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Payment systems in sub-Saharan Africa

Note 1: Themes and imperatives for national and regional payment systems that enable remittances

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List of acronyms and abbreviations

ACH	Automated Clearing House
AML/CFT	Anti-money laundering and the combating of financing of terrorism
ARTCI	Telecommunications Authority of Côte d'Ivoire
ATM	automated teller machine
BOT	Bank of Tanzania
CBN	Central Bank of Nigeria
CDD	consumer due diligence
CEMAC	Economic and Monetary Community of Central Africa
COBAC	Banking Commission of Central Africa
DMB	deposit money banks
EAC	East Africa Community
EAPS	East Africa Payment System
EFT	electronic fund transfer
GDP	gross domestic product
MNO	mobile network operator
MOU	memorandum of understanding
NACS	Nigerian Automated Clearing System
NCC	Nigerian Communications Commission
NCS	Nigerian Central Switch
NEFT	NIBSS Electronic Funds Transfer
NIBSS	Nigerian Inter-Bank Settlement System
NIP	NIBSS Instant Payment
NPS	national payment system
PASA	Payments Association of South Africa
PCH	payment clearing house
POS	point of service
PSO	payment system operator
PSP	payment service Provider
RTGS	real-time gross settlement system
SADC	Southern African Development Community
SADC RTGS	SADC Real-Time Gross Settlement System
SSA	sub-Saharan Africa
USSD	Unstructured Supplementary Service Data
WAEMU	West African Economic and Monetary Union

1 Introduction

This study is the first in a two-part note series on the state of national and regional payment systems in sub-Saharan Africa (SSA), with the ultimate objective of supporting remittances. It presents a synthesis view of key payment systems themes across the region, drawing on nine national and regional payment system case studies presented in Note 2[1], as well as information gleaned from the Barriers to remittances series[2].

Innovations transforming status quo in SSA payments. The payments landscape in SSA continues to evolve on the back of innovation, development of alternative payment solutions and the entry of dynamic market players (McKinsey, 2014). An increase in low-value, high-volume retail payments has been spurred on by the growing demand for electronic payment services and instruments such as mobile money.

Payment systems unable to fully support innovation. Despite these innovations, the necessary infrastructure, regulation and payment ecosystem do not yet exist to ensure the optimal development of payment services and hence remittances in SSA. Payment systems in SSA that support remittances have developed in an uncoordinated fashion, both domestically and regionally. This has resulted in the absence of a harmonised payment system vision for the region, as well as inefficiencies such as duplication of infrastructure, which is expensive to maintain and often ill-suited to small, underdeveloped economies.

Payment system hampering development of formal remittance channels. Payment systems that enable remittances are the underlying mechanisms that determine much of the formal remittances service offerings and outcomes. As such, inefficiencies described above affect more than just the local payment systems in their respective jurisdictions. They affect the provision of low-cost practicable remittances across SSA.

Developing financially inclusive payment systems that enable remittances. The purpose of this study is to investigate the nature and structure of national and regional payment systems across SSA to identify trends, issues and potential solutions. The study aims to inform regulators, donors and payment system participants in addressing key issues within their jurisdictions. Ultimately, this research seeks to contribute to the development of national and regional payment ecosystems that facilitate modern, efficient and financially inclusive payment systems within the region that are able to support effective access to remittances in line with SDG 10.

The structure of this report is as follows:

- Section 2 provides an outline of the nature of payment systems in SSA at the national and regional levels, respectively. It also provides an overview of the regulatory frameworks in SSA and the principles to be considered to mitigate risks within a payment system.
- Section 3 explores issues faced by payment systems in SSA through a thematic lens. Insights from this section draw from key findings and themes identified in the case studies (Note 2).
- Section 4 draws on the preceding discussion to develop a set of guidelines for national and regional payment system development.

1 The case study countries are Namibia, Nigeria, Madagascar, Tanzania and Côte d'Ivoire. The case study regions are the Southern African Development Communicatee (SADC), the East African Community (EAC), West African Economic and Monetary Union (WAEMU) and Economic and Monetary Community of Central Africa (CEMAC). For each, the strengths and challenges unique to that country or region is discussed. Note one then synthesises common themes across the case studies.

2 Cenfri's "Barriers to remittances" series is a series of seven notes in which we explore the barriers to remittances across different countries in Sub-Saharan Africa. https://cenfri.org/publications/where-are-the-flows/

2 Payment systems in sub-Saharan Africa that support remittances

What is a payment system? A payment system is a set of instruments, banking procedures and interbank funds transfer systems that ensure the circulation of money. It is the means by which funds are transferred within the economy (SARB, 2015). Payment systems do not only entail payments made between banks, but encompass the total payment process, including systems, mechanisms, institutions, agreements, procedures, rules and laws. Payment systems play an important role in helping to maintain financial stability and the reduction of the costs and uncertainty of settlement, which could otherwise act as an impediment to economic activity at the national or regional level (BIS, 2005).

This section provides an overview of the typical structure and nature of national and regional payment systems, drawing on examples from Note 2 to illustrate how payment systems manifest in SSA.

2.1. National payment systems

Essential elements. A national payment system (NPS) encompasses all payment-related activities, processes, mechanisms, infrastructure, institutions and users in a particular country. NPS participants should ideally work towards a vision of how they want their NPS to evolve, taking into account consumer demands and country-specific realities. An NPS involves a multitude of different aspects. These are described below:

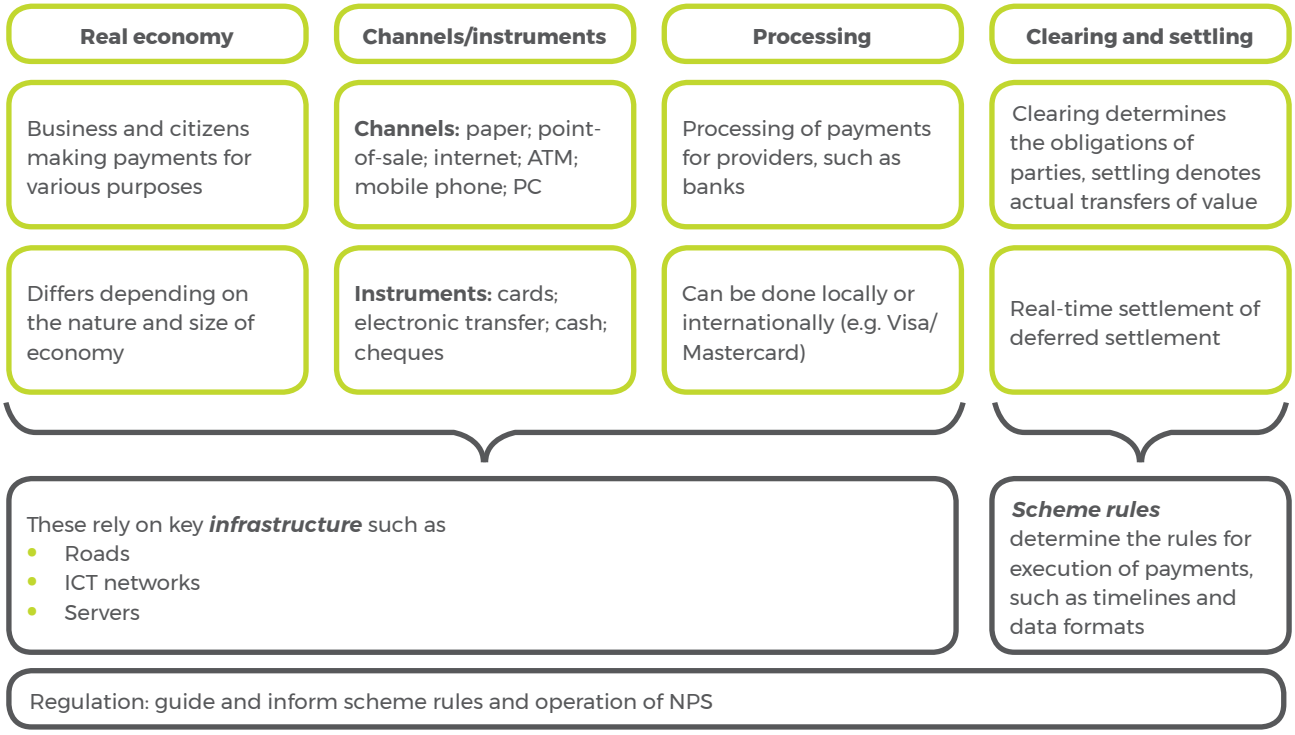
- **Real economy:** Depending on the nature of the economy and society, demand for payments will vary. For example, developing economies with large informal sectors predominantly transact in cash. On the other hand, a more developed economy with a large business sector may need a modernised, digitised payment system.
- **Channels:** Payments can be made through a variety of different channels, such as point-of-sale (POS), paper, internet, ATM, RTGS and USSD. Channels essentially represent the various pathways that can be taken to send money from one entity to another.
- **Instruments:** Channels rely on instruments to effect payments. Some channels have specific dictated instruments (such as cards in the case of POS) while some instruments can function through different channels. Typical instruments include cheques, cash, cards, EFT and e-money. Instruments are essentially the tools used to effect payments through various channels.
- **Processing:** The processing of payment orders involves the sending and receiving of messages for purposes such as payment orders or authorisation requests. Processing of payment orders is done by banks, PSPs or specialised processing payments service providers. Payment orders can be in the form of paper, images, digital messages or bulk files.
- **Clearing and settling:** Clearing refers to the transfer of transactional information that determines the obligations of participating parties. Settling or settlement refers to the actual exchange of value in performance of obligations. Settlement can be real-time (payments are cleared and settled in the same transaction) or deferred (payments are cleared

