures that the gains and long-term savings of informal workers are largely preserved and not washed away by high transaction costs and charges.

The rapid pace of digital payment adoption, if channeled and designed appropriately, has the potential to reap long-term dividends for both pension policy makers and pensioners.

Below are two heat maps from the OECD[5] that show very shallow pension penetration on the African continent when compared to other economies (especially developed countries).

[3] Auto-debit features have usually been the purview of banks and even that is associated with certain products like loans or regular bill-payments. Financial service providers, depending on the laws and regulation of the country, must gain regulatory approval for auto-debit features. Additionally, with increasing data protection guidelines they also must demonstrate customer consent or opt-in for auto-debit features.

[4] It is important to note that the agent network usually thins out in rural areas since transaction volumes are not high enough to ensure the viability of multiple agents.

[5] Organisation for Economic Co-operation and Development

Figure 1.1: Assets in retirement savings plans around the world, 2020 or latest year available (in USD trillion)[6]

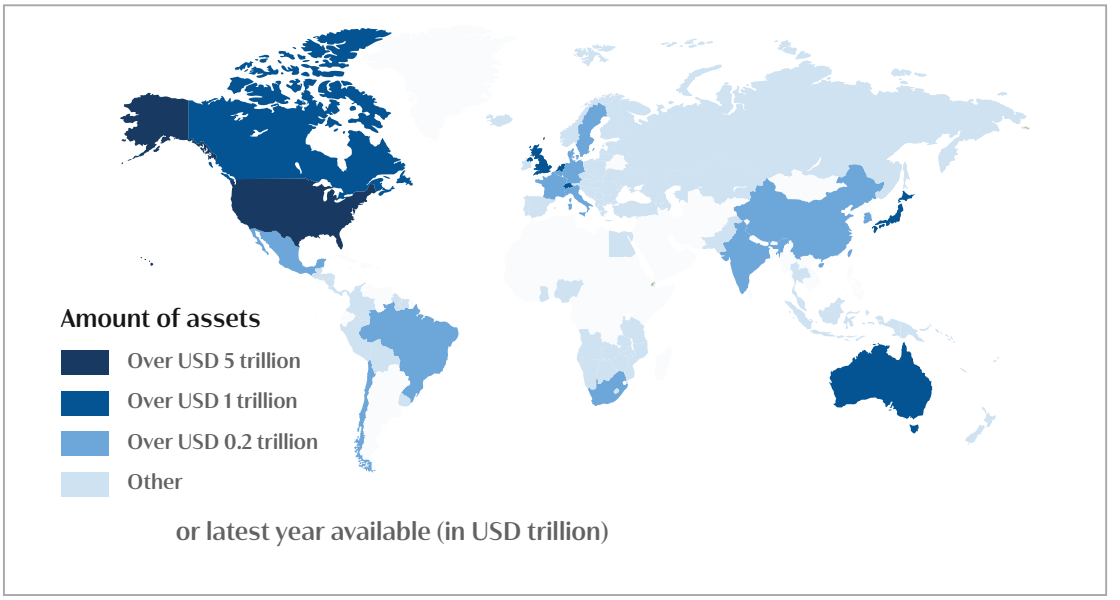
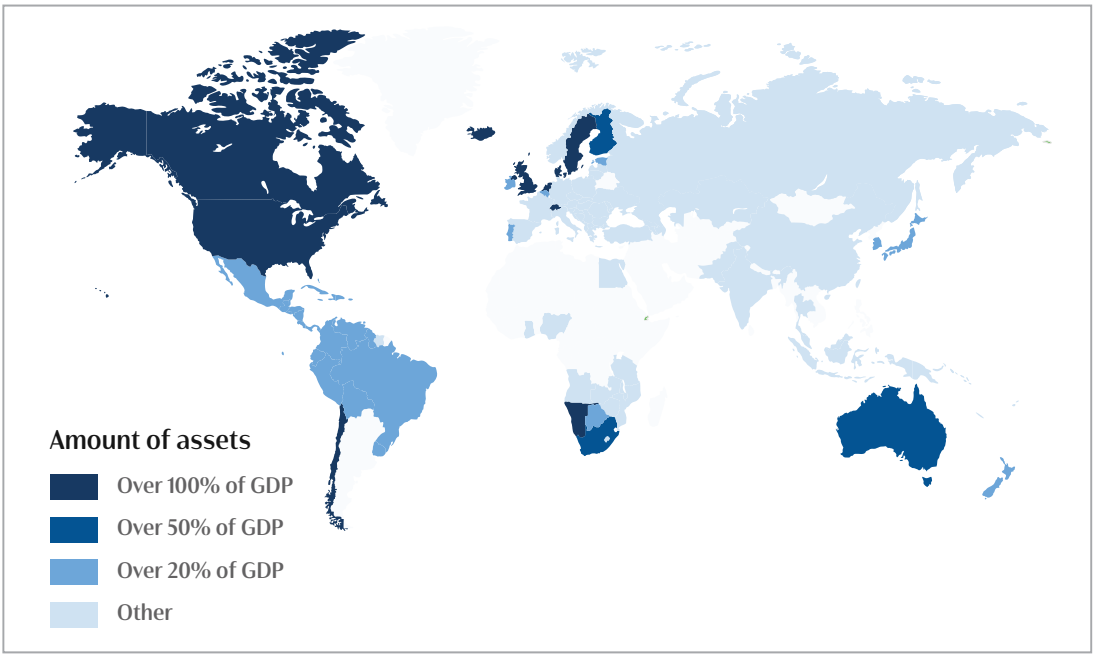


Figure 1.2: Pension Assets as a percentage of GDP



Given how critical the design and delivery of digital payments are to pension access and uptake, pension regulators might want to consider taking a keen interest in their set-up and evolution. The first step would of course involve a tighter and a more structured collaboration with other financial and non-financial sector regulators such as central banks, capital markets regulators, financial intelligence authorities, communication commissions, competition commissions, and data protection and privacy authorities.

The second would be gaining a strong understanding of how the digital payments market is being shaped in their country. This has two parts. Part-one includes gaining a better understanding of the enabling ecosystem spanning regulations, infrastructure, pricing, and competition, to customer-centric products and services, uptake of core digital financial products and the 'trust' that consumers have in digital payments. These fundamental elements have the power to positively (or negatively), impact the success of layering digital pensions on top of digital payments.

Part two involves investing in segmentation analysis. Segmented data of digital payments usage by demographic data across key variables like gender, youth, urban Vs rural penetration, domestic and international remittances, etc. can be critical inputs into pension product, access, and process design. This approach can be informative on many fronts, some of which are captured below.

(a) **Gender disaggregated data:** A lack of deliberate focus on gender-equity led pension inclusion has important fiscal consequences for governments. Women tend to live longer than men, which means that their retirement savings need to last longer. According to a July 2020 Brooking's Essay "How Does Gender Equality Affect Women in Retirement?", the average life expectancy post 65 is 21.1 years for women and 18.6 years for men (the gap being consistent across racial and ethnic groups). However, women tend to have lower retirement savings than men as their participation in the labor force is usually inconsistent due to factors like social norms, the type of economic opportunities they can take up, caretaking and child rearing responsibilities, etc. In fact,

poverty rates in retirement rise with age[7]. This means that women often go into retirement with less savings, with a higher life expectancy and will have to rely on the State and/ or their family for basic income support for multiple years.

Digital payments and their uptake by women (sex disaggregated data), can be excellent proxy indicators for pension regulators. Women who are financially excluded are more likely to be dependent in their old age. Also, digital payment trails provide critical information on money inflows and outflows, and how relatively well-off women are, or about their family circumstances and ties. Aggregate information of this nature could be excellent inputs into pension system design including product features and rules, as well as customer acquisition, marketing, and retention strategies.

(b) Urban Vs Rural: As mentioned above, broad-based pension inclusion, especially among the informal sector, requires a pervasive country-wide payments infrastructure. Despite the progress on mobile banking, and mobile money on the continent, there is still a strong urban Vs rural divide when it comes to IT and digital financial services infrastructure, and consistency in quality. This has a huge implication on digital financial services access uptake and reliability – affecting trust, which consequently has an impact on digital pension uptake, and persistence in pension contributions.

The World Bank's Findex data, that provides high level segmented information on financial inclusion, and on the uptake of digital payments and other financial services across key demographics, might be a good starting point for pension policymakers.

Table 1 below showcases top SSA countries ranked by total retirement assets as a percentage of GDP (based on latest OECD statistics) and how strong financial inclusion and digital financial services uptake in these economies (World Bank's Findex data) are. As demonstrated, some countries like Namibia, South Africa and Nigeria have a strong bank-led digital payments model, while others have a mobile money led one.

