

G:ENESIS
UNLOCKING VALUE

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Scalable, affordable and accessible?

Building interoperable payment systems that promote financial inclusion in East AFRICA

1. INTRODUCTION

Payments in the East African Community countries are mainly defined by two distinctive ecosystems, the formal banking and mobile money banking systems. Historically these two markets have been separated with limited interoperability. However, in the past 7 years, there has been an increased demand for interoperability and regulators are also increasingly demanding that payment providers connect with each other to drive interoperability and financial inclusion.

Genesis Analytics (Genesis) was commissioned by the Consultative Group to Assist the Poor (CGAP) a part of the World Bank, to study the **payments infrastructure in East Africa**. The study aims to understand how existing infrastructure may facilitate an increasingly integrated regional financial services market by mapping out the domestic and cross-border retail payments landscape in the region.

The project objectives are to i) provide an **overview** of the payments landscape in East Africa and to explain the state and functioning of the ecosystem for domestic and cross-border payments in each country; and ii) to explain the role of infrastructure providers in payment, clearing and settlement services across the region. The findings of the project should assist market participants, regulators and development partners in **nudging the ecosystem to one that supports the broader objectives of financial inclusion**, namely that the poor should have access to **affordable financial products** that are used to enhance their livelihoods, while recognising the contribution that regional integration plays in supporting economic growth and improving those livelihoods.

This study focused on five out of the six EAC member countries, namely, Kenya; Tanzania; Uganda; Rwanda and Burundi, and included both desktop and in-country interviews. Country interviews were completed in Kenya, Tanzania, Uganda and Rwanda. We would like to acknowledge and thank the CGAP team for their support and participation in the project.

2. APPROACH

Our approach to the assignment is to analyse the various domestic and international retail payment streams (card payments, cheques, mobile money services, electronic fund transfers (EFT), and international money transfers) across the countries of focus. We have grouped these payment services into domestic and international, push versus pull payments, and the sources of funds.

For each stream, we have analysed the payments landscape by considering key participants in the payments value chain - from the sending institution to payment aggregators, to clearing and switching, settlement, and receiving institutions, and the different institutions that provide these services in and between each market.

We have also tried to estimate the volume and value of payments processed by each part of the value chain, based on desktop research and interviews with market participants. This is key to the analysis as will be explained in the following section. A list of stakeholders consulted is presented in the annexe.

3. CONCEPTUAL FRAMEWORK

Payments systems, be they domestic or international, create value for the users of payment services when they **operate at scale** and are able to provide payment services **at very low cost**. One of the reasons why in advanced markets electronic payments are growing more rapidly than cash payments is that the cost to the users (individuals and businesses) of the use of such services is very low.

There are considerable **infrastructure costs both hard and “soft” costs** that go into the delivery of payment services. These hard costs include the cost of the “front end” infrastructure where the payment user accesses the instrument (this can include the cost of branches, agents, POS devices, internet access and the cost of messaging - be it using SMS or USSD and the cost of printing cheques), the cost of hosting the accounts where value is stored and from where it is transferred or received (most commonly a core banking system), and the messaging and settlement infrastructure used to transfer value between participating institutions. Soft costs include regulation and the agreements that need to be established between payment system participants to govern technical standards, pricing agreements, and reconciliation issues.

In low income and/or small countries such as those in East Africa the **cost of infrastructure** needs to be **defrayed over very small transactions and potentially low volumes of transactions**. This creates a number of challenges. Although there is no hard and fast rule as to how much a person is prepared to pay to use a payments instrument a general rule of thumb is the so-called 2% rule¹ - that a person will be unwilling in most instances to spend more than 2% of their income on transactional payment services. This framework can also be used to consider how much individuals are prepared to spend in transaction fees on an individual purchase or transaction. The willingness to pay also depends on the extent to which “substitutes” exist for the service - for instance cross-border remittances routinely cost between 5%-8% of the transaction, whereas research suggests that for merchant purchases neither consumers nor merchants are typically willing to pay more than 4% for the use of an electronic payment instrument. In the domestic money transfer businesses cost of above 3% have often presented a considerable saving over the cost and risk of sending money physically.

Using a 3% **transaction fee as a benchmark**, this fee needs to cover the business needs of all participants in the payments value chain - from issuing institution, aggregators, to clearing and settlement, to the cost incurred by the receiving institution. A detailed study of the distribution of these costs² found that for payment services “front end infrastructure” - branches, ATMs, agents are the most costly service to provide to consumer, comprising about 60% of the transaction fee, the account hosting institutions comprise a further 25% of the fee, leaving approximately 15% of the fee for the aggregator/switching and clearing/settlement services.

¹ FinMark Trust, 2008

² Fighting Poverty Profitably: Bill & Melinda Gates Foundation, 2013

Table 1 provides a useful framework for this study as it uses these metrics to determine some key benchmarks for consideration in this study. The first column considers how much revenue is available to payment service providers across the EAC. In this study we are particularly interested in the potential revenues to all service providers in aggregating/clearing, we estimate this at around USD 40 million across all the markets.