and then settled at a later stage). Settlement can also be on a net or gross basis. The former is normally done on a deferred basis, whereby participating parties calculate a net position between each other after a processing window of transactions have been netted out. The latter is often done in real time and the gross value is transferred. Real-time settling becomes more critical for larger value, systemically important payments, while net deferred payments tend to be more efficient in the case of multiple, small payments. This is because large value payments tend to carry high risk and it is critical that they be completed successfully. As such, they need to be cleared on a gross basis through a network that has available bandwidth and capacity to process transactions. Low-value transactions carry lower risk and can be settled on a net basis and in batches so that the payment system is not burdened with multiple small payments throughout the day. Increasingly, there is a requirement for real-time clearing at retail level with deferred settlement. This often goes hand in hand with a higher degree of irrevocability to enable merchant or spot payments.

- **Supporting infrastructure:** Payment instruments and channels rely on key supporting infrastructure to operate. Some channels require less supporting infrastructure than others, but most digital channels require a certain level of connectivity and electricity. Examples of supporting infrastructure include, road and transport, online connectivity, power/electricity and the regulatory environment.

The above elements are illustrated in Figure 1. Regulation and infrastructure within the economy play an important role in shaping the development and nature of national payment systems. As such, they are illustrated as foundations for the four payment system elements.

Figure 1: High-level overview of elements of a national payment system



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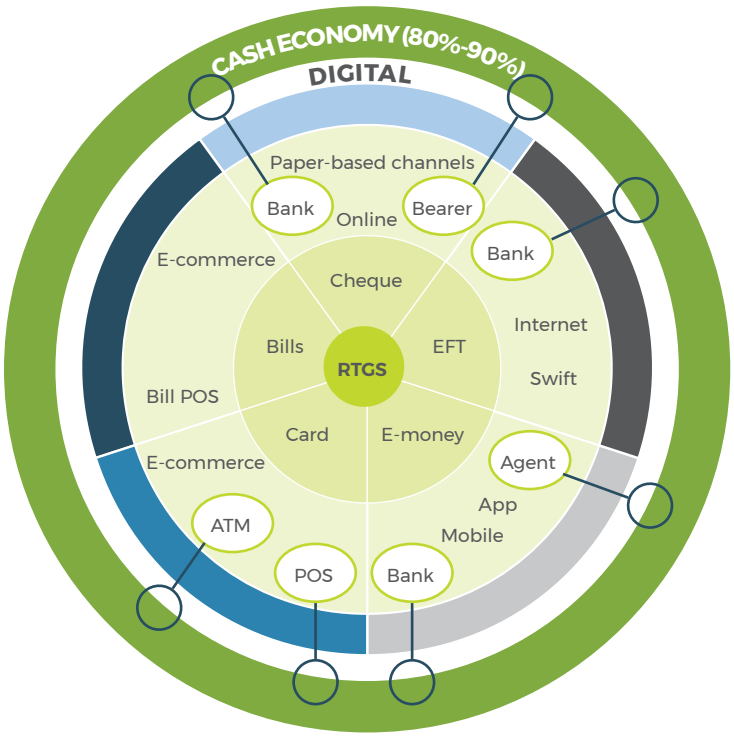
Across SSA, payment systems have developed differently. This is because economies and infrastructure are at different stages of development. Some key insights are highlighted below.

Cash is king, but digital is growing. Across the case studies, cash is still the most used instrument. Other paper-based channels/instruments, such as cheques, have been decreasing in popularity. At the same time, usage of digital channels has been increasing. This is illustrated by rising usage of EFT, POS and mobile channels. For example, in Tanzania the annual value of cheques decreased by 34% between 2013 and 2015 while for POS it increased by 272%. Despite this increase, cash remains the main instrument through which payments are being effected across case studies. Figure 2 depicts the various channels and instruments in SSA and the extent to which these channels are able to interact with the dominant "cash economy".

In the below figure, the RTGS system is the centre of the digital ecosystem. The instruments that can be used to effect payments are represented by the second circle, while the various channels through which these instruments are processed are represented by the third circle. The outermost circle represents the cash economy, where in SSA 80% to 90% of payments are made. As is shown, very few digital channels and instruments touch the cash economy, while only some (those connected with blue hook-points) interact with it at all. For example, the e-money instrument can be facilitated through the agent channel. This pathway interacts with the cash economy because consumers cash-out e-money through agents. As such, the pathway is connected to the dominant cash economy, but not fully, as consumers are generally unable to engage with retailers without first encashing. This puts into perspective the limited scope that digital channels and instruments are having in SSA.

Figure 2: The integration between the cash economy and digital channels in SSA



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Mobile money especially useful in under-developed payment systems. Interestingly, in every country but Nigeria, mobile money has become one of the largest (if not the largest) digital channel in the country in terms of annual volumes. Mobile money seems particularly successful in countries where pre-existing channels and instruments for digital payments are not already well developed, but less so where they are. In Côte d'Ivoire, Madagascar and Tanzania, mobile money is playing a large role in shaping the nature of retail payments. However, in Nigeria it failed to ignite for a number of reasons as discussed in the case studies note.

Methods for processing of payments vary between countries. Some of the case study countries process locally, others process internationally/regionally. The way payments are processed differs depending on the size of the economy and the different channels, as well as the political motives of that country. For example, in Madagascar, card channel payments are processed at international banks located in France, whereas in Nigeria they are processed in-country using locally owned infrastructure. However, the case studies reveal that many African countries do not process payments internationally, preferring to use locally owned infrastructure. This is due to political motivations aligned with nationalism. As such, many countries do not process large-enough volumes to achieve sustainable scale. This is discussed further in Section 3.