[7] *Poverty rates for women aged between 65-69, are about 8.6% compared to 13.5% for women 80 or older (Congressional Research Review, Poverty Among the Population Aged 65 and Older, 2022).*

Table 1: Percentage of Pension Assets to GDP compared to Financial Inclusion Penetration (mobile money vs. financial institution led)

Ranking	SSA Country	Total Assets in retirement savings plans as % of GDP 2020 (or latest year available)	Type of Digital Payments	Latest Data Year (Findex, WB)	Any Account (% age 15+), all formal Fis + Mobile Money	Account, female (% age 15+), all formal Fis + Mobile Money	Account, male (% age 15+), all formal Fis + Mobile Money	% Financial Institution account only	FI a/c, female (% age 15+)	FI a/c male (% age 15+)	Mobile money account (% age 15+)	Mobile money account, female (% age 15+)	Mobile money account, male (% age 15+)
1	Namibia	101.8	FI-led	2021	71%	69%	74%	65.60%	62%	69%	42.60%	41%	44%
2	South Africa	92.1	FI-led	2021	85%	86%	85%	84.10%	85%	83%	36.60%	39%	34%
3	Botswana	47.2	FI-led	2017	51%	47%	56%	45%[8]	41%	49%	25%[9]	21%	29%
4	Malawi	16.4	Mobile Money-led	2021	43%	38%	48%	20.20%	17%	24%	34.30%	30%	39%
5	Kenya	13.3	Mobile Money-led	2021	79%	75%	83%	50.60%	45%	57%	68.70%	66%	71%
6	Rwanda	12.67[10]	Mobile Money-led	2017	50%	45%	56%	37%	33%	41%	31%	26%	37%
7	Zimbabwe	10.1	Mobile Money-led	2021	60%	54%	66%	29.20%	24%	35%	50.60%	46%	56%
8	Tanzania	8.3	Mobile Money-led	2021	52%	46%	59%	23.30%	16%	32%	44.60%	40%	49%
9	Nigeria	8	FI-led	2021	45%	35%	55%	45.10%	35%	55%	8.70%	5%	12%
10	Uganda[11]	7.7	Mobile Money-led	2021	66%	65%	67%	36.60%	35%	38%	53.80%	53%	55%
11	Ghana	5.7	Mobile Money-led	2021	68%	63%	74%	39.20%	32%	47%	59.70%	55%	65%
12	Zambia	2.9	Mobile Money-led	2021	49%	45%	52%	23.80%	21%	27%	41.60%	39%	44%
13	Angola	1.6	FI-led	2014	29%	22%	36%		22%	36%			
14	Mozambique	1.1	FI-led	2021	49%	39%	61%	38.60%	31%	47%	29.40%	21%	38%

[8] *Author's estimate based on Findex data*

[9] *Author's estimate based on Findex data*

[10] *Estimated. Source: The Global Economy, Pension Fund Assets to GDP*

[11] *According to the Uganda Retirements Benefits Authority's latest report this percentage is closer to 11% in 2022.*

DEFINITIONS:

1. Account (Percentage 15+) refers to the percentage of respondents who report having an account by themselves or with someone else at a bank or any other type of financial institution or report using a mobile money service personally in the past 12-months;

2. Financial institution account refers to the percentage of respondents who report having an account by themselves or with someone else at a bank or any other type of financial institution.

3. Mobile Money account: The percentage of respondents who report personally using a mobile money services in the past.

Namibia, South Africa, and Botswana that top the rankings table in SSA for pension assets to GDP are upper-middle income countries with more mature and formalized economies characterized by a high degree of bank-led financial inclusion. These countries were already advanced in terms of financial inclusion rankings in SSA before the mobile money revolution began on the continent. Interestingly, Nigeria, one of the biggest economies on the entire African continent, is still heavily dominated by a large informal sector that does not actively participate in the pension sector and that's easily reflected in its pension assets to GDP ratio.

More importantly however, what is clear from the above table is that the rise of digital payment acceptance can be an excellent enabler to a good pension ecosystem. The typical 'friction' associated with persistence of pension contributions can go down significantly in a highly digitized economy.

2. UNPACKING THE CRITICAL ELEMENTS OF AN INCLUSIVE DIGITAL PAYMENTS ECOSYSTEM

There are many ways to slice and dice the key building blocks of a good payments ecosystem that can lead to a high degree of access and usage by citizens. The most used structure that covers all aspects of inclusive financial services architecture and delivery are (a) an enabling regulatory environment, (b) supply side building blocks, and (c) demand side building blocks, and the extent to which the key dimensions of each of these blocks are performing well. This chapter goes through the dimensions of evaluation of these three building blocks in detail and provides examples, where applicable.

2.1. Enabling Regulatory Environment

The GSMA produces an annual Mobile Money Regulatory Index which measures the regulatory enablers of mobile money adoption[12] across 92 countries[13]. The index scores each economy across six different dimensions and 26 different weighted indicators. While the focus for the index is entirely on how feasible mobile money is for a country, the framework and its variables are fundamentally relevant while assessing how supportive the regulatory framework of a country is in broadening and deepening financial inclusion, especially around non-bank models like mobile money, payment service banks, bank and non-bank led agent networks, and more. With the exception of a handful of countries in SSA, where traditional commercial bank penetration is very high, most countries in the region have benefited from non-bank models to increase financial inclusion and the digital payment footprint.

2.1.1. Dimension 1: Authorization of new forms of digital payments

Authorization across indicators like eligibility, various available payment instruments, capital requirements for existing and new

[12] *Along the guidelines developed by the OECD and European Union's Joint Joint Research Centre (JRC)*

[13] *https://www.gsma.com/mobilemoneymetrics/#regulatory-index?y=2021*

entrants (especially innovators like fintechs), and international remittances that allow for inflow and outflow of capital between diaspora and the local population are the key indicators to look out for under this dimension (GSMA).

Table 2

Dimension	Indicators	What to look out for as an actor in the pension value chain?
Authorisation	Eligibility	How easy or difficult is it for non-banks to offer new forms of digital payments? Are there set regulations that allow them to offer these directly, in partnership, or as a subsidiary, and is there legal certainty around how these entities are managed and how customer funds are protected in line with prudential regulations?
	Authorisation Instruments	What is the level of access and usage of various non-bank led payment instruments (products / services)?
	Capital Requirements	Are capital requirements proportionate to the non-bank models prevalent in the country or are they too burdensome? In some countries in SSA for example, the capital requirements are a percentage of the e-money issued (typically not more than 3%). An easy proxy indicator to measure this would be to see how vibrant the fintech industry is in a country. Is it dominated only by large international players (who are usually able to put up large capital or are local players also able to participate)?
	International Remittances	International remittances are possible for non-bank providers directly into the store of value (wallet, account) issued by them.

2.1.2. Dimension 2: Consumer Protection

A strong consumer protection focus is critical towards building 'trust' in digital payment ecosystems. Greater the trust, greater the consumer confidence in using digital payment products and services.

Table 3

Dimension	Indicators	What to look out for as an actor in the pension value chain?
Consumer Protection	Safeguarding of Funds	Are customer funds adequately protected? Do customers understand this and therefore trust the system?
	Consumer Protection Rules	Are consumer protection rules explicitly mentioned in regulations or applicable laws or central bank directives?
	Deposit Insurance	Are individual wallets or account holders of non-banks covered by deposit insurance?

2.1.3. Dimension 3: KYC (Know Your Customer)

KYC is an extremely important dimension in digital pension conversations. Whether a country has high ID coverage (whether full biometric coverage or tiered KYC) or not has a direct impact on broad based pension inclusion. Tiered ID (proportionate to risk which usually translates to access to basic vs. sophisticated services, and transaction accounts) usually benefits the elderly, disabled, and low-income, informal populations – the very demographics that pension regulators are trying to broaden pension inclusion to. In many cases on the continent, governments and pension regulators are already providing basic income programs to many of these marginalized groups.

An enabling KYC infrastructure, especially a biometrics based national ID, allows for a fully verified store of value (wallets or accounts), which then allows providers to verifiably provide digital payment solutions to their customers. It also allows for payment authentication, and verification functionalities that various providers might want to layer on top of the wallet/account.

KYC discussions often focus on ID verification for individual accounts. However, KYC for private pension sponsors, who are trying to collect member contributions through digital channels (e.g. the erstwhile Mbao-Mpesa platform in Kenya), is a critical dimension that needs to be considered.

Pension sponsors will also have to work within the constraints of National Payment System laws or guidelines around transaction account limits. Most regulations on the continent have clauses or statutes that allow for corporate or merchant collection accounts that are uncapped or have very large wallet size tiers to allow for collection of digital payments. Obviously, the size of the corporate wallet depends on whether all documentation has been provided in accordance with applicable laws.