Table 1: Potential Payment Revenues in the EAC (USD)

	EAC GDP monthly per capita income (adult population)	2% of income of transactional services per month	3% of largest transaction (10% of monthly income)*	3% on average transaction (3% of monthly income)*
Estimate	134.6	2.7	0.4	0.1
60% for front end infrastructure		1.6	0.2	0.07
25% for hosting institution		0.7	0.1	0.03
15% for aggregation / clearing		0.4	0.06	0.02
Adult population in EAC millions		89.3		
Total potential revenue (in million USD)		35.7		

Estimate data. Source: World Economic outlook and World bank database

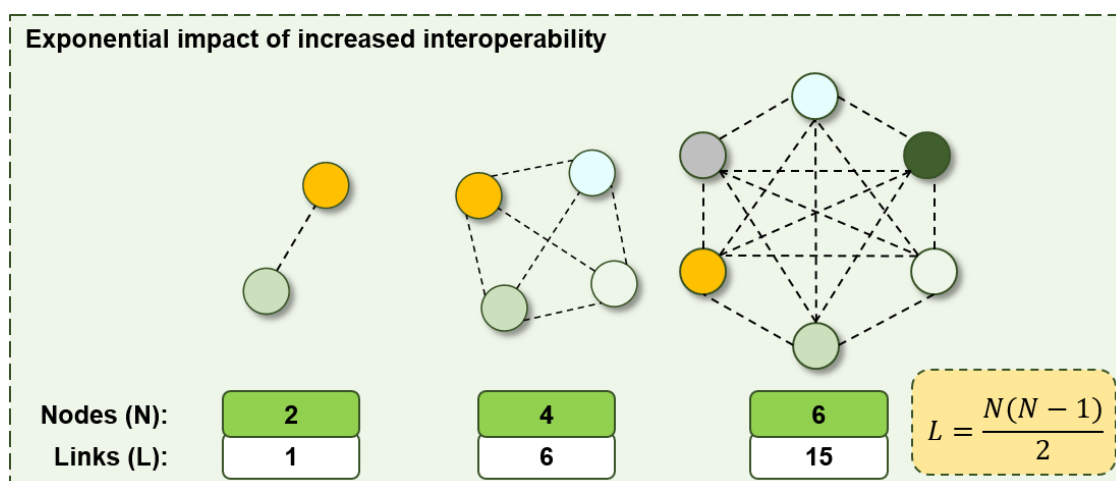
The second and third columns establish a benchmark of how much aggregating and clearing transactions should be charged given the levels of income in the region. A key focus of this study is to compare this benchmark “asking” price - the price that a consumer will be willing to pay to adopt a payment product with the price “offered” by infrastructure service providers in the markets within the region and the extent to which such offered prices reflect a lack of scale in the market.

If as noted above there are a number of fixed costs to the provision of market infrastructure it is also important to note the scale economics of such services. Visa/Mastercard process billions of transactions a year through three global switching hubs at an “offer” price of around USD 0.025 (2.5 cents) per transaction. In South Africa the national switch Bankserv processes transactions for a fee of between USD 0.015 and USD 0.02 per transaction. Both prices that would fall within the affordability range noted above.

Clearly what institutions “offer” is determined by the volume of business, their operating and establishment costs and ownership structure. The recently established Kenya KITS platform provides an indication of the current cost of establishing an inter-bank switch. To get to the point of going live the Kenya Bankers Association have invested USD 7 million.

Given the difficulties in achieving scale it is worthwhile considering whether alternatives exist to the establishment of inter-participant schemes. As is well known (and shown below in Figure 1), the number of connections in a network increase exponentially as the number of market participants increase. Thus for a market with two or three participants - such as the MNO market in most countries in East Africa market participants should they wish to, can build bilateral connections to enable inter-operable payments between their platforms. However as the number of market participants increase establishing a common platform with rules that do not need to be negotiated bilaterally between members becomes the norm for a payment system.

Figure 1: Metcalfe's Law³



Similarly, as the volume of payments and market participants increase the risk of settlement default between market participants rises which is why all domestic payment markets rely on the use of a single settlement counterparty in the form of a central bank.

The next section of the report starts to provide some consideration of the current size of the payments markets in East Africa before a consideration of the current structure of the payments industry and how interoperability is currently achieving within each payment stream in each country in East Africa.

3.1. REGIONAL ECONOMICS AND BANKING DEMOGRAPHICS

The EAC is comprised of 6 countries (Kenya, Tanzania, Uganda, Rwanda, Burundi and South Sudan) with a combined nominal GDP of USD 146 billion and a population of 150 million. The table below gives an economic and demographic overview of 5 key EAC countries as of 2015⁴.