Innovation in clearing and settling of payments. All the case study countries have well-developed RTGS systems for instantaneous clearing and settlement of large payments. Moreover, most countries have established deferred settlement of low-value EFT payments. Nigeria has gone even further, establishing a real-time clearing system for low-value EFTs. This shows that there is innovation in SSA. In addition to the fact that systemically important payments can be effectively made (which enhance economic activity), there is a new tendency to lower-value retail and micro payments which can support more economic activity and remittances at the micro level.

2.2. Regional payment systems

The current landscape for cross-border payments in SSA is dominated by correspondent banking relationships. However, as regions integrate economically and promote open trade among member states, maintaining fragmented national payment systems can become a hindrance to larger goals of economic development and cooperation. Regional payment systems are international mechanisms designed to facilitate payments between residents of the participating countries. A multitude of regional payment systems are developing across SSA. These include:

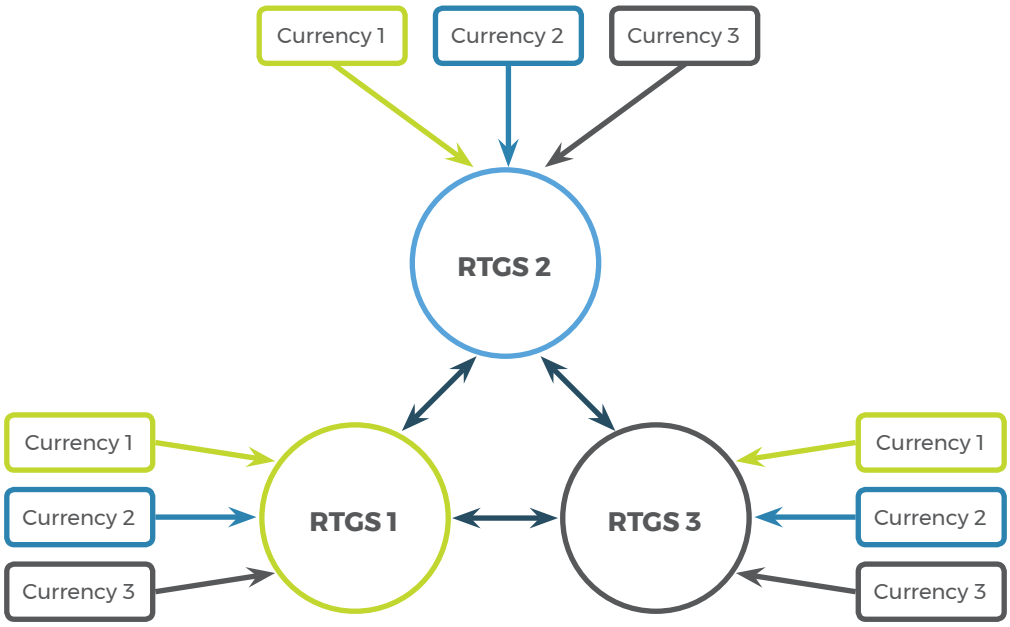
- SADC Real-Time Gross Settlement System (SADC RTGS)
- West Africa Economic and Monetary Union (WAEMU)
- East Africa Payment System (EAPS)
- The Economic and Monetary Community of Central Africa (CEMAC)
- Regional Payment and Settlement System (REPPS)
- Regional SADC Clearing House (RACH)

> Regional payment systems are international mechanisms designed to facilitate payments between residents of the participating countries.

Three SSA manifestations. Regional payment systems can be structured in various ways. Some options are discussed below:

- **Decentralised linking of RTGS systems.** Bilateral links between national payment settlement infrastructures typically aim at supporting intra-regional payments without incurring significant capital costs. For instance, the East African Payment System (EAPS) involves participating member countries which are linked through the holding of reciprocal bilateral accounts with each central bank. This is not expensive to implement because it relies on infrastructure that is already developed (each country's RTGS system). However, bilateral links are not particularly efficient because settlement is in local currencies and requires member banks to hold multiple different currencies at all times. A basic example of this system is illustrated in Figure 3, whereby three different RTGS systems create interoperability by simply linking bilaterally to each of the other RTGS systems in the region.
- **Establishing a hub-spoke regional payment system.** Another way to achieve interoperability between countries is to establish a centralised payments clearing and settling house for the region, which payment system participants (such as banks or PSPs) can then access directly. As shown in Figure 4, on the next page, financial sector participants in each country link directly to a regional processing hub, which clears and settles transactions between the participants. This system is more commonly associated with regional integration projects that have evolved into a monetary union and the use of a regional currency, such as the WAEMU and CEMAC regions. However, The SADC RTGS is also an example of this. For instance, the West African Economic and Monetary Union (WAEMU) has a robust centralised governance structure under the Central Bank of West African States (BCEAO). This has enabled the establishment of a common currency (the West African franc CFA) and development of high-quality shared payments infrastructures for RTGS, automated clearing house (ACH), and card payments

Figure 3: Bilateral regional payments system



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among the member states. At the end of December 2016, there were 118 participants from different member states processing payments through the regional RTGS, the WAEMU Automated Transfer and Settlement System (BCEAO, 2016).

- **Multi-level hub-spoke regional payment system.** Finally, regional interoperability can be created through the linking of national payment systems to a central hub. These systems are designed in a multi-level hub-spoke structure whereby a central administrative and technical-operational facility indirectly links participating RTGS or similar systems. This is different to the model in WAEMU and the SADC RTGS, because participants (such as banks and PSPs) link directly to their respective national payment system, not the regional payment system. As depicted in Figure 5, below, each country's NPS is linked to a central hub which processes cross-border transactions requests. An example of this is the RCH for SADC is designed to process retail payments across the SADC region.