Table 4

Dimension	Indicators	What to look out for as an actor in the pension value chain?
KYC	Permitted Identifications	Can other identifications be provided for in case National ID is not pervasive or does not enjoy a very high penetration?
	KYC Requirements	Tiered KYC is permitted
	KYC Proportionality	

2.1.4. Dimension 4: Agent Network

Agent networks (bank, non-bank) are the fundamental infrastructure of digital payments. They help convert cash to digital e-value and vice versa. However, mobile money agents, Payment Service Banks and agent-banking models do much more than a 'conversion' function. CGAP at the World Bank recently did a series of research and knowledge outputs on agents beginning with their blog "Why Do CICO[14] Agent Networks Matter and How Do We Promote Them?" In this knowledge series they produce a strong evidence-based case on how agents are a foundational layer in ensuring 'trust' in a digital payment system. They are also the providers of basic product literacy. An efficient, geographically well spread-out agent network with good customer experience (meaning, agents have enough float and can rebalance easily) are a prerequisite to an inclusive pension system.

[14] *CICO = Cash In, Cash Out (referring to cash deposits and withdrawals at bank and mobile money agent points)*

Table 5

Dimension	Indicators	What to look out for as an actor in the pension value chain?
Agent Network	Agent Eligibility	Is the regulation extremely stringent on who can be an agent (bank and non-bank agent)? Is this stopping the establishment of a geographically well spread out and dense agent network? If an already widespread and dense agent network already exists, then this might not be an issue, otherwise it might be worth investigating.
	Agent Authorisation	In many jurisdictions agent regulations can be quite prescriptive. Some countries require operators to gain regulatory approval for every agent onboarded, which has a big impact on how soon an agent network is rolled out in the country. An ideal circumstance would be where the regulations or central bank guidelines are very clear on the eligibility criteria of agents and the liability of onboarding suitable agents is left to the provider.
	Agent Activities	Most central bank regulations are prescriptive (for good reason) on what functions an agent can conduct. They are usually restricted to KYC enrollment / or collection of documentation, cash-in and cash-out services.
	Agent Liability	A provider is always responsible for the actions of its agents.

Non-Exclusive Agents: Mobile money in multiple Sub Saharan African countries began with agent exclusivity. Bank and mobile money agents are independent entrepreneurs or businesses. In the early days, if an agent had signed up with operator A, they were not allowed to serve clients of operator B. Given that finding viable agents that have the seed capital to invest in any agency business is hard, especially in rural areas, exclusivity clauses became a significant barrier to building a competitive and inclusive financial sector. Subsequently Central Banks on the continent issued guidelines or regulations that categorically stated that agents cannot be exclusive and any practices (direct or indirect) by providers to enforce any form of exclusivity would invite huge penalties[15]. Today, most agent networks are non-exclusive, and agents can serve clients of multiple providers.

[15] *Agents for Everyone: Removing Agent Exclusivity in Kenya and Uganda (Rafe Mazer, Rashmi Pillai, Stefan Staschen).*

2.1.5. Dimension 5: Transaction Limits

Table 6

Dimension	Indicators	What to look out for as an actor in the pension value chain?
Transaction Limits	Entry-level transaction limits and maximum transaction limits (proportionate to ID requirements and AML/CFT regulations).	Pension regulators and the private sector might want to pay attention to transaction and wallet / account limits, especially those issued by non-bank providers. Daily and monthly transaction limits, including how much an e-wallet can hold are critical inputs into pension contribution payments and pension payouts (especially provident payouts that usually lump sum payments).

2.1.6. Dimension 6: Infrastructure and Investment Environment

The sixth dimension of the GSMA framework looks at multiple infrastructure and market enablers. These sub-dimensions are a marker of how mature an e-money system is in an economy and how serious policy makers are about digital payments and digital financial inclusion. Some of these dimensions will be addressed through the Supply Side building block in the next section.

Table 7

Dimension	Indicators	What to look out for?
Infrastructure and Investment Environment	Affordability	High Charges and the Poverty Penalty: Peer-to-Peer (P2P), Bill Payment and Cash-out (withdrawal) charges at agents (bank or mobile money) can be prohibitive in multiple countries in SSA. As demonstrated in the section below on "Demand Side Blocks" the withdrawal charges especially for lower tiers can be extremely punitive, which implies that people use e-money platforms only when they absolutely need to OR require the payer to include withdrawal charges. Negative Impact of emerging fiscal policies directed at mobile money and other e-payments: Over the past 5 years, multiple African governments have increased excise duty, Value Added Tax (VAT), Stamp Duty and Corporate Income taxes for the provision of mobile money services. In addition, countries like Uganda, and Ghana also have transaction taxes that are imposed on the value of the amount transacted, while countries like Cote d'Ivoire have flat taxes on deposits. This has a direct impact on the cost of digital payments as providers usually pass these taxes onto consumers, having a direct impact on consistent use of these services. Pension policy makers should consider negotiating zero-rated access, and tax relief to pension contributions done digitally and no additional taxes applied to pension pay-outs withdrawn through digital channels.

Dimension	Indicators	What to look out for?
Infrastructure and Investment Environment	ID Verification Infrastructure	Pension Inclusion needs functionalities like real time ID verification from National ID databases, payment authentication and verifications and retirement payouts tied to ID, at costs that are extremely affordable to providers and beneficiaries. Ideally, ID systems should go beyond just the provision of a single national identity card. It should have the capability to open its systems via Application Programming Interfaces (APIs) that can share biometric and non-biometric details of pension beneficiaries to allow for easy onboarding, contributions, and pay-outs.
	Interoperability	Interoperability allows for the movement of money across providers, i.e. from one wallet or account to another. Interoperability, if designed well, can increase the uptake and velocity of payments and can support a country's acceleration towards a 'cash-lite' economy. Central banks across the continent are in the process of, or have already established National Switches to not only enable the interoperability of domestic retail payments but to then also plug into regional economic payment infrastructure to allow for cross-border payments. This development will be most pertinent to voluntary and private pension schemes where 'payers' could be sending their pension contributions across multiple wallets or accounts, and sometimes across borders, to a single collection destination.
	Settlement Access	Most non-bank providers on the continent do not have access to a country's retail settlement architecture, i.e. Real Time Gross Settlement (RTGS). They are typically reserved for commercial banks who need to fulfill stringent criteria to be part of the RTGS. Given the exponential rise of non-bank digital payment options, ongoing national switch projects led by the Central Bank in multiple SSA countries are planning to provide non-banks, either directly or indirectly (through commercial banks), access to the RTGS system to allow settlements that will enable irrevocable, real time interoperable payments.
	Interest Payments	Not directly applicable in the case of pensions architecture.
	Financial Inclusion Strategy	Most SSA countries today have a financial inclusion strategy. Financial inclusion is a key policy goal of various African governments.
	Data Sovereignty	Multiple SSA countries today have strict data privacy and protection rules. These include what elements constitute Personally Identifiable Information (PII) data, processes for annual license fees and approvals, storage and sharing of PII data and more importantly customer consent. Some of the data privacy laws also have strict, prescriptive applications like 'data residency', meaning, sovereign data should not leave the country. This has a direct implication on how digital financial services are set up. Often, cloud architectures that store anonymized data outside sovereign soil are cost-efficient but might contravene data protection and localisation laws. Pension regulators and actors in the private sector will need to pay particular attention to data sovereignty and privacy laws. They have a huge implication for pension system architecture and process design, how the technical infrastructure on beneficiary information is set up, and more importantly, the costs of this 'architecture'. Stricter and more prescriptive data privacy laws can increase technical backend costs, thereby increasing transaction costs.
	Gender Equality	As shown in the next two sections on Supply Side and Demand Side Building Blocks, gender agnostic digital financial services will have a detrimental impact on pension goals. Literature by Women's World Banking, GSMA, The World Bank and Gates Foundation among others, have clearly demonstrated that gender deliberated digital financial services, and especially digital payments, are critical to include women into formal financial services. As mentioned above, given that women outlive men and typically go into retirement with less savings than men, a gender deliberate digital financial inclusion strategy is critical to the success of an inclusive pension program.

2.2. Supply Side Building Blocks

2.2.1. The Ground Floor

If digital payments are the 'rails' of an inclusive pension system, then fundamental Information, Communication and Telecommunication (ICT) and ID infrastructure are the 'ground floor' or foundation of those rails. Without ID and ICT infrastructure, scalable digital payments cannot exist.

A. **Identification (ID):** The significance of identity and its transformational potential is not restricted only to the financial services sector. Identification provides access to a host of domestic and global government and private sector services and economic opportunities. Given that nearly a billion people globally lack this foundational document, The World Bank's ID4D program is dedicated to help governments across the world make digital ID infrastructure a reality.

   Lack of a digital national ID can be a big barrier to accessing financial services. Marginalized segments such as rural women, farmers, migrants, and refugees, a demographic that pension regulators specifically want to include, often lack identification. Table 8 classifies ID penetration among adults (aged 15 years and above) across SSA countries. Of the 42 SSA countries included in the ID4D WB database, the latest statistics on ID penetration was only available on 25 countries. However, this dataset is a good indicator of the positive strides that the continent has made in recent years on ensuring ID access and uptake.