Table 2: Country demographics

	GDP (In Billion USD)	Population (million)	GDP per Capita
Kenya	\$64	46.0	\$1377
Tanzania	\$24	53.5	\$853
Uganda	\$46	39.0	\$623
Rwanda	\$8	11.6	\$699
Burundi	\$2	11.2	\$256

Source: World Bank database and World Economic Outlook

Trade between the countries has been growing rapidly with EAC total intra-trade having increased from USD2.2 billion in 2010 to USD 3.3 billion in 2015. Nonetheless, intra-regional trade accounts for a limited share of total trade in each of the countries, only accounting for 7.7% in Kenya, 7.0% in Tanzania, 19.2% in Uganda, 18.4% in Burundi and 24.12% in Rwanda. Similarly, despite the increase in investment flows within the region, the volume is quite low when compared to total investment flows.

³ Metcalfe's Law, the value of a telecommunications network is proportional to the square of the number of connected users of the system.

⁴ World bank database, 2017

Table 3: Intra-EAC investment

(Flows as % of total investment, 2014)

Total regional trade

Countries		Sending country				
		Kenya	Tanzania	Uganda	Rwanda	Burundi
Receiving country	Kenya		-	0.10%	-	-
	Tanzania	1.52%		0.19%	-	0.18%
	Uganda	3.19%	0.36%		-	-
	Rwanda	1.04%	0.33%	3.66%		-
	Burundi	-	-	-	0.93%	

Source: East African Trade Report 2015

A further analysis of trading patterns between member states shows that the landlocked countries (Uganda, Burundi and Rwanda) largely exported coffee and tea to Kenya and Tanzania. This suggests that the level of intra-regional trade may be overstated seeing that EAC's largest export to the rest of the world is also coffee and tea - suggesting that some regional exports are actually through trade. The region's main imports are mineral fuels and their products, which again show up in Kenyan and Tanzania data as exports although most of these products are imported from the rest of the world.

Table 4: Value of Trade Flows

(Total regional trade, millions, USD, 2015)

Countries		Receiving Country					Totals Exports
		Kenya	Tanzania	Uganda	Rwanda	Burundi	
Sending Country	Kenya		342.9	698.5	182.8	67.2	1291.4
	Tanzania	852.70		56.4	41.9	41.3	992.3
	Uganda	523.4	79		259.3	48.1	909.8
	Rwanda	90.7	1.9	10.0		17.6	120.2
	Burundi	2.3	2.0	4.0	5.5		13.8
Total imports		1469.1	425.8	768.9	489.5	174.2	3327.5

Source: East African Trade Report 2016

The trade in services between countries is also significant and growing. Total trade in services between countries in the region are estimated at USD 2.6 billion.

Table 5: Value of Services flows
(Million, USD, 2014 Kenya and 2015)
Regional trade

Sending Country	Receiving Country					Total exports
	Kenya	Tanzania	Uganda	Rwanda	Burundi	
Kenya* (2014)		274.1	558.4	146.1	53.7	1032.3
Tanzania	559.9		37.0	27.5	27.1	651.5
Uganda	426.8	64.4		211.5	39.2	741.9
Rwanda	95.6	2.0	10.5		18.5	126.6
Burundi	1.1	0.9	1.9	2.6		6.5
Total imports	1083.4	341.4	607.8	387.7	138.5	2558.8

Source: Total services exports, IMF BOP Payments statistics

*Regional service flows are estimated to have the same proportional relationship as they do to trade flows in the absence of other disaggregated data

Combined this data suggests that total financial flows between the countries in the region amount to around USD 6.1 billion in 2015. A key focus of this report is to understand the ways in which these flows are intermediated through the payment system and how improvements in the infrastructure can reduce the costs to participants and ensure more of these flows are intermediated rather than occurring in cash. A particular concern and focus of this project is to understand how businesses and individuals transact across border and how improving cross-border payments can further the economic and policy objectives of regional integration.

The next section describes the structure of payments industry and the options available to market participants for making domestic and cross border payments.

3.2. VOLUME AND VALUE OF PAYMENT PRODUCT USAGE

Despite the rapid growth in these markets the level of usage of products from the formal banking sector remains relatively limited, however, across all markets mobile money services provided by the MNOs have proved very popular (Table 6).

Table 6: Banking penetration and use of bank products
(Millions, 2010 - Burundi, 2016)

Millions	Population	Banked population	Mobile money subscribers	Smartphone users
Kenya	46.0	10.3	37.8	8.8
Tanzania	53.5	7.1	39.6	3.2
Uganda	39.0	4.1	22.6	1.8
Rwanda	11.6	2.8	9.7	0.7
Burundi*	11.2	0.9	3.2	0.04

*estimated by using previous trends to forecast 2010 data from Burundi Financial Inclusion report, UNCTAD mobile money report and GSMA Intelligence database to get latest values

Source: Respective countries Finscope reports | Central Bank Payments Statistics | The Rwandan banker report, BNR

Tables 7 to 10, below consider the actual level of usage of different payment products within each country.