Figure 4: Hub-spoke payment system

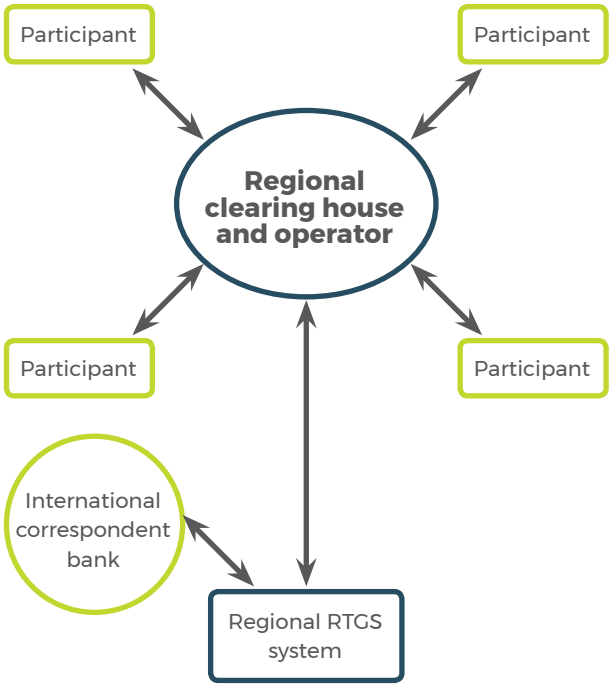

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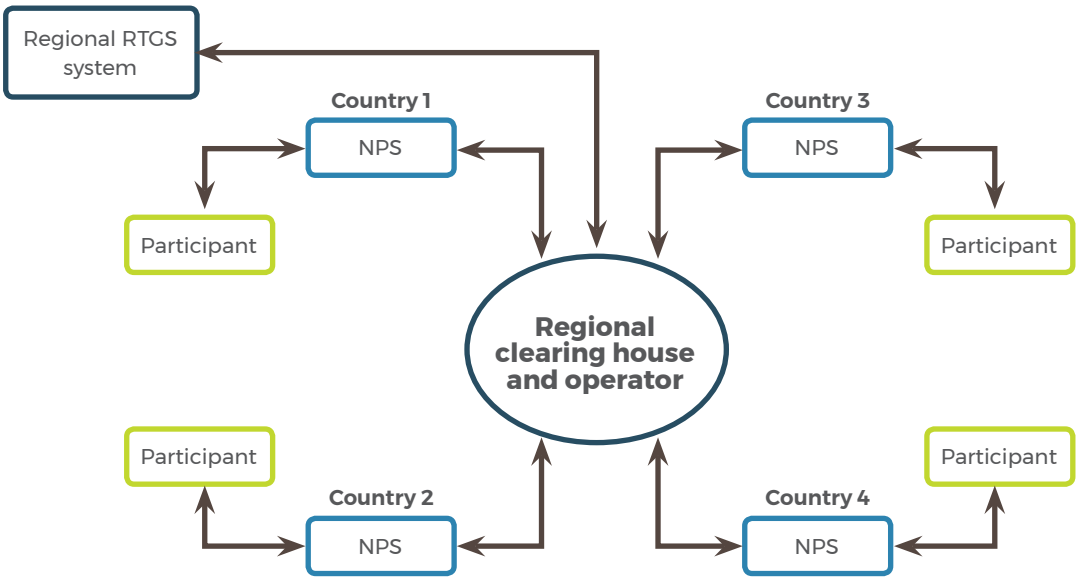
Figure 5: Multi-level hub-spoke payment system.



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2.3. Regulation

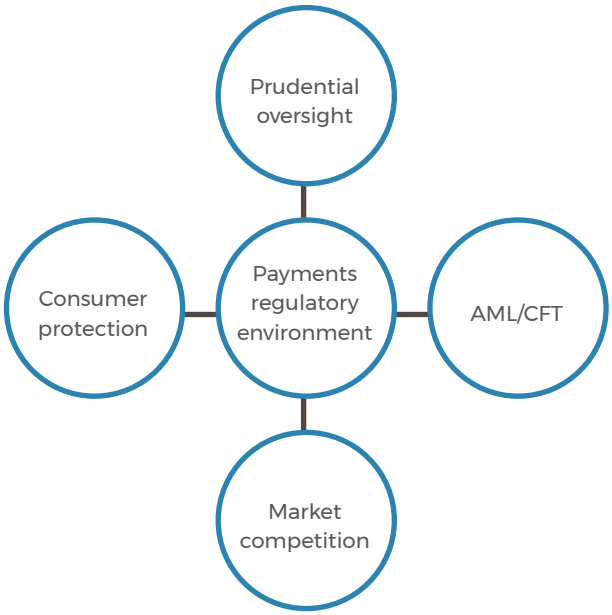
Managing risks while facilitating innovation. The importance of payment systems as social infrastructure means that their continued operation is key to the operation of society. However, payment systems face a number of risks that can potentially derail the operation of the system. Regulation plays an important role in reducing and mitigating risks, thus ensuring the continued sustainable operation of payment systems. These risks are described below.

- **Operational risk.** Operational risk refers to the risk that a payment participant's core infrastructure, systems, governance or network fails or is compromised and is therefore unable to fulfil its obligations under a payment agreement.
- **Credit and liquidity risk.** In the case operational failure does occur, or where a provider is insolvent or unable to meet their obligations, PSPs run the risk of credit or liquidity shortfalls. The former refers to a loss in value as a result of the failure of one of the parties to fulfil obligations, the latter refers to the short-term inability to meet obligations due to liquidity shortages which can affect the clearing and settlement function for that clearing house (BIS, 1993).
- **Systemic risk.** Systemic risk arises when the failure of payments providers results in negative spill-over effects on the rest of the economy. It can result in loss of confidence in the formal financial system and bank runs.
- **Efficiency risk.** If a payment system is inefficient or overpriced then it becomes disproportionately expensive to move money around the economy (Bollen, 2010). This is known as efficiency risk. This could be a result of monopolistic ownership of the market, or of inadequate infrastructure that is not able to support efficiency
- **Consumer protection risk.** This is the risk that consumers will be mistreated or abused in the market due to information asymmetries and poor consumer recourse mechanisms.
- **Financial integrity risk.** Finally, payment systems face financial integrity risk, namely the risk that their systems will be used for money laundering and financing of crime.

The objective of regulation is to reduce or mitigate the above risks as much as possible without stifling market development and innovation.

Four key regulatory areas. Payment system regulation typically encompasses four key regulatory areas as summarised in Figure 6.

Figure 6: Payments regulatory environment



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Lack of regulator clarity leading to uncertainty. Across the case studies, regulation which applies to the payment system, and the four areas identified above, are often contained in various different pieces of legislation. In Madagascar for example, there is no National Payment System Act. This means that PSPs will need to refer to other Acts which are not specifically drafted for the payment system to understand business operation requirements. This can be a challenge and creates uncertainty, which decreases ease of doing business and increases risk. In light of this, the details of these regulatory areas are discussed in more detail below.

Proportional prudential oversight minimises systemic risk. Prudential oversight must be applied to major payments institutes and especially those that are systemically important to the financial system[3]. This would include capital adequacy ratios, liquidity ratios and other prudential requirements (Bollen, 2010). As a general principle, prudential requirements need to be proportional to the level of systemic risk associated with the respective firms and the type of services they are providing. Moreover, they should be directly linked to the specific risk they are mitigating. For example, a deposit-taking institution or bank which processes large transactions with a multitude of linkages, settlement windows and instruments within the economy should be subject to different prudential requirements than a small, single instrument, payment service provider (PSP). Prudential regulations would also set out the licensing requirements for PSPs and set standards for payments providers such as operational and technical standards, finality and revocability of payments as well as other aspects that directly affect risk. They therefore minimise systemic, operational, credit and liquidity risk.

Box 1: Prudential regulation to reduce risk in Nigeria

As discussed in 2.1, the value of the NIPS in Nigeria is its ability to clear low value EFTs in real-time. However, it still settles these transactions on a deferred basis. This means that the multitude of cleared payments throughout the day present a large risk to PSPs and banks. If a system participant fails and is unable to settle its transactions, then transactions throughout the day which were cleared cannot be settled. This introduces credit risk and also liquidity risk, whereby PSPs cannot fulfil payment obligations to customers. The larger the size of the failed participant, the larger the potential ramifications. To reduce this, payments across NIPS are settled in multiple windows throughout the day. This reduces the total amount that could be potentially lost between settlements and clearing windows without being too costly. Establishment of standards regarding settlement times and windows is done in collaboration between regulators and market players. Ultimately regulation plays an important role in accepting and implementing these standards.

3 According to BIS (2001) systemically important payment systems are those whose failure could trigger or transmit systemic disruptions in the financial area because of the size or nature of individual payments which they handle or because of the aggregate value of payments processed

A competitive market environment reduces efficiency risk. Regulation should create a competitive space for payments service providers to operate. Increased competition discourages monopolistic pricing. This in turn brings down the cost of payments processing and encourages market innovation and efficiency. Regulation needs to create a level playing field, while preventing fraud and anti-competitive behaviour, such as collusion and monopolisation. Across SSA, it is often the case that payments markets are dominated by large players, while smaller players struggle for remaining market share. For example: in Tanzania, despite the existence of over 50 banks, more than 50% of the market share is controlled by fewer than five banks. In Côte d'Ivoire, the MNO space has historically been dominated by a few companies which controlled access to the USSD network and denied smaller players access to this network. This has led to market inefficiency. In response, the National Telecommunications Authority (ARTCI) began requiring MNOs to open the USSD channel to external services providers. This allowed for increased competition in the market. Box 2 describes how South Africa implemented regulations to increase competition in its national payment system.