Table 8

	ID ownership (% age 15+)	ID ownership, female (% age 15+)	ID ownership, male (% age 15+)
Median	73	72.8	77.4
Mean	71.7	69.7	73.9

Source: Author's computations

A note of caution: Pension regulators and sponsors of pension regimes will have to pay careful attention to ID related challenges in their country. For e.g., Uganda, a country that is well known for reaching nearly 73 percent ID penetration among adults aged 15 years and above in an extremely commendable span of 5-6 years, still has a lot of challenges around ID access that it is working to overcome. For example, spelling mistakes in ID cards force individuals concerned to pay roughly UGX 50,000 (USD 13.41 USD[16]) to obtain a new ID. A similar expense is incurred in ID replacement - which is especially prohibitive for low-income individuals. In fact, it is common practice for many individuals to set up mobile money wallets using IDs of relatives and friends, given the challenges and cumbersome bureaucracy associated with obtaining an ID.

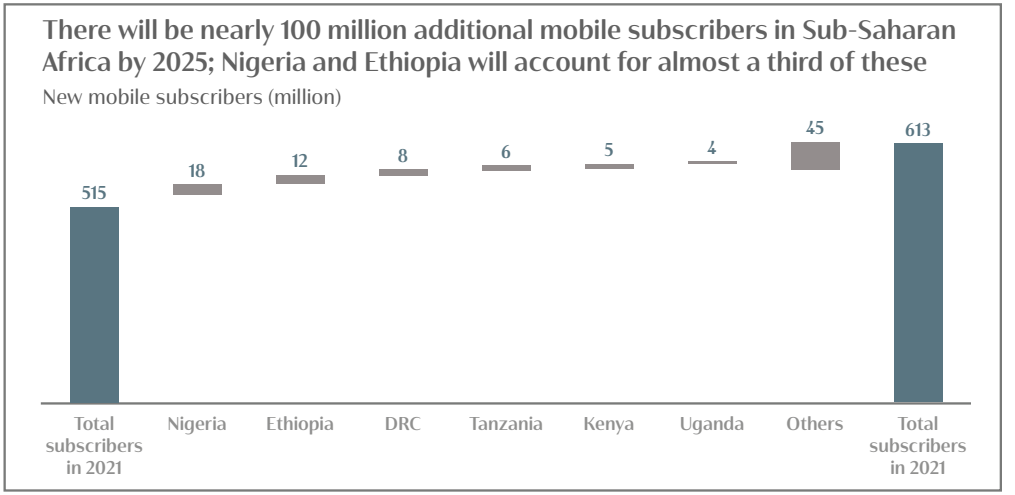
Pension regulations and guidelines require accurate ID and KYC verification. Therefore, if pension actors plan to collaborate with digital payment providers, they will have to figure out the most efficient ways of ensuring KYC compliance and should not simply ride on the existing ID information being provided by digital payment providers.

B. Phone Penetration: According to the Mobile Gender Gap Report 2022 (GSMA), women in low- and middle-income countries are 7 percent less likely than men to own a mobile phone. That gap widens to 18 percent when it comes to smartphone adoption. Affordability, lack of literacy, and income are some of the key reasons cited for lower phone penetration in SSA.

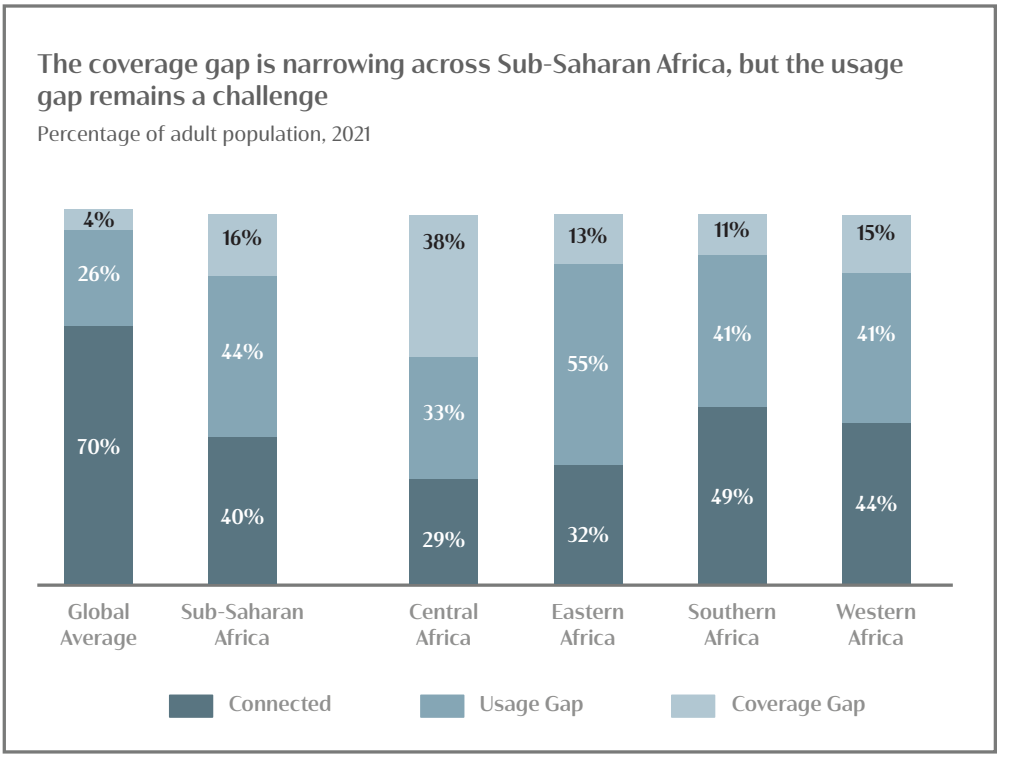
However, the overall growth of mobile phone penetration shows some very positive trends as demonstrated in the next 3 graphs below. Overall mobile phone penetration is expected to increase to 613 million by 2025, with smartphones accounting for 61 percent of these connections.

[16] *January 2023 exchange rates*

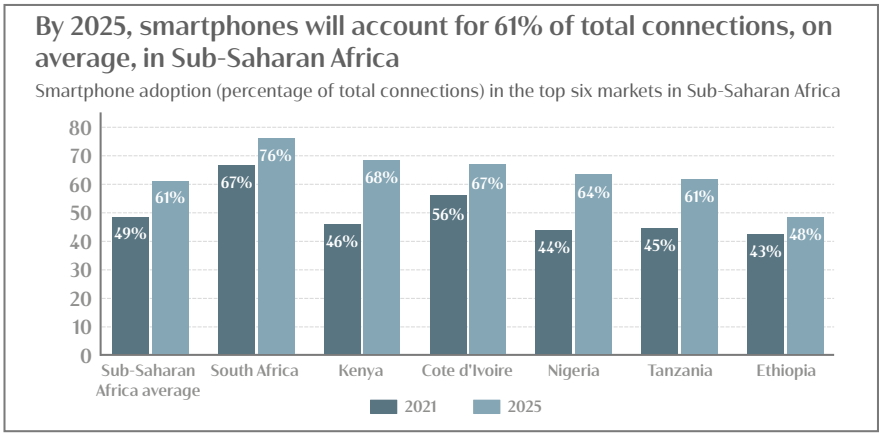
Figure: Growth in mobile phone subscriptions in SSA



Source: GSMA Intelligence



Source: GSMA Intelligence



Source: GSMA Intelligence

C. **Internet Penetration:** According to GSMA and World Bank Statistics, SSA and South Asia have the widest gender gaps in mobile internet usage. The gap in SSA stands at 37 percent compared to 41 percent in South Asia. Unfortunately, the mobile internet gap has stalled and not improved in recent years, which could be a significant barrier to developing internet enabled or smartphone-based applications and literacy materials around pensions. As demonstrated in the chart below, the mobile internet usage gap in SSA compared to the global average is quite wide.