Table 7: Volume of transactions per year
(Millions, 2011*, 2015)

Countries	Cheques	Card	Mobile Money	EFT
Kenya	19.4	216.2	1,526	11.8
Tanzania	1.6	20.1	1,388	4.1
Uganda	1.3	71.8*	693.0	7.6
Rwanda	0.3	9.8	205.7	2.3
Burundi	0.13	0.1	0.295	0.13

Notes, *estimated using 2011 values from BOU statistical abstract and projected growth with the growth of ATMs |
**estimated using the ratio of mobile money payments to Rwanda - assumed that 60% of Burundi ACH values were EFT while 40% were cheques

Source: Central Bank websites and reports, BOU statistical abstract, Burundi Financial inclusion report

Table 8: Volume of transactions per user per year
(Millions, 2011*, 2015, 2016)

Countries	Cheques	Card	Mobile Money	EFT
Kenya	1.9	21.0	44.2	1.1
Tanzania	0.2	2.8	52.9	0.4
Uganda	0.3	17.5	32.8	1.9
Rwanda	0.1	3.5	21.2	0.9
Burundi	0.1	1	3	0.1

-Transactions per user for cheques, card and EFT used volume/banked population

-Transactions per user for mobile money used volume/mobile money subscribers

-For Rwanda, EFT and Cheque values given are for 2015 but banked population is latest

Table 9: Value of transactions per year
(Millions USD, 2011*, 2015, 2016)

Countries	Cheques	Card	Mobile Money	EFT
Kenya	26,195	13,883	33,359	5,607
Tanzania	2,983	1,008	22,305	1,328
Uganda	1,825	4,307*	9,702	4,702
Rwanda	710.8	558.8	1,224	1,089
Burundi	82.6	30	18	123.9

*Estimated Uganda card transactions using 2011 values and projected growth of value of transactions with the growth of ATMs

Source: Central Bank websites and reports, BOU statistical abstract

Table 10: Average value per transaction

	Cheques	Card	Mobile Money	EFT
Kenya	1,350	62.2	21.9	474.7
Tanzania	1,864	50.0*	16.1	321.5
Uganda	1,404	60.0*	14.0	618.7
Rwanda	2,442	57.0	6.0	479.0
Burundi	674.6	30	6.0	674.6

**Estimated the average value per card transaction for EA as USD 60 given data from other countries. Lowered the value for Tanzania to USD 50 and Burundi to USD 30 after reconciliation with the total value of transactions and adjustments to GDP per capita.*

Source: Central Bank Websites and Reports

Although the region's usage of card and cheques is quite low, there has been gradual growth as a result of improved electronic banking systems as well as the deployment of more ATMs and POS devices. The average value per transaction for cards suggests that they may be mainly used for retail purchases and withdrawals whereas the average value of cheques suggests that they are mainly used for B2B or B2G payments. Evidently, mobile money is the dominant payment channel across East Africa in terms of total value and volume of transactions. The average value per transaction however remains quite small. For EFT payments, the size and frequency of transactions suggests that most EFT transactions are salary and business payments and very few are retail P2P transactions.

3.3. CROSS-BORDER PAYMENTS

Our estimates suggest that the value of cross border financial flows and thus payments is in the region of USD 6.3 billion per year. Unfortunately, there is very limited information on how these payments are made. We have however been able to gather some information on the usage of mobile money in cross border payments and have provided estimates per channel below (Table 11):

Table 11: Value of inter-EAC Cross border payments per instrument

	Cash	Mobile Money	MTO	EFT	Total
Kenya	507.1	1.0	253.5	1773.7	2,535
Tanzania	339.7	1.2	169.8	1187.6	1,698
Uganda	348.1	0.9	174.1	1217.5	1,741
Rwanda	61.2	0.3	30.6	214.0	306.2
Burundi	7.1	0.2	3.5	24.5	35.4
Total	1,263	3.6	631.6	4,417	6,316

Total payments calculated as sum of total imports, total exports, total services, traded investment flows, and personal transfers

Personal Transfers - total personal remittances paid proportion by migration flows

Mobile money – spread of 5000 transactions a month according to population share and assume average transaction value is \$60