Box 2: Regulating market conduct in South Africa

Recent regulatory developments in South Africa's financial sector provide a very good example of market conduct but also of mandate. In April 2018, South Africa's economy saw the introduction of the Twin Peaks model of financial sector regulation. It creates the Financial Sector Conduct Authority (FSCA) as a new market conduct regulator, as well as a Prudential Authority (PA) responsible for financial soundness within the South African Reserve Bank (Reserve Bank).

This model is designed to streamline interaction between the regulators and the financial services industry, with a more functional approach to regulation and supervision replacing the current industry silo-based approach. This will allow for a more centralised approach to certain supervisory activities (such as licensing) and consolidation of various aspects of regulation governing the financial services industry to remove duplication and improve efficiency. By changing the mandate around the national payments function from essentially promoting banking and operational focus to a more consumer-centric and market conduct view, this regulation provides a platform for achieving competitive, efficient and sustainable financial market equilibrium.

Source: FSB (2014)

Transparency reduces consumer protection risks. Reducing consumer protection risk requires that regulation sets out the way product information is disclosed to consumers. Typically, a best-practice regulatory regime will require that payments providers make every effort to ensure that customers understand the products they intend to purchase (Bollen, 2010). It should also set the procedures for lodging complaints, complaints handling, risk apportionment and the extent to which personal data (such as financial identity data) can be used. The World Bank (2016) states that FSPs should have clear written complaints procedures as part of their Terms and Conditions. Privacy laws that regulate the use of sensitive personal data, such as identification data or financial data, are either set in standalone privacy legislation or contained with financial sector regulation. Privacy laws should clearly set out who is responsible for privacy leaks and what the penalties will be for such leakages. The outcome of the consumer accepting these risks can be a lower overall price and efficient scalable service as opposed to an unaffordable risk-free system.

In SSA, consumer protection legislation is often not present, or it is not detailed enough. Key redress mechanisms are often not laid out explicitly. Consumers therefore lack trust in formal financial services, leading to dependency on cash. In Madagascar for example, a national consumer survey has shown that individuals do not trust formal financial services. One way to reduce these issues is to structure the mandate of the regulator such that it emphasises consumer protection. For example, the Bank of Tanzania is the overseer of the NPS in Tanzania, and it is mandated to be a guardian of public interest. This incentivises BOT to ensure that consumers are not mistreated in the system and that disputes are handled through an accessible and transparent process.

A regulatory approach to facilitate inclusive integrity. To ensure that payment systems do not affect financial integrity, countries need an anti-money laundering/combatting the financing of terrorism (AML/CFT) legislative framework. Among other things, this legislation details the extent to which FSPs (including payments providers) need to understand the identity of their customers to help detect and monitor potential financial crimes. This is known as the consumer due diligence (CDD) aspect of anti-money laundering (AML). Across SSA and many other parts of the world, CDD measures are sometimes implemented in a manner that leads to financial exclusion. This is because consumers are often unable to prove their identity and therefore cannot access financial services, even if they pose a low money-laundering risk (Cooper et al., 2018). While this remains the case in most case study countries, some have started to implement tiered CDD requirements to reduce exclusion. Notably, in Nigeria, KYC is tiered according to low, medium and high-value accounts. These tiers apply to accounts with commercial banks and mobile money accounts. The identification requirements for low-value accounts are lower than the requirements for medium and high-value accounts. For example, Tier 1 accounts do not require a BVN number (a centralised biometric identity system), whereas medium and high-value accounts do. Moreover, the identification information supplied by a Tier 1 customer does not have to be checked against a database and verified, whereas it does for medium and high-value accounts. Each tier is subject to different transaction limits and account types.

3 Key payment system development themes in sub-Saharan Africa

This section takes a thematic approach to unpacking the issues faced by payment systems development in sub-Saharan African (SSA). Based on the insights from the case studies described in Note 2, we identify three cross-cutting themes that are important to the development of payment systems at a national and regional level:

- The importance of scale
- The importance of fit-for-purpose payments system infrastructure
- The need for regulation that mitigates risk while promoting innovation

For national payment systems, a fourth theme is identified, namely the need for sufficient supporting infrastructure to facilitate NPS development (be it roads, electricity, ICT or banking systems).

The sub-sections below explore these themes at the national and regional payment system levels, respectively.

3.1. National payment systems

3.1.1. Scale: ensuring a sustainable business case for payment systems development

Achieving scale is crucial for sustainable, profitable payment systems. High cost is one of the primary barriers to accessing digital payment services. The only way to drive down cost while maintaining a viable business case is to increase scale. A high volume of payments is needed to justify the business case for investing in expensive infrastructure and to ensure that costs remain low enough for digital payments to be affordable for consumers.

Digital payments growing in scale, but still hamstrung by cash preference. Usage of digital payments is increasing across SSA. Mobile is growing particularly fast and is becoming systemically important in some countries by providing a way to leapfrog poor pre-existing payment systems infrastructure. In Tanzania, for example, the value of mobile payments in 2015 was over USD20 billion, more than any other channel/instrument. However, mobile money is not yet achieving its full potential, because most consumers still pay for products in cash. For example, in Madagascar, Thom et al (2017) find that 99% of people's expenses are paid in cash. Thus, as suggested in Making Access Possible synthesis note "Cash is King", increasing uptake of digital payments requires the availability of sufficient cash-in and cash-out points until such time as the full payments ecosystem is digitised (Bester et al., 2016). This will be a gradual process that cannot only be solved by digitising the last mile of the value chain. In the meantime, the scope for digital payments to reach scale will remain hamstrung.

Interoperability is important for achieving scale. Interoperable payment systems enable the seamless participation of multiple proprietary payment acceptance and processing platforms, and different payment products. This promotes competition and efficiency gains by enabling economies of scale (W3C, 2014). A critical mass of service providers must be interoperable to fully unlock the network effects of interoperability and thus the benefits of scale. There are two ways to achieve interoperability:

- **Mandated approach:** Interoperability can be mandated by the regulator
- **Industry-led approach:** Private-sector players can decide to become interoperable among themselves

Mandated approach levels the playing field. Mandated interoperability has the scope to increase scale, while levelling the playing field and creating efficiency through a common standard. For example: in Nigeria, all payment service providers including commercial or deposit money banks (DMB), private switches, fintechs providing payment service solutions and mobile money operators are required by the Central Bank of Nigeria (CBN) to connect to the Nigerian Central Switch (NCS) (EFInA, 2017; Central Bank of Nigeria, 2010). Although there was initial resistance to the national switch due to the perceived loss of competitive advantage (Komolafe, 2011), this has since been overcome. Usage of the NCS has grown rapidly over the years, with payments valued at USD171 billion (NGN62 trillion) processed through the switch in 2016 (Okwe, 2017).

Industry-led approach requires sufficient buy-in to ensure scale. Tanzania offers two examples of industry-led interoperability. It shows that, for such an approach to work, sufficient buy-in across the industry is required:

- Tanzania's industry-led approach to ensuring interoperability in mobile money is a notable success story (CGAP, 2015). Rather than mandating interoperability at a regulatory level, a common set of standards and principles for the operation of mobile payments was formulated by industry. This gave market players the option to adopt these newly formed standards and establish bilateral relationship with other market players. The common standards were formulated by the market players themselves, through debates, negotiation and collaboration facilitated by working sessions. The process was funded by the Bill & Melinda Gates Foundation. Not all the mobile money providers in Tanzania's market ended up adopting the new standards, but enough of the largest MNOs, such as TIGO and Vodacom, did. This has increased the adoption of digital payments, as money can now be easily transferred between different mobile network operators (IFC, 2016).
- Tanzania's card market attempted to create interoperability through the establishment of a private switch known as Umoja. The Umoja Switch was established in 2006 as a consortium of smaller banks. Its aim was to provide shared infrastructure for small banks to allow them to reach a profitable scale by leveraging off each other's infrastructure. Despite having as many as 27 banks connected to the switch, the largest banks in Tanzania are still not members of the Umoja Switch. As a result, the switch does not process large-enough volumes of transactions to achieve scale (CGAP, 2018). Without scale, the price of transactions remains relatively unaffordable for many consumers. According to CGAP (2018), card switches should cost between USD0.02 and USD0.06 to be affordable. However, the Umoja switch costs consumers USD0.22 per transaction.