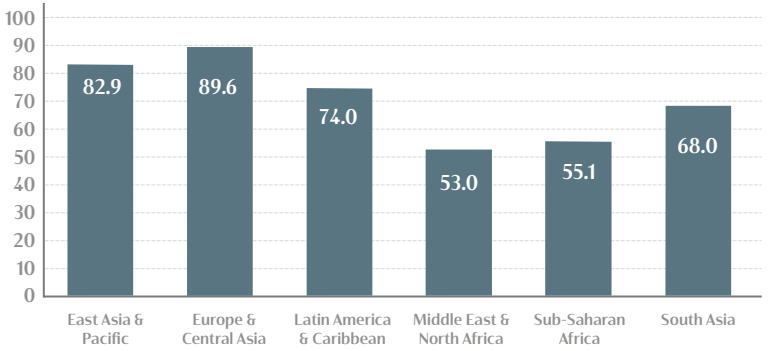
2.2.2. Supply Side Payments Infrastructure

A. **Digital Account Penetration:**

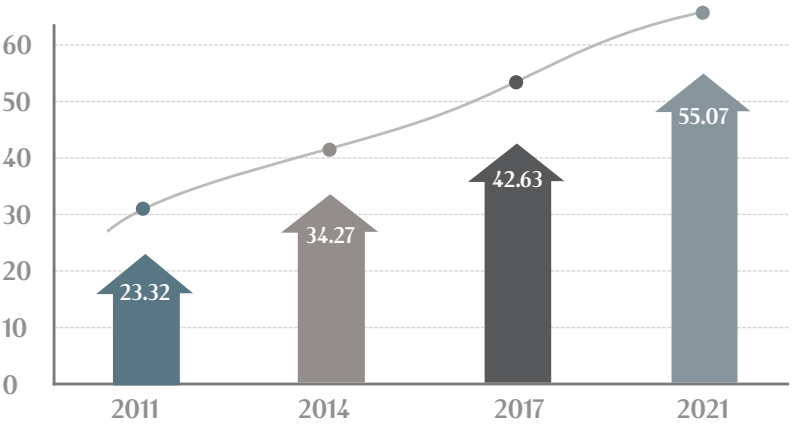
According to Findex 2021, worldwide account ownership stood at 76 percent of the adult population. In the case of SSA, aggregate account ownership by adults (those aged 15 years and above), either at a financial institution or via a mobile money account was 55 percent. As the graph below demonstrates, SSA has been making significant strides in account ownership and financial inclusion year-on-year. A

large part of this progress on the continent is driven by mobile money. However, if we compare the region with other regional blocks like Latin America and the Caribbean, Middle East and North Africa, East Asia and the Pacific, Europe and Central Asia, account ownership in SSA is in the bottom second. The only other block that has lower account ownership (at 53%) is the Middle East and North Africa.

Account Ownership (bank or mobile money), adults (15 years and above)



% of population (15+) that own an a/c at a FI or with a mobile money provider, SSA



The gender gap[17] In account ownership SSA is double at 12 percentage points compared to the global average at 6 percentage points. Countries like Nigeria, Mozambique and Cote d'Ivoire top the list in terms of gender inequality regarding financial access.

While pension sponsors should certainly leverage digital accounts and digital payments in the implementation of pension systems, the big gap in formal digital account ownership might require a hybrid combination of pension contribution collection channels or modes. For example, scheme sponsors might want to consider Over the Counter (OTC) pension payments through the agent network of mobile money and bank partners in addition to direct digital payments. The pension contribution can be thought of as a product similar to a bill pay (for e.g., Uganda's National Social Security Fund contribution collections are a pay-bill collection).

B. Cash-In Cash-Out (CICO) Infrastructure:

Cash-in, Cash-out density on the continent has grown by leaps and bounds, beginning with mobile money agents, and then followed by banking agents where regulations allow for agent banking. Between 2012 and 2021, the number of active agents multiplied more than 10 times, from 534,000 to 5.6 million (GSMA, SOTIR 2022). CICO infrastructure, as mentioned above, is critical in helping people participate in the formal financial sector.

This should be welcome news for pension actors in the value chain. Higher CICO density ensures that pension contributions and pay-outs can be accessed by rural and marginalized populations.

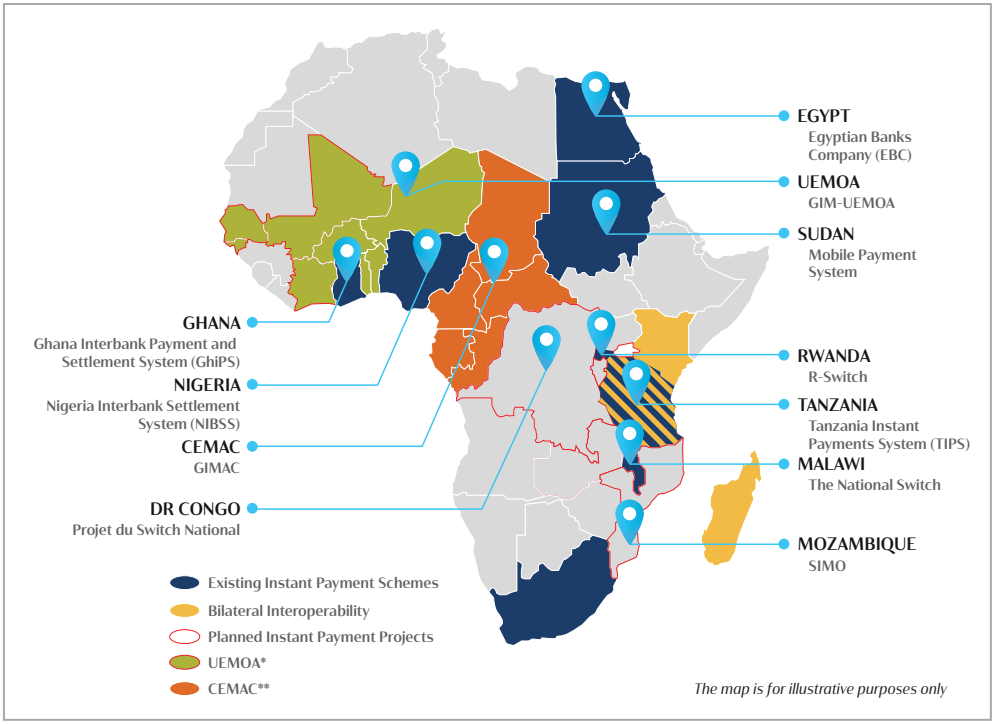
C. Interoperability and Instant Payments

Interoperability of payments, often facilitated by a National Switch, will benefit multiple private sector pension providers.

[17] Gender gap measures in percentage points the difference between % of adult men who are financially included compared to % of adult women who are financially included.

It expands their providers ability to accept bulk contributions irrespective of the mobile money operator or bank the contributions are coming from. Below is an illustrative map of the various instant interoperable payment schemes on the continent (many more are in the pipeline).

Development of instant payment schemes in Africa



D. Competitive Markets

A competitive financial market that allows for a diversity of players to compete on an equal footing is key to the growth of a digital payment's ecosystem. A competitive digital payments ecosystem empowers the customer to choose the best product for them. The rise of fintech is giving traditional telco-led mobile money providers, who have dominated mobile money on the continent serious competition. Wave in

Senegal, Côte d'Ivoire and Gambia is a good example. Wave's competitive product and price offering (0% cost on cash-in, and cash-out and only 1% on transfers) lowered mobile money prices in WAEMU by a significant percentage. However, as digital payments become more competitive, regulators and competition commissions (in countries where they exist) will have a greater role to play to ensure fair play that benefits the customer.

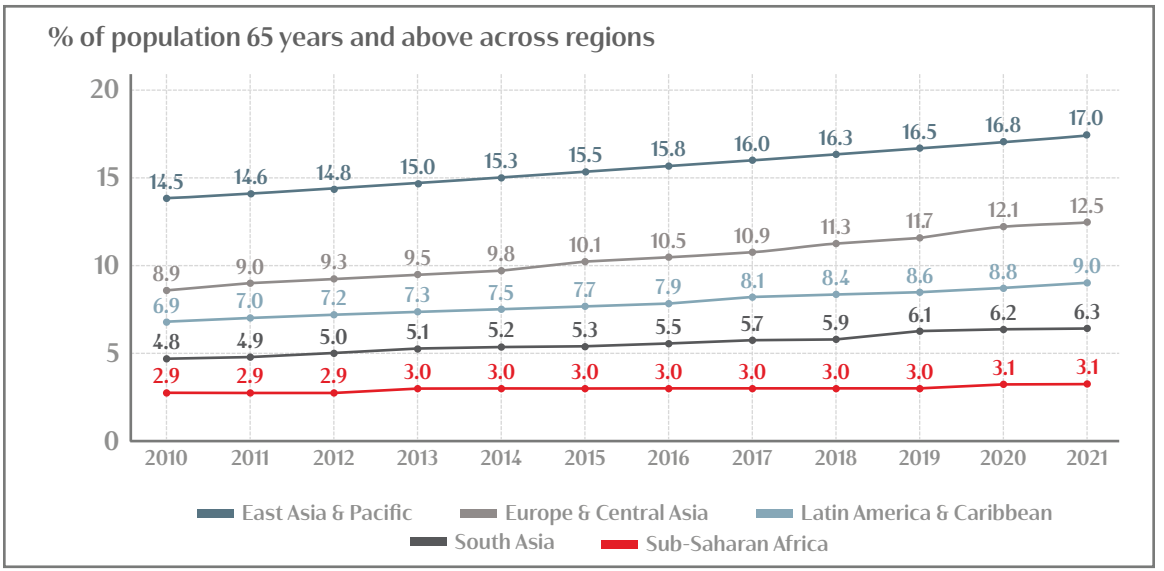
2.3. Demand Side

Most traditional pension systems have been designed for the formal sector. For salaried workers with steady paychecks, and defined exit periods from the labour force. However, traditional pension schemes and approaches are irrelevant to the informal sector that dominate African economies. According to the International Labour Organization (ILO) about 66 percent of employment in Sub-Saharan Africa is in the informal sector, contributing anywhere between 25 percent to 65 percent of GDP depending on the country. Additionally, unlike developed economies, the rate of urbanization on the African continent stood at 47 percent in 2020 (World Bank), meaning that 53 percent of the African population still resides in rural areas. Therefore, an inclusive pension scheme will have to consider not only informality of labor markets and the complexities that come with it, but also deal with a largely rural populace which has a direct impact on client outreach, education, onboarding, ease of payments and transaction costs.