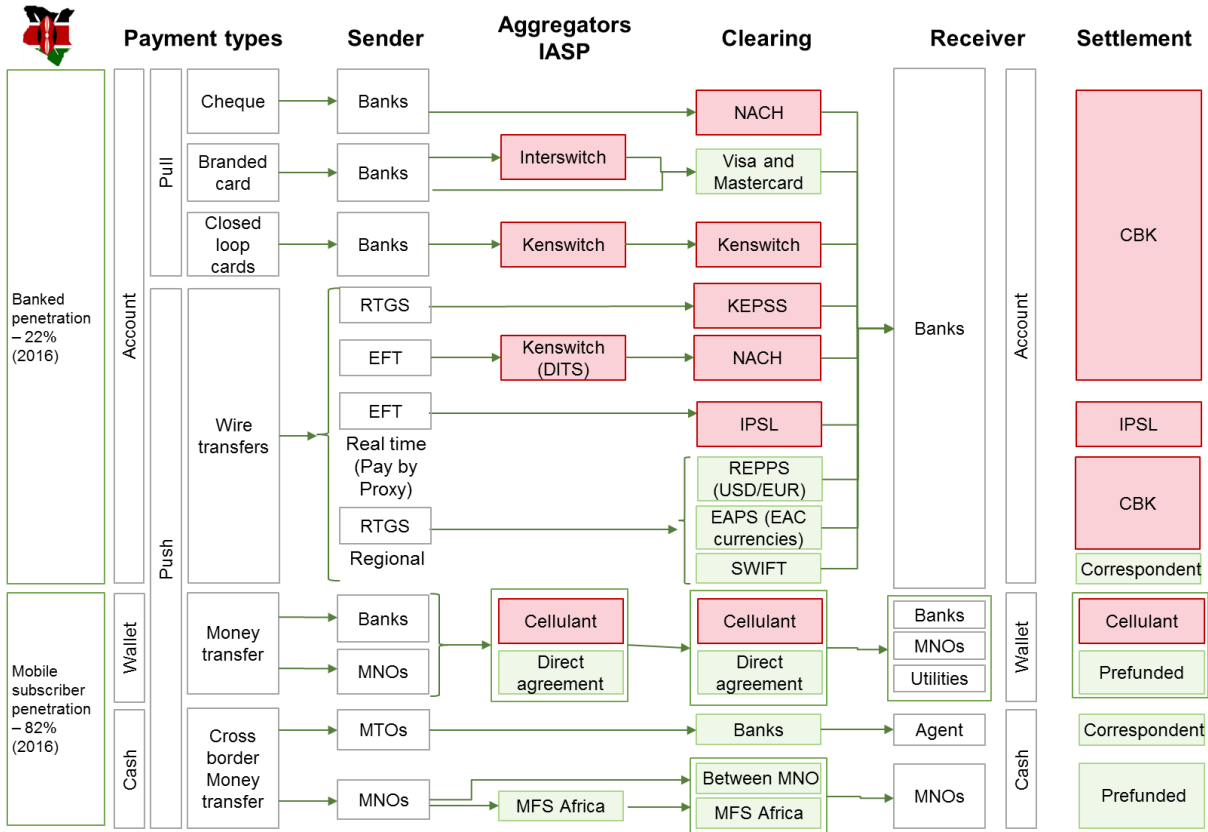
Cash - 20% of total payments value & MTO - 10% of total payments & EFT- Balance

Although mobile money is a dominant domestic payment channel in the region, its use is limited in cross border payments. On the other hand, EFT is the most widely used channel as most cross border payments are trade related and therefore made in bulk. There is still potential for growing mobile payments intra-regionally by substituting low value cash payments in trade transactions, especially in the informal sector.