Cooperation in infrastructure development promotes interoperability and scale.
The importance of interoperability for scale suggests that essential market infrastructure, such as real-time settlement, clearing and national switching systems should be in the cooperative space[4] of the market. Sharing the cost of payment-processing services such as clearing and switching allows PSPs to compete on providing better services to clients, as opposed to relying on infrastructure to create a competitive advantage through functional disadvantage or exclusion of lower-tier banks and PSPs.
For instance:

- With the Umoja switch in Tanzania, where PSPs link into a common switch, smaller service providers can leverage the network of larger players to expand the reach of their services to a wider market, as opposed to having to build their own infrastructure.
- In the Nigerian payment sector, the Nigerian Inter-Bank Settlement System (NIBSS) plays an integral role in facilitating cooperation in the competitive space, while driving innovation and efficiency in the non-competitive space of the country's NPS. NIBSS's mandate is the development of the Nigerian NPS, with a particular focus on retail payments[5]. NIBSS operates the Nigerian Automated Clearing System[6] (NACS) and Nigerian Central Switch (NCS). The NCS facilitates interoperability between the various players in the financial system. NIBSS is owned by all licensed commercial banks and the CBN[7]. The benefit of the type of ownership structure is that there is regulatory oversight over the operations of the most strategically important elements of the NPS, which ensures that a market development mandate is pursued. Furthermore, there is buy-in from private-sector payment service providers, who have the best view of how the NPS should be designed to best suit the needs of the market. The equal share ownership among commercial banks means that larger banks do not have undue influence over how NIBSS is operated. However, NIBSS's board representation is determined by the value and volume of payments; the top four banks by value and volume of payments are represented on the board. This representation is revised every five years (NIBSS, 2018).

Ubiquitous channels the next frontier to low-cost scalable payment systems. Interviews with stakeholders suggest that there is a move towards ubiquitous systems using the same ISO messaging type. This holds a lot of potential to scale up both at financial service provider, national and regional levels and could significantly reduce costs, risk and legacy interoperability issues for the payments services industry. Interoperability allows distinct channels which run on essentially different instruments to interact and create the perception of ubiquitous instruments, but they are not truly interoperable without intervention. On the other hand, ubiquitous channels arise where the core processor and instruments are the same and where the individual channels distribute those instruments in slightly different ways. This type of initiative is in its nascent stages but holds strong potential to create scale in the future.

4 In payment system parlance, the "cooperative space" or "non-competitive space" refers to shared infrastructure among market participants, such as a central switch, while the "competitive space" refers to proprietary infrastructure, such as branches or proprietary ATM. Interoperability broadens the cooperative space.

5 The Nigerian payment system supports a wide variety of payment channels and instruments such as cash, cheques, electronic funds transfers (EFT), NIBSS Instant Payments (NIP), NIBSS Electronic Funds Transfer (NEFT) Transactions, ATM, POS, mobile payments, internet (Web) transactions, international payments (SWIFT) and RTGS.

6 NACS is the automated clearing system of the entire banking and financial industry for both electronic instruments (NEFT) and derivatives/image paper-based instruments (cheques).

7 The Board consists of the Deputy Governor (Operations), Central Bank of Nigeria, as the Chairman and Representatives of the stipulated Banks.

3.1.2. Fit-for-purpose payment system infrastructure

National payment systems should be fit for purpose. Given the importance of scale in achieving sustainable payment systems, it is important that payment systems are fit for purpose for their specific jurisdiction and local conditions. For example, if there is very low demand for card-based payments, then it would not make sense to install a state-of-the-art switch for card payments in the country. On the other hand, a high demand for EFT and mobile payments needs strong connectivity and mobile penetration. It would therefore be important to install telecommunication infrastructure and establish local clearing and settling for these channels.

Countries in SSA often driven to localise payment systems. Some countries have large populations and therefore have possibilities of driving scale. For example, Nigeria is the most populous country in Africa, meaning that it has a huge domestic market for all kinds of goods and services, including payments. However, many countries in SSA do not have large populations and therefore have small domestic markets for payments. Despite this, across SSA we note that small countries, such as Mozambique, Swaziland and Malawi are often committed to establish their own processing, clearing and settling system. This is normally due to the desire for sovereignty or because they have received funding to do so or even that the establishment of a switch is a requirement contained in a country debt instrument.

Analysis of stakeholder discussion surmises that this often results in the installation of payment systems which are not fit for purpose, because the market scale and development path cannot yield the volumes required to justify the existence of a local system. The viability of local systems requires a quick installation and market development period. This is incongruent with implementation periods up to a decade due to insufficient capacity and only nominal vendor support.

Leveraging the scale of neighbouring countries can keep costs down. Some countries have taken measures to ensure that their payment systems are fit for purpose despite localising them. For example, Namibia has managed to maintain a highly developed and well-utilised NPS despite having a small population of only 2.5 million people. To achieve this, the national payment systems operator (PSO), Namclear[8], chose to lease infrastructure from BankservAfrica[9] to keep switching and clearing costs down. Namclear's leasing arrangement allowed the Namibian NPS to have the best of both worlds. They managed their own risk by localising their strategically important payments infrastructure, while leveraging the scale of an operator such as BankservAfrica to process these transactions, therefore keeping processing costs low[10]. Nambia installed its own processing capacity in 2011 to fully localise payments. However, it now utilises efficient infrastructure which has low operating costs and is therefore still relatively cost-effective.

8 Namclear is the authorised Payment Systems Operator (PSO), settlement and clearing agent of the Bank of Namibia (BON)

9 BankservAfrica is a payment clearing house (PCH) systems operator (PSO) based in South Africa (SA). BankservAfrica is authorised by the SA payment systems management body, Payments Association of South Africa (PASA), to provide the banking industry with critical payment infrastructure and is a financial market infrastructure service provider (BankservAfrica, 2018).

10 BankservAfrica is the appointed SADC RCH (Regional Clearing House) Operator.

Processing and clearing internationally can be more cost-effective than establishing a local switch. Other countries have opted to rather process payments internationally or regionally where limited demand exists. In Madagascar, the demand for card-based payments has historically been very low (Thom & Weideman, 2017). As such, Madagascar processes and clears its card transactions via an operator in France. The banks in Madagascar each has relationships with a bank in France. This bank then acts as a central hub for processing and clearing transactions between Malagasy banks. Given the low number of card transactions, this is fit for purpose in Madagascar as it allows for safe processing and clearing of transactions without installing expensive infrastructure.

3.1.3. Regulation: managing risk while enabling innovation

Regulatory certainty is vital. As discussed in Section 2.3, regulation is the cornerstone of payment systems development. It is important for the rules of the system to be clear to new entrants and to encourage innovation in services and products. If these rules are not clear, FSPs will be discouraged from investing in innovation as it may be perceived to be risky, thus preventing market development. For example, in Nigeria many stakeholders cited lack of regulatory clarity and cooperation as the cause for lack of development in the mobile money market. According to Access to Finance in Nigeria survey data (EFInA, 2016) uptake of mobile money among Nigerian adults is only 1%. Until recently, MNOs were barred from becoming payment service providers because of a lack of coordination between the Nigerian Communications Commission (NCC), which regulates the telecommunications sector and the CBN, which regulates the national payment system. Given that regulators believe that a firm could not be regulated by two entities, this left MNOs, which had the reach, infrastructure and institutional knowledge of providing mobile money services, locked out of the market. This obstacle was recently overcome when CBN and NCC signed a memorandum of understanding (MOU) allowing MNOs to create special-purpose vehicles which can be regulated by CBN and provide payments services, such as mobile money (Nigerian Communications Commission, 2018).