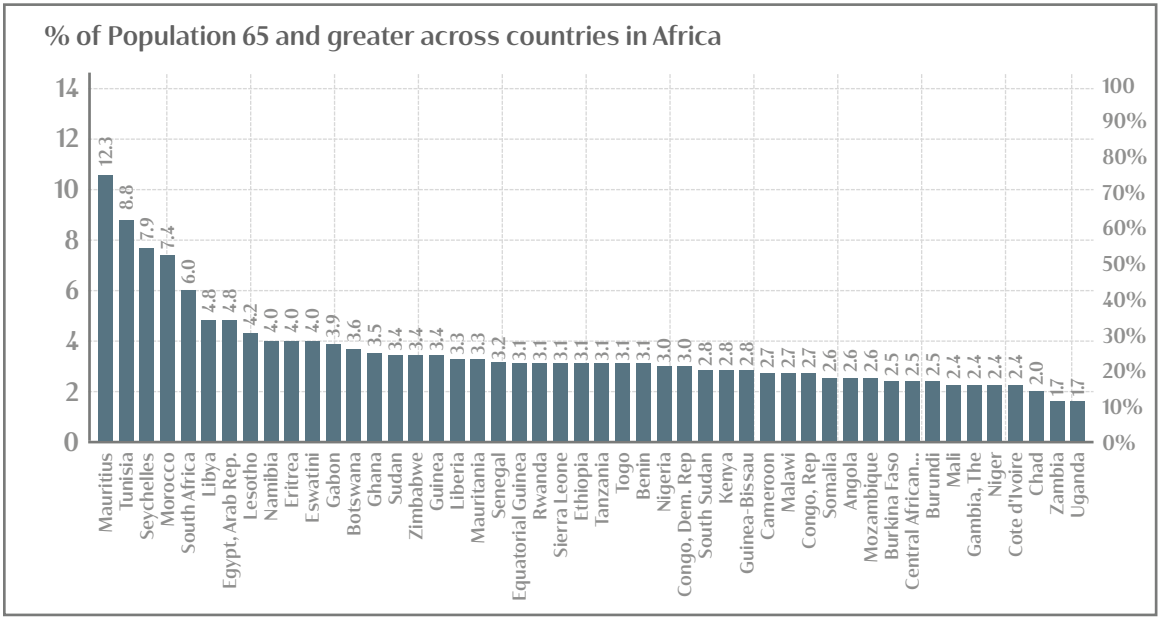
This subsection of the chapter will focus on three key demand side issues in digital financial services (and payments) adoption and enabling broad-based micro-pension inclusion. These are: (a) labor market characteristics pertinent to pension system and process design, (b) affordability of digital financial services, and (c) fiscal policy and its impact on digital financial service adoption.

2.3.1. Labour Market Characteristics

(a) Africa's demographics are changing and while the elderly population is small, the fiscal burden on governments is not insignificant. Based on The World Bank and ILO statistics, compared to other regions of the world, it might seem that the African continent does not have a massive aging population. In the figure below, the percentage of elderly (65 and above) in Europe and Central Asia stood at 17 percent in 2021 while in contrast, Sub Saharan Africa was at 3.1 percent. However, the small percentage masks the 'absolute' number or magnitude of the burden on African governments in terms of dependents that are not covered by pension schemes. According to the US Census Bureau [1] there were 34 million people aged 60 and over in sub-Saharan Africa in 2005. This number is projected to increase to over 67 million by 2030. In fact, the number of older people is growing more rapidly in sub-Saharan Africa (over 2 percent and is expected to reach a growth rate of 4 percent over the next 50 years) than in the developed world [2].



As demonstrated by the next graph, the higher income economies on the continent like Mauritius, Tunisia, Seychelles, and South Africa have a higher percentage of aging population.



The burden however is not insignificant on the remaining African nations. Uganda, for example, has the lowest percentage of elderly population (at 1.7%) compared to other African nations. According to the United Nations Population Fund (UNFPA) the absolute number of elderly in Uganda is estimated to grow from 1.3 million in 2012 to 5.42 million people by 2050[3]. Couple this with the statistic that 45 percent of the elderly in Uganda currently live below the international extreme poverty line of USD 1.90 (PPP per day)[4]. If the government of Uganda paid 45 percent of the elderly population in 2012 about 25 US cents a day as social protection it would have cost the exchequer about USD 53 million (133 billion Ugandan Shillings)[5] or 0.2% of GDP in 2012.

Most African governments do not have the resources to bear this type of a fiscal burden. The only way to protect a growing aging populace is to integrate them into pension schemes. But as

mentioned above the bulk of "Young Africa" resides in the informal sector.

(b) Young Africa is informal, but informal does not always mean poor. The informal sector world over is not homogenous. There is a huge diversity that resides within the labour force that participates in the informal economy. Segmentation of the informal economy is key to understanding:

- the size of the population that can afford to pay into a pension scheme,
- incomes earned by the informal sector workforce and the distribution of income across wealth categories, and
- the resilience or vulnerability of the households in the informal sector against economic shocks.

Types of households and saving needs

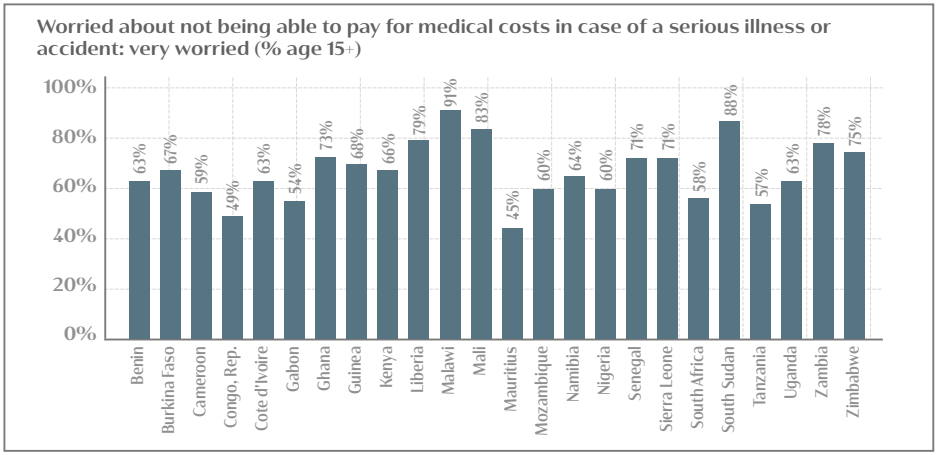
Poor	Short-term consumption-smoothing
Informal, vulnerable	"Precautionary" saving
Informal, non-vulnerable (INV)	Long-term savings
Formal	Already save through a formal pension scheme

Authors Clement Joubert and Fiona Stewart from The World Bank's Social Protection Team tried cracking this puzzle in a study called "Empirical Evidence on Ability to Save and Innovative Savings Mechanisms" in 3 countries – Kenya, Uganda, and Benin. The aim of the study was to better understand households employed in the informal sector and examine what percentage of these households were vulnerable Vs those that resembled households

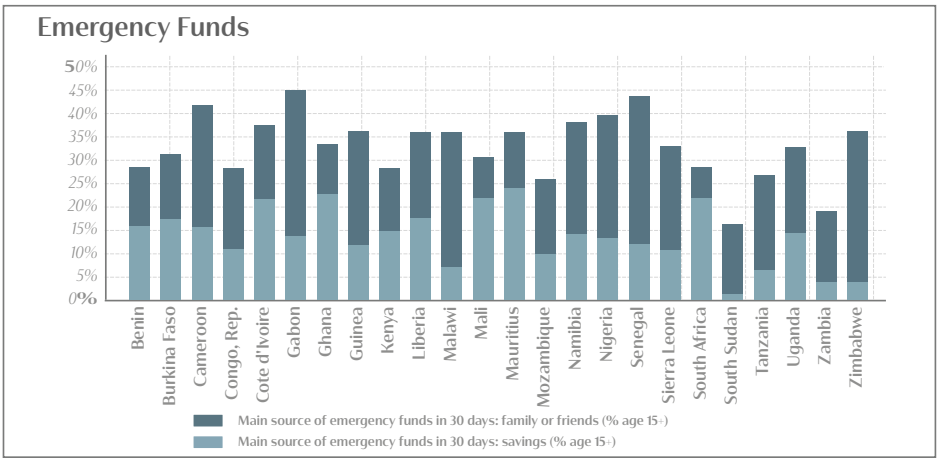
that had formal sector incomes and could therefore participate in pension schemes designed to match informal sector needs. The authors present an important framework on pension inclusion. On one extreme are households that earn income from the formal sector and are included by a formal sector pension fund. On the other end are the extreme poor who are not the target audience of a contributions-based pension scheme and might need consumption smoothing support like unconditional cash transfers. In the middle are two interesting groups – one that is informal and vulnerable to economic shocks, and a second that is informal and has some ability to absorb economic shocks. The latter segment is a low hanging fruit in terms of targeting for a pension program designed for the informal sector. According to the researchers mentioned above, 30 percent of households in Kenya, Uganda and Benin fell into the "Informal, Non-Vulnerable (INV)" category. To put it differently, the pension ready base that regulators and policy makers could target in these countries could easily expand coverage to 30 percent more households. However, if pension policy makers want to truly increase the scope of informal workers that can be brought into the pension net – reducing the vulnerability of the "informal, vulnerable" becomes important. This is where digital financial services like remittances, and insurance can play a big role in increasing the resilience of vulnerable households.