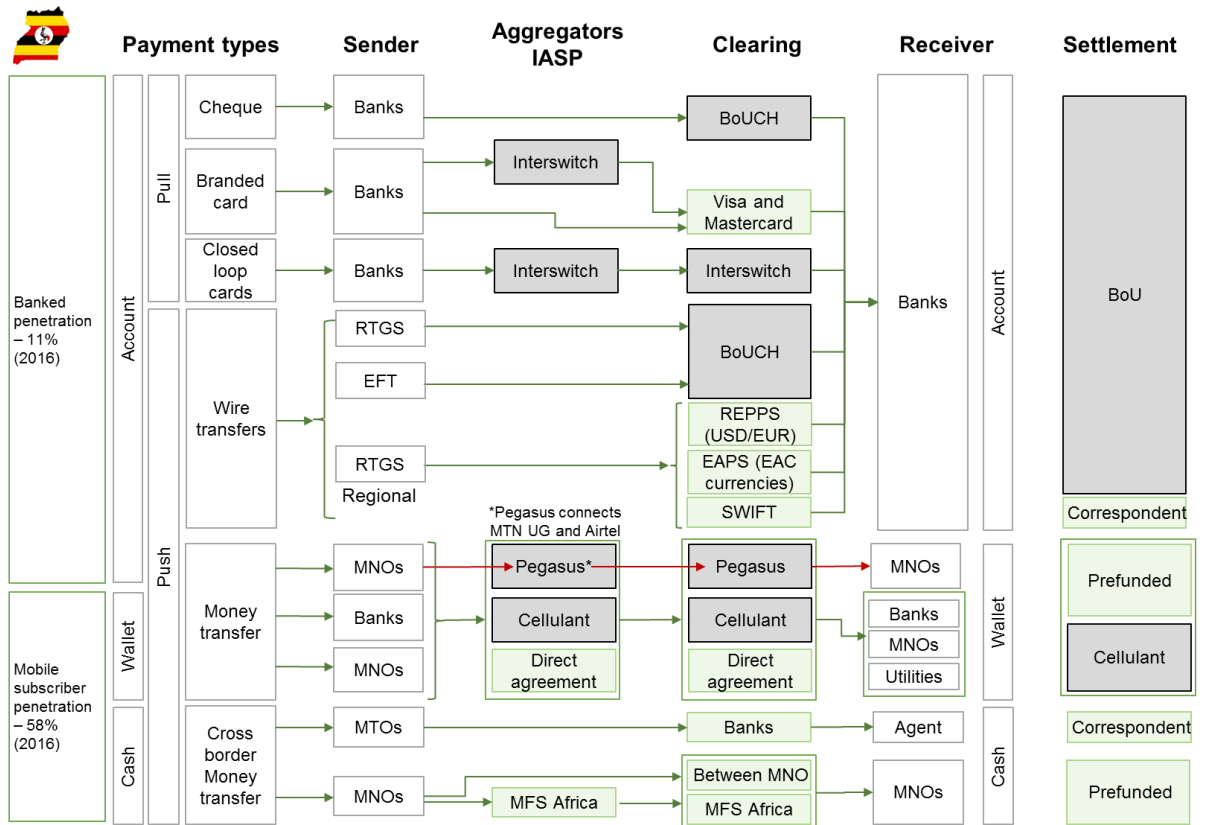
4. INDUSTRY STRUCTURE

The figures below provides a summary of the infrastructure that facilitates payments within and between the countries of East Africa. The first three columns consider the nature of the payments instrument and activity, and the source of funds - be it from an account, wallet or cash. The next column considers the sending institution from which the payment will originate from. The next three columns provide information on the aggregators or payment instructions be it on the sending or receiving side, as well as how clearing and where the settlement occurs for each payment. The final two columns consider the receiver of the payment and its store of value. More detail on each payment type and the participating infrastructure provider follows the table.