In Cenfri's Barriers to remittances series (2018), fintech companies note that a substantial proportion of their development capital is spent dealing with opaque compliance requirements and unsustainable regulatory delays. This means that much of their resources are drained from innovation and apportioned to compliance matters. This, coupled with how long it may take for regulatory decisions to be made, significantly affects the number of innovative fintech startups which are eventually successful.

Innovation challenges regulators' ability to keep up. The payments sector, and the financial market as a whole, is a fast-changing environment. In the age of inter-ledger protocols, cryptocurrencies, digital fiat currency and tech companies such as Amazon and Google providing financial services, it is increasingly difficult for regulators to keep up with these advances. Given that many regulators have a mandate to manage risk in the economy and implement sound monetary policy, innovation either falls out of this mandate or is directly at odds with it. This often results in regulators in SSA either ignoring the risk and turning a blind eye to innovation or banning some of these innovations until they can understand how they work and how they need to be regulated. Across SSA, new technologies such as mobile money tend to have failed where the regulations were strict. Where the regulatory approach was more flexible and responsive, success was more likely (Evans and Pirchio, 2015).

A "test-and-learn" approach may create room for innovation. A typical way for implementing regulatory flexibility in SSA is through a so-called test-and-learn approach. For example: the Bank of Tanzania (BOT) allowed mobile money service providers to operate by partnering with a bank despite not understanding the potential risks of mobile money. BOT then issued letters of no objection to the partner banks to state that mobile money products were still subject to oversight as well as regulatory requirements for provision of services (GSMA, 2014). As such, despite a comprehensive regulatory framework for mobile money being absent, operators could provide mobile money services. The central bank took an oversight role and monitored the growth of the market. Thus, the BOT used the test-and-learn approach to let regulation follow innovation and support financial inclusion while managing risks (GSMA, 2014). When a test-and-learn approach is implemented in an ad hoc and opaque way, however, it may create an unlevel playing field that is not conducive to innovation in the long run (Hougaard et al., 2017).

3.1.4. Supporting infrastructure

Supporting infrastructure refers to country and financial sector infrastructure outside of direct payment system infrastructure that is relevant to the development of the payment system.

Lack of supporting infrastructure a key constraint. Payments channels rely on supporting infrastructure for processing and settling. For example, in order to make card payments you need card machines, ICT networks to send messages, and servers to process these messages. Moreover, electricity and road infrastructure is needed to manage branch and ATM networks and conduct effective cash reticulation. It is clear from the case studies that this supporting infrastructure is often lacking in SSA, and this hamstrings the extent to which channels can grow. For example, in Madagascar the road and transport network is underdeveloped, making it difficult to reach encashment points for providers and consumers. Since cash is paramount in this economy, the difficulty in reaching ATMs limits the utility of bank accounts for consumers. Moreover, underdeveloped ICT network coverage hampers the development of electronic payments across the case study countries. Despite this barrier, mobile money has grown significantly across most case studies. This is likely due to high mobile phone penetration rates and the use of legacy technology, such as USSD, for mobile money transactions.

Underdeveloped processing systems limiting interoperability and increasing cost. Private-sector payments providers, particularly banks, often do not prioritise the upgrading of their core payments processing infrastructure. This means that they are often hamstrung by legacy systems which work according to old operating standards and do not work with newer, more efficient standards. This limits service offerings and the extent to which banks can work with correspondents. In some cases, such as South Africa, this necessitates the use of integration layers[11] to ensure that PSPs are able to integrate with modern architecture. However, these layers are expensive and would not be necessary if banks and PSPs kept modern, up-to-date payments infrastructure which could operate with newer technologies. For example, in MAP Malawi, MAP Mozambique and MAP Zimbabwe[12], it was found that some banks and MFIs had legacy core infrastructure which required costly integration layers to interact with more contemporary payments platforms. They were ultimately locked out of the market as they were unable to afford those layers.

11 Integration layers create a platform which connects banks whose infrastructure are not inherently compatible. This allows messages and payments to be processed between these banks.

12 The Making Access Possible (MAP) programme is a research series conducted by UNCDF, FinMark Trust and Cenfri which analyses the financial services sector from a financial inclusion perspective.

3.2. Regional payment systems

Although there is a great deal of overlap between the issues faced by payment systems at a national and regional level, there are some important differences which warrant a separate discussion on how the four identified themes play out at a regional level.

3.2.1. Scale: ensuring a sustainable business case for payment system development

Scale also important for viability of regional payment systems. Much like domestic payment systems, regional payment systems require scale to be cost-effective and self-sustaining. The SADC RTGS is an example of a cross-border settlement service that achieves scale. In 2014, the first year of full operations since its inception, about 90,000 cross-border payments were processed through SADC RTGS, with a total value of about USD50 billion. By 2017, this had increased to 320,000 transactions processed that year, valued at USD101 billion. This scale was possible because economies in the region are relatively large and because there was a high pre-existing demand for intra-regional trade payments.

Limited intraregional trade results in underutilised infrastructure. Although regional payment systems are often built with the purpose of encouraging intra-regional trade, a lack of existing regional trade can leave the system underutilised. This makes it difficult to recoup costs, leading to efficiency losses. The East Africa Payment System (EAPS) was established to provide a backbone for the promotion of intra-regional trade in East Africa. While it does provide an option for affecting intra-regional trade payments, it has not been extensively used by payments service providers (PSPs) in the region. According to stakeholders interviewed, this is because multinational banks already have well-established correspondent banking relationships in the region. Furthermore, the demand for intraregional payments is quite low due to the pre-existing low levels of intraregional trade. As such, EAPS is not highly utilised.

Smaller countries may be able to use regional payment systems infrastructure to leverage scale for domestic retail payments. As discussed in Section 3.1.2 it is not always viable for smaller economies to invest in their own NPS infrastructure. However, if regional retail payment-processing infrastructure exists, which smaller countries can link into for domestic payments processing, this will allow them to leverage this scale and keep the cost of processing down. This is the case in Côte d'Ivoire, whereby the regional central bank (BCEAO) for the WAEMU region processes all transactions in the region, including domestic transactions of each country. Rather than each country processing a limited number of transactions, payments are cleared and settled regionally to ensure scale.

3.2.2. Fit-for-purpose payment system infrastructure

The need for scale means that there is no one-size-fits-all regional payments infrastructure. What systems are implemented depend on the reality of the region.

Dedicated regional payment system infrastructure suited to high-traffic environments. SADC RTGS is an excellent example of a well utilised, fit-for-purpose regional payment system[13]. It makes higher-value cross-border payments efficiently by removing the need for expensive correspondent banking relationships for settlement between participating SADC banks. This has meant that payments are cleared and settled faster, that competition among banks has increased and that settlement risk is reduced because central bank money is used for settlement (SADC Banking Association, 2013).

13 Refer to Note 2 of this series for more detail on why and how SADC RTGS was developed, and more details on its operations.

Low-cost infrastructure for low-traffic environments. Although it is noted above that EAPS is underutilised, it should be noted that EAPS was not expensive to implement. Referring to Section 2.2, EAPS created regional interoperability by linking each existing RTGS in the region to the other RTGSs in the region. This does not involve significant capital cost and is therefore relatively cheap to implement. As such, although the system has not been able to achieve scale, it is fit for purpose because it was not expensive to establish. As intra-regional trade increases in the region, it is likely that the system will see more use.