(c) Examining what vulnerability looks like is key to understanding design principles of informal sector pension funds. In order to better understand informality in the SSA region, let's look at four simple graphs from the World Bank's latest Findex report.

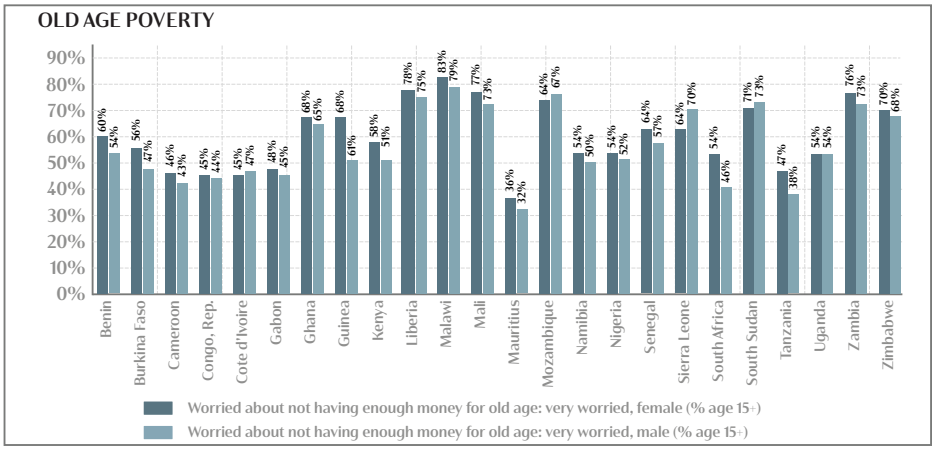
- Percentage of adults who are worried about a health-related economic shock. On average 67 percent of adults across 24 SSA countries are worried they will not have enough funds to cover medical care in case of serious illness or an accident (graph below).



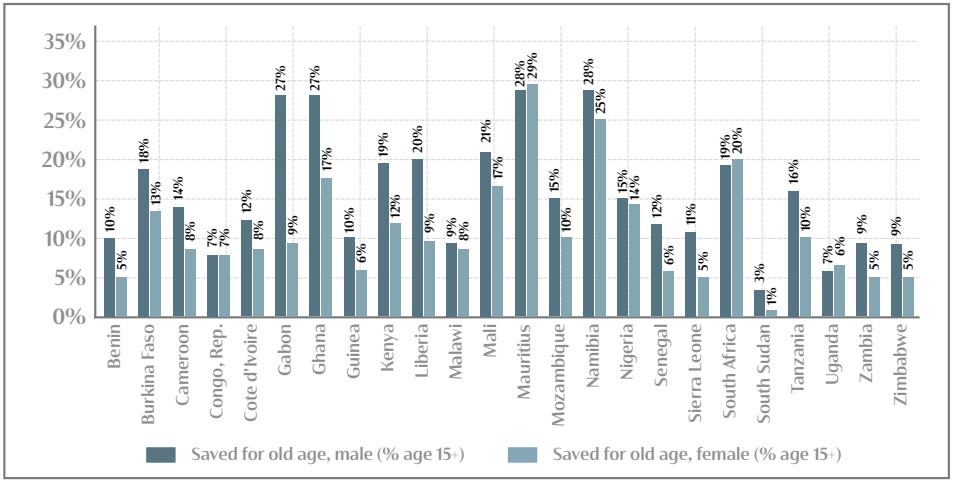
- Access to emergency funds. Overall, only 55 percent adults in 23 countries said they would be able to come up with emergency funds in 30-days in the most recent Findex survey. However, of these 55 percent, only 14 percent said it would be easy. The remaining 41 percent stated that accessing money for an emergency would be 'possible, but very difficult'. When further asked how they would raise the emergency funds needed, only 14 percent said they could rely on savings, while 33 percent said they would have to rely on social networks like friends or family.



- Percentage of adults who are worried about going into old age poverty. On average, women at 60 percent are more worried about old age poverty compared to men at 57 percent, across SSA.



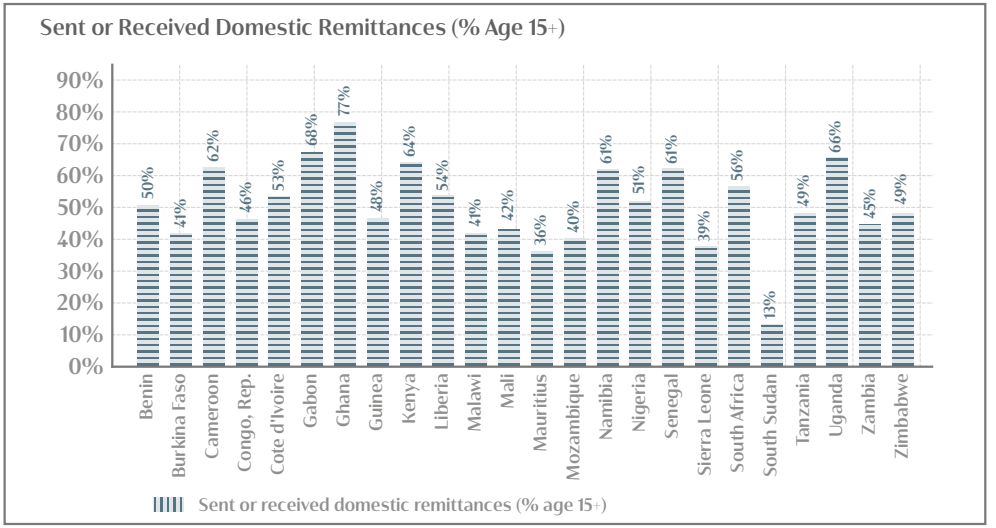
On average, 16 percent of adult men in SSA have saved for old age poverty compared to only 11 percent of women. Given that women's participation in the labour force is characterized by multiple entry and exists due to child and other caretaking responsibilities, or actively forsaking higher paying jobs since they come with higher commitments - it is not surprising that the amount of savings that women tend to accumulate over their lifespan is typically lower than men.



- The combination of the three variables – ability of adults in SSA to handle health related shocks, savings around emergencies and their worry about old-age poverty signals a very important need among the "Informal, Vulnerable" workforce. The need for risk mitigation solutions like insurance. Without risk mitigation mechanisms, the "Informal, Vulnerable" will not have enough funds to participate in pension schemes.

(d) Remittances and Pensions

Interestingly, digital payments have increased the volume and ease with which domestic and international remittances can be made and received. Remittances have proven to be a great economic stabilizer for households (especially against shocks and short-term consumption needs) [6]. Based on the graph below, in 2021 at least 50 percent of the adults on average in multiple African countries received or sent remittances (except for South Sudan). There could be a real opportunity for pension system and product designers to factor in international and domestic remittances as a source of long-term savings. Senders or recipients could choose to save a small percentage of remittances into contributions based pension programs, thus building long-term savings and resilience of informal sector households.



2.3.2. Affordability of digital financial services

With over a trillion dollars processed annually by the mobile money industry, and 1.35 billion accounts globally[7], mobile money has accelerated digital financial inclusion, especially in Sub Saharan Africa. Employers and employees that participate in traditional pension schemes today have the option to make pension contributions through banks and mobile money channels. For the latter, mobile money integrations for direct contributions into pension accounts are currently offered in mature mobile money markets only.

However, pension contribution pricing can be a real barrier for non-traditional pension schemes, especially voluntary schemes that are designed for the informal sector. The 'informal but non-vulnerable' and 'informal but vulnerable' segments mentioned above can be extremely price sensitive.