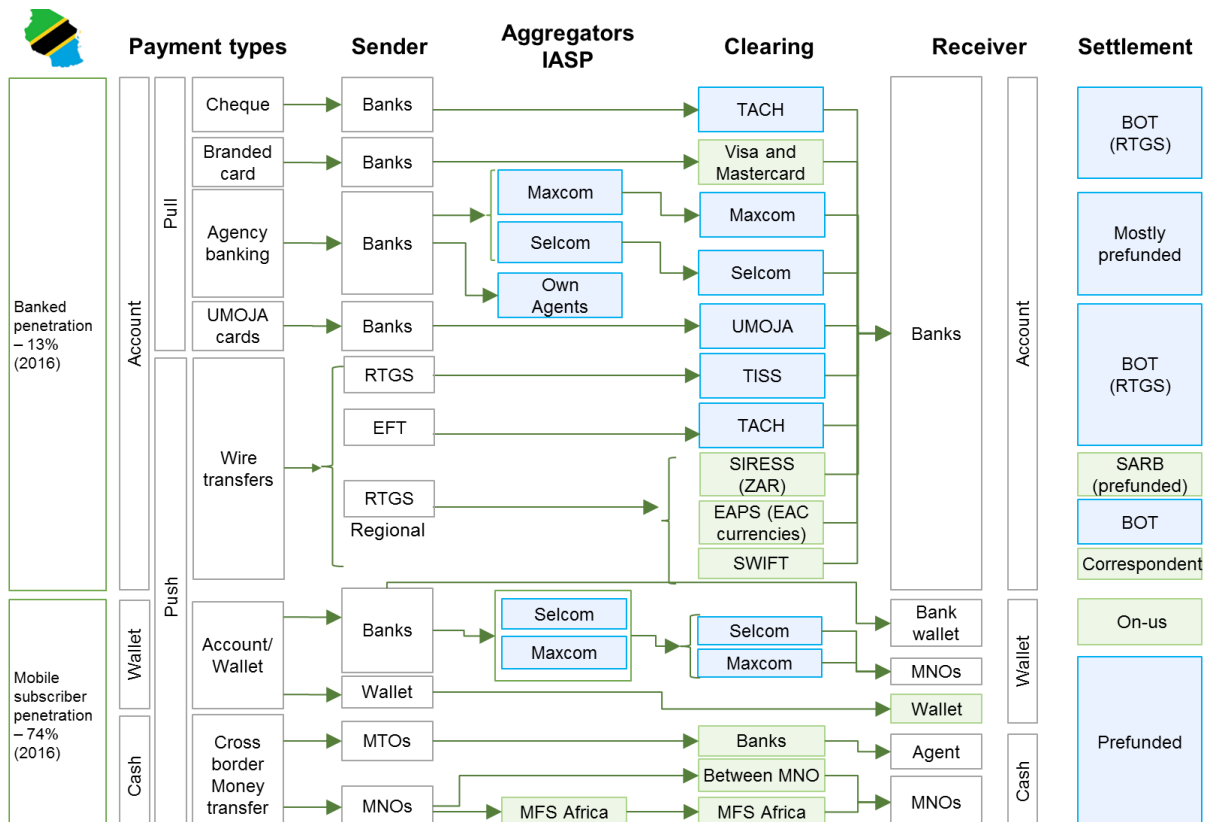
4.1. KENYAN PAYMENTS LANDSCAPE



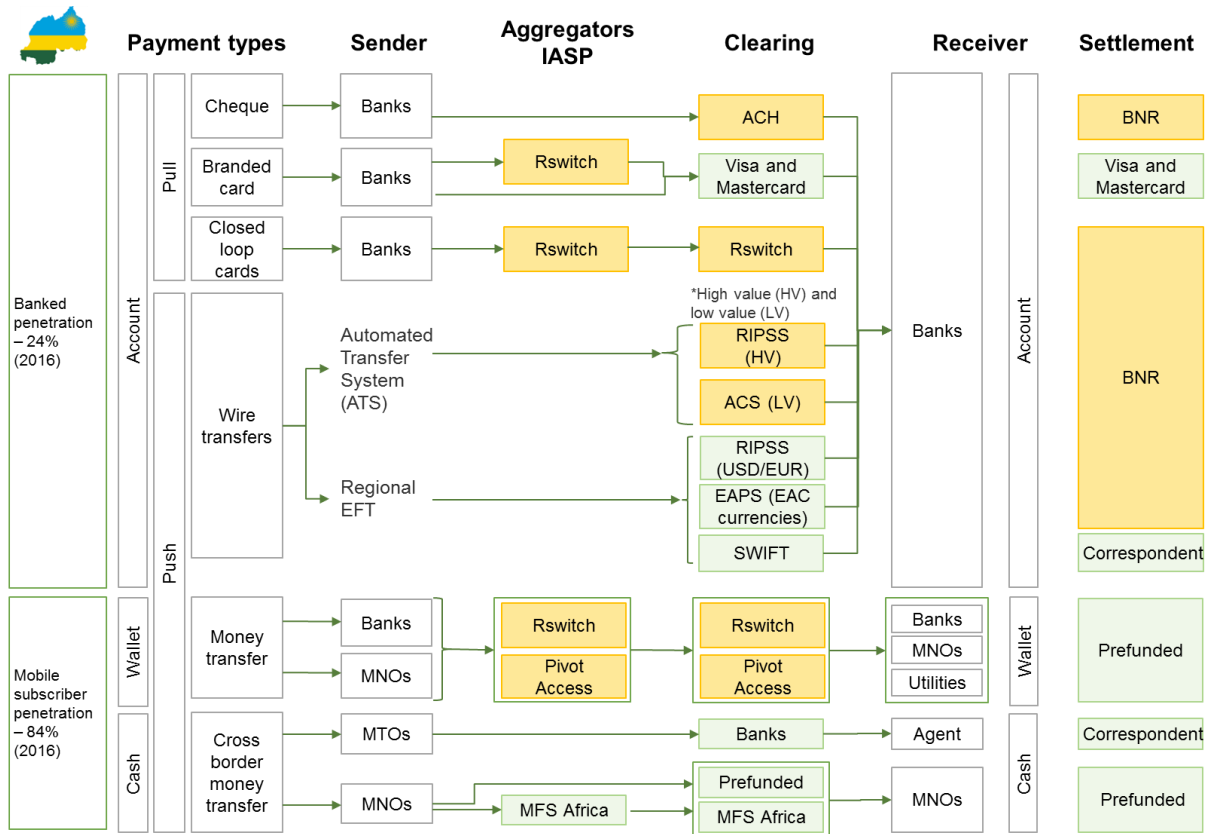
4.2. UGANDAN PAYMENTS LANDSCAPE



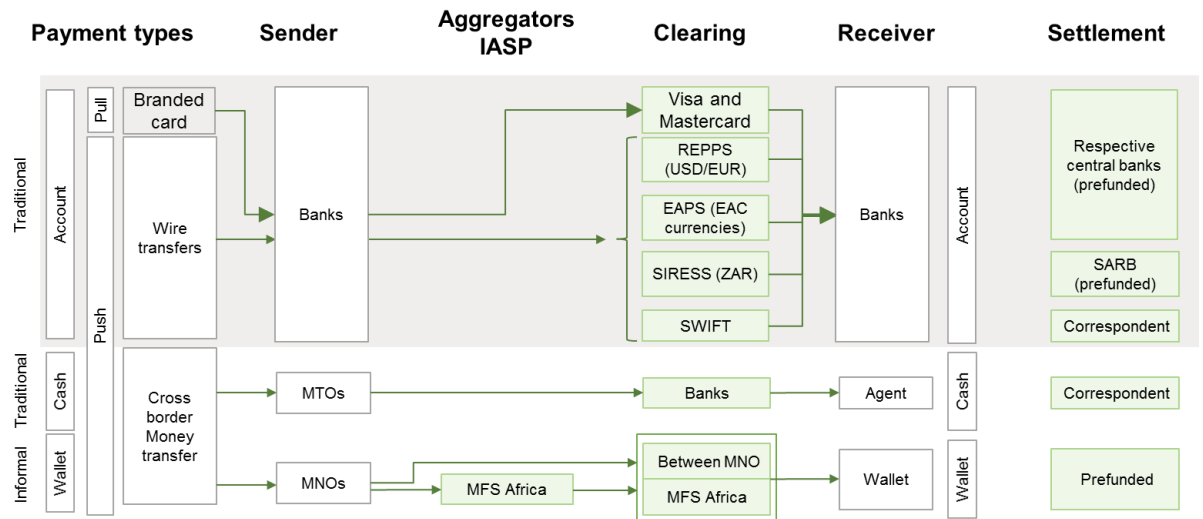
4.3. TANZANIAN PAYMENTS LANDSCAPE



4.4. RWANDAN PAYMENTS LANDSCAPE



4.5. CROSS-BORDER PAYMENTS MAPPING COMPARISON



5. PAYMENTS INFRASTRUCTURE BY INSTRUMENT

5.1. CHEQUE PROCESSING

Although cheque usage is declining in many markets, in East Africa the value of cheque usage has remained relatively constant. This probably reflects both the structure of the market, namely the preponderance of small business and Government employment which have proved to be the heaviest users of cheques in most markets. There have been attempts to improve the efficiency of cheque clearing through the move to truncation in Kenya, Tanzania, Rwanda (scheduled - no confirm dates) and in Uganda (scheduled for the end of 2017).

Currently each market operates a cheque clearing house:

- In Kenya, the NACH (Nairobi Automated Clearing House), which is owned and operated by the Central bank, clears cheques and low value ETFs. The value of cheques is capped at KES 1 million (USD 9,526) with the average price of a cheque book at KES 500 (USD 4.8). After the introduction of cheque truncation in 2011, the clearing cycle reduced from T+3 to T+1. CBK charges around KES. 30 (USD 0.3) to banks for clearing with no interchange fees between banks. Settlement is done using settlement accounts held at CBK by all domestic banks. Cross border cheques go through the Domestic Foreign Currency Cheque Clearing system in the NACH and sent for collection by domestic banks. Cheques are rarely used for cross border payments because of the lengthy clearing process (could take up to a month).
- The Uganda clearing house is owned and operated by the Bank of Uganda with 23 financial institutions as participants. Currently, the system is referred to as ECS (Electronic Clearing System) because cheque truncation will only be implemented by February 2018. Cheques are capped at UGX 20 million (USD 5,460) and the average price fee per cheque is UGX 30,000 (USD 8.2). The clearing process takes an average of three days. BoU charges UGX 1000 (USD 0.27) to banks for the the clearing and processing of cheques.
- Tanzania Automated Clearing House (TACH) is owned and operated by the Bank of Tanzania. Cheques and EFTs that are below TZS 20 Million (USD 8,813) are cleared through the TACH and settled through the RTGS system. The average price of a cheque book is Tsh 25,000 (USD 11).The TACH has had cheque truncation since May 2011 and currently has three clearing sessions. If a payment is made during the day it should processed by end of the day, otherwise any payments made after 4:30 takes T+1 to process. Only local cheques can be cleared either in USD and TZS.
- The Automated Clearing House (ACH) in Rwanda is owned and operated by the National Bank of Rwanda and is part of the Automated Transfer System (ATS) that was implemented in 2011. The ACH provides clearing and netting facilities for a range of low value electronic instruments including direct debits, direct credits and cheques. Rwanda is still in the process of implementing truncation, there are no confirmed dates of when this will be finalised.
- Burundi recently only went live with its RTGS system. The volumes of cheques are relatively low compared to other EAC market. According to the Bank of Burundi Annual

report, cheque volumes showed a slight increase in 2014 (117,600 vs. 136,224). According to the same report, approximately 99.5% of payments are still concluded in cash.

There are no arrangements for receiving or processing cheques across borders within the EAC.

Although cheque clearing has traditionally been seen as something that needs to be done nationally, given the need for proximity in the physical movement of cheques, with the move to truncation, a single facility for the region would considerably reduce costs.

We estimate that the cost to run an ACH is approximately USD2 or 5 million per year in the EAC. Thus maintaining 5 different ACHs costs community payment system participants a total of USD 40-50 million per year. Consolidation into a single regional facility could thus reduce costs by around 40%.

5.2. CARD PAYMENTS

Card payments have not grown as rapidly in the region as could be expected given the growth in the different economies and rising levels of income. This has been the result of a fragmented card market, insufficient infrastructure to support card transactions, and the rapid growth in mobile money and its increased use in retail payments. There has however been an significant expansion in the acquiring infrastructure as shown below (Table 12):

Table 12: Number of ATMs and POS Machines
(2010, 2015)

Countries	ATM			POS Machines		
	2010	2015	% change	2010	2015	% change
Kenya	2,091	2,718	30.0%	18,179	22,230	22.3%
Tanzania	1,060	1,771	67.1%	1,978	5,143	160.0%
Uganda	625	859	37.4%	734	1,742	137.3%
Rwanda	84	380	352.4%	99	1,718	1635.4%
Burundi	27	160	-	-	-	-

Sources: Kenya, Tanzania and Rwanda Central Bank websites, Uganda and burundi Financial