Insufficient infrastructure to meet demand for retail payments. Regional payment systems have generally been set up to stimulate and support regional trade for larger payments types, like RTGS payments. Apart from WAEMU and CEMAC, where the region has one central bank, cross-border retail payments are not available through these systems. Rather, cross-border payments are made through traditional channels, such as MTOs, MMOs, and cash transfers. According to stakeholder discussion, cross-border payments in the EAC region are hamstrung by the fact that there is no regional system for processing smaller payments. As such, the EAPS system alone cannot cover the demand for cross-border payments.

Limited NPS development likely hindering regional payment systems integration. One of the key barriers to regional payment system development is the varying levels of NPS sophistication between different countries within a single region. Although the West Africa Monetary Zone (WAMZ) was not covered as a case study in Note 2, it is a good example of this issue. In WAMZ, the goal of a common currency, central bank and integrated payments infrastructure remains unachieved due to the disparate levels of NPS development among member states. At the onset, only two of the six countries in the region (Nigeria and Ghana) had modern domestic payment and settlement systems. This prohibited the harmonisation of institutional and infrastructural standards between the respective systems. Subsequently, the other four countries (The Gambia, Sierra Leone, Guinea and Liberia) invested in modern domestic RTGS and low-value payment systems to enable interconnection within WAMZ. Upon completion of the upgrades to the respective NPS infrastructure, all six member countries will be in a position to interlink their domestic payment systems, thus enabling faster and more efficient cross-border payments in the region.

3.2.3. Regulation: clearly demarcating mandates

Clear delineation of regulatory jurisdictions can support regional payment system integration. Delineating the mandate of regional versus national regulation is important when integrating national payment systems into regional ones. For example, CEMAC has a complex regulatory structure whereby both regional and national regulation apply to countries within the region. There is a regional central bank, a regional banking sector regulator (COBAC), as well as country-specific regulation. Although COBAC sets financial services regulation for the region, other regulations, such as data protection and consumer protection regulation, are set nationally and may overlap or conflict with each other. This has resulted in inefficiencies that incur added costs to operations and discourage consumer participation through formal payment channels in CEMAC. This is also an issue in WAEMU, where stakeholders noted that overlapping privacy regulations make it difficult for PSPs to comply.

4 Imperatives for developing payments rails for remittances

In sub-Saharan Africa, where access to formal financial services is still low and prices are relatively high, reaching scale is a vital objective for countries and regions. Achieving scale would bring the cost of formal payments (and ultimately remittances) down and result in greater usage and access to these services. There are a multitude of development pathways or implementations that can lead to scale:

- **Reform national to regional payment systems.** Linking into regional payment systems, as is the case in Côte d'Ivoire and the WAEMU region, can increase the scale of transactions processed by a central hub, making it commercially viable for low-value retail payments. It also reduces cost for individual countries that do not need to establish their own infrastructure to process country-specific transactions.
- **Mandate interoperability or provide support to industry-led interoperability initiatives.** Interoperability within and between channels unlocks scale by allowing for the processing of larger volumes. Across case studies, interoperability has assisted in unlocking the scale of different channels. Interoperability can either be mandated through legislation (as in Nigeria) or it can be adopted by industry through an industry-led approach.

- **Create ubiquitous channel infrastructure.** Rather than creating interoperability between channels, countries or regions could go a step further by creating a common processing platform that processes volumes across all payment channels, thereby creating significant scale from existing activity. See section 3.1.1 for a detailed explanation of ubiquitous channels.
- **Mandate adoption of specific technical standards.** To process bilateral payments without requiring expensive integration layers, private-sector players need their core architecture to be modern and comply with similar standards. Where feasible, countries should consider mandating that PSPs comply with standards such as ISO20022.
- **Cognisance of supporting infrastructure.** The case studies show that in order for digital channels to grow and achieve scale they need supporting infrastructure, such as roads, internet and electricity. In adopting policies, regulation or any market intervention, there is a need to be acutely aware of the supporting infrastructure required for each of these initiatives to successfully develop. It is vital to adopt processes or recommendations that are congruent and practicable within the jurisdiction given infrastructural constraints. For example, relying on, or developing, card and POS networks where there is limited connectivity and poor road infrastructure is unlikely to succeed at scale.
- **Prioritise digitisation of whole value-chain to realise potential of digital.** Currently, digital is growing in SSA but it is still mainly P2P focused and is hamstrung by the need to use cash for most payments. Countries and regions should focus on the return flow of consumer digital value through value chain digitisation as opposed to isolated actor digitisation and heavy reliance on encashment. For example, currently mobile money is taking off in many countries, but its impact is limited by the fact that consumers need to encash mobile money to pay for services and goods. By digitising the value chain (enabling the purchase of goods with e-money or mobile money), the cash barrier is reduced and digital's value can be fully realised.

- **Ensure payments regulator has a mandate for consumer protection.** Noting the distrust of consumers across SSA in formal financial services, it is important that robust consumer protection measures be put in place to ensure consumers are treated fairly and that trust is developed over time. This can be incentivised by making consumer protection a mandate of the regulator.

Not all countries have the same context or can immediately implement the above-mentioned imperatives. This is where the concept of "fit for purpose" becomes relevant to each country or region. Each country will have to delineate its own pathway to scale that fits its local context. Elements to consider include:

- **Size of economy and population.** Large economies can justify local processing, but smaller economies may consider international processing or linking into regional hubs.
- **Political and economic context.** Whether or not regional integration can be achieved will also rely on the political context of the country concerned and the extent of its linkages with neighbour countries. If integration is feasible and possible, then the option is more realistic. Countries should endeavour to develop their national payment systems to a point where integration with neighbour countries is feasible.
- **Nature of payments ecosystem and demand.** If the payments ecosystem of a country involves mostly retail payments, and demand for this is growing, then it is important to develop these channels. However, if it is mostly wholesale payments, then payment channels that facilitate effective trade and business payments will need to be prioritised. Essentially, countries can consider prioritising specific channels that are highly utilised and where demand is likely to continue. This can have greater impact than modernising and developing channels that are rarely used.
- **State of integration between service providers.** Countries should assess the extent to which service providers are already working together or are willing to work together. Any industry-led interoperability initiatives that already exist should be supported. If none exist and smaller players are suffering from infrastructural constraints, then mandating interoperability should be considered.
- **Status quo of infrastructure.** Countries and regions should assess current infrastructure in place and identify key gaps that constrain development of digital payments. Countries can also identify clear opportunities for low-cost infrastructure implementations that have high impact. For example, if mobile money is growing, it may make sense to upgrade telecommunications infrastructure and extend coverage.

Assessing the status quo to ensure smoothest pathway to modernisation and development of payment systems. Based on the above recommendations, regulators and decision-makers should assess the current situation of their payment systems and determine the right pathway of development. Investments that are made without considering the above imperatives can ultimately have low impact despite being costly. Moreover, they can lock countries into development pathways that are not fit for purpose and impact on future developments.

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Payment completed

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About Cenfri

The Centre for Financial Regulation & Inclusion (Cenfri) is a global think tank and non-profit enterprise that bridges the gap between insights and impact in the financial sector. Cenfri's people are driven by a vision of a world where all people live their financial lives optimally to enhance welfare and grow the economy. Its core focus is on generating insights that can inform policymakers, market players and donors seeking to unlock development outcomes through inclusive financial services and the financial sector more broadly.

About FSD Africa

FSD Africa is a non-profit company that aims to increase prosperity, create jobs and reduce poverty by bringing about a transformation in financial markets in sub-Saharan Africa (SSA) and in the economies they serve. It provides know-how and capital to champions of change whose ideas, influence and actions will make finance more useful to African businesses and households. It is funded by the UK Aid from the UK Government. FSD Africa also provides technical and operational support to a family of 10 financial market development agencies or "FSDs" across SSA called the FSD Network.