Given that mobile money operators are not deposit taking institutions and don't engage in financial intermediation, the prevailing pricing model is transaction driven. As highlighted in the CGAP[8] blog "How Do Mobile Money Fee Structures Impact the Poor", authors William Cook, Kyle Holloway and Rebecca Rouse discuss the diversity of pricing structures and effective pro-poor pricing of mobile money models. One of the key takeaways from the analysis is that the most mobile money pricing strategies (whether based on slab / tiered pricing[9], percentage pricing[10] or free[11]) end up being regressive. The poorest, who typically do small value transactions, end up paying a higher total percentage in fees, while the rich who make higher value transactions, pay a much lower amount relative to the value of their transactions.

To demonstrate the above point, let us take the example of Uganda's National Social Security Fund (NSSF) contributions. NSSF allows for mandatory and voluntary contributions via the two dominant mobile money operators – MTN Uganda and Airtel Uganda, as shown in the tables below. The prices have been listed in Ugandan Shillings (UGX). A quick comparison between the NSSF bill payment prices of the two operators reveals that the commonly used tiers (ranging between UGX 30,000 to UGX

125,000) are expensive for the end-user, ranging from a high 7 percent for a UGX 30,000 (~USD8[12]) contribution to a minimum of 2.80% for a UGX 125,000 (~USD33) contribution. The cost of contributing into NSSF is of course lower (as a percentage) for the highest contribution tiers.

Pricing Structure for MTN Uganda

Min	Max	NSSF	Min % cost of payment info NSSF	Max % cost of payment info NSSF
500	2,500	190	38.00%	7.60%
2,501	5,000	600	23.99%	12.00%
5,001	15,000	1,000	20.00%	6.67%
15,001	30,000	1,600	10.67%	5.33%
30,001	45,000	2,100	7.00%	4.67%
45,001	60,000	2,800	6.22%	4.67%
60,001	125,000	3,700	6.17%	2.96%
125,001	250,000	4,150	3.32%	1.66%
250,001	500,000	5,300	2.12%	1.06%
500,001	1,000,000	6,300	1.26%	0.63%
1,000,001	2,000,000	6,300	0.63%	0.32%
2,000,001	4,000,000	6,300	0.31%	0.16%
4,000,001	5,000,000	6,300	0.16%	0.13%

Pricing structure for Airtel Uganda

Min	Max	NSSF	Min % cost of payment info NSSF	Max % cost of payment info NSSF
500	2,500	190	38.00%	7.60%
2,501	5,000	330	13.19%	12.00%
5,001	15,000	1,000	20.00%	6.67%
15,001	30,000	1,600	10.67%	5.33%
30,001	45,000	2000	6.67%	4.67%
45,001	60,000	2,650	5.89%	4.67%
60,001	125,000	3,500	5.83%	2.96%
125,001	250,000	3,950	3.16%	1.66%
250,001	500,000	5,050	2.02%	1.06%
500,001	1,000,000	6,300	1.26%	0.63%
1,000,001	2,000,000	6,300	0,63%	0.32%
2,000,001	4,000,000	6,300	0.29%	0.16%
4,000,001	5,000,000	6,300	0.14%	0.13%

The current tiered pricing structure in many mobile money dominant countries in SSA might be a significant point of friction for informal workers with modest micro-pension contributions and will have an adverse impact on persistency.

Pension regulators and providers on the continent will have to work towards negotiating a better pricing model with mobile money and mobile banking providers if they want to make pension contributions seamless and affordable. Regulators might even want to consider having zero fees associated with pension contributions and instead bear the cost of pension inflows by directly negotiating a reasonable bulk pricing model with various collection channel partners, especially mobile money partners[13].

2.3.3. Fiscal Policy and the Impact on Digital Financial Service Adoption

This chapter would be incomplete without addressing a key emerging issue facing digital financial services on the continent – the rise of mobile money taxes. Taxes that are not equitable or fair, and which disproportionately affect the informal and hence more vulnerable sections of the economy, can easily derail both financial and pension inclusion ambitions. Mobile money is uniquely placed to help solve a critical problem facing broad-based pension inclusion – by providing secure, easy and affordable access to contributions-based pension schemes. However, an increase in taxes related to digital financial services are a serious threat to the pace of digital payment utilisation, and hence on voluntary micro-pension adoption on the continent.

Uganda is generally considered to be one of the first countries to kickstart the mobile money tax movement in Sub Saharan Africa in 2018[14] with a 0.5 percent tax on the value of cash-withdrawals at agent points. Post the Pandemic however, multiple African governments that faced immense fiscal pressures, have introduced various forms of mobile money tax. The key argument presented by governments is that the tax to GDP ratio for most

countries on the continent has been very small (early to mid-teens) and there is an urgent need to broaden the tax base by making the informal sector share the tax-burden. As mobile money is popular among informal sector workers, mobile money is an easy means of taxation. Today, countries like Ghana, Cameroon, Benin, Tanzania, and Cote d'Ivoire have all introduced various forms of mobile money taxes.

In 2022, Cameroon imposed a 0.2 percent tax on all mobile money transactions (transfers and withdrawals). The International Monetary Fund (IMF), in its country review of Cameroon[15] published in February 2022, lists broad level concerns around this emerging tax policy on the continent. It raised 3 key concerns: (a) in multiple African countries, the tax only applies to mobile money and not the banking sector, which creates an unequal treatment of payment channels, (b) taxing mobile money can be fiscally inequitable[16] and hinder financial inclusion growth, and (c) behavioral changes caused by such taxes could lead to unintended consequences such as loss of fiscal revenues.

The loss of fiscal revenue was immediately evident in Tanzania when it first imposed the mobile money tax on 30 June 2021. The initial tax burden ranged from TSH 10 ($.004) to TSH 10,000 ($4.28). This was later changed, due to public outcry and protests, and when key mobile money operators like Vodacom faced a loss in revenues[17] as people started moving to other channels and cash. The current burden of the revised mobile money levy on end consumers is presently estimated at 2.78 percent of the transaction value.

Ghana also recently implemented an e-levy, which began at 1.5 percent of transactions before it was revised downwards to 1 percent of transactions (Ghana Revenue Authority). The Ghanaian authorities argue that the mobile money tax is equitable as people who transact below 100 cedis (~$8.5) a day cumulatively do not need to pay this tax, thus protecting the most vulnerable in society. However, a paper by the International Centre for Tax and

Development (ICTD) titled "Mobile Money Taxation and Informal Workers: Evidence from Ghana's E-Levy" argues otherwise. The evidence in the paper based, on a sample of 2,700 informal sector workers, argues that taxes such as these are regressive as the informal workforce typically does not have bank accounts and therefore, unlike the banked, will end up paying a higher burden of the tax, thereby causing many users to move to cash transactions.

Interestingly, the West African Monetary Union (WAEMU) region countries have a tax on all deposits in the form of stamp duty across banks and mobile money in contrast to other African countries that are taxing transfers and withdrawals. This tax is a flat CFA 100 ($0.17) irrespective of the deposit amount. At the moment, Cote d'Ivoire is the only country in the region that is fully enforcing this tax across all deposit channels and irrespective of the transaction value. A tax of this nature not only creates a barrier for cash to digital conversion, but by introducing a flat tax on deposits, places the highest burden on low value users, thus hindering the growth of universal digital financial inclusion.

3. CONCLUSION

As mentioned at the beginning of this chapter, digital payments are the fundamental rails of broad-based micro-pension inclusion. The discourse around designing inclusive micro-pension programs has existed for decades. However, it was not until the arrival of digital financial services that rapidly included large swathes of the population in emerging markets, that there has been a real path to meaningful pension inclusion for the informal sector. Through this chapter, we hope that pension policy makers, regulators and providers in emerging markets will take a keen interest in how digital financial services are shaping their economies and form strategic partnerships with Central Banks and other relevant financial sector regulators in creating an enabling ecosystem for both digital financial inclusion and digital micro-pension inclusion.

REFERENCES

[1] https://www.ncbi.nlm.nih.gov/books/NBK20301/

[2] The projected growth rate of 60+ is currently at <2% in developed countries and is expected to decline to 1% over several years.

[3] Based on UBOS census data of the elderly

[4] State of Older Persons in Uganda, Situational Analysis Report, Ministry of Gender, Labour and Social Development 2020

[6] Remittances as an economic stabilizer (link here)

[7] GSMA 2022

[8] Think tank within the World Bank

[9] The user pays a flat amount for a defined range of amount.

[10] The user pays a flat percentage of the transaction.

[11] Particularly for peer-to-peer

[12] April 16 FX rate of 3714 UGX to the dollar

[14] This is the reduced tax application after a massive public outcry on the original proposal of 1% tax on deposits, 1% on transfers and 1% on withdrawals.

[15] Article IV consultation

[16] Placing a higher percentage of cost burden on the poor compared to other wealth categories.

[17]Research In ICT Article: What happens when you raise taxes on mobile money? The case of Tanzania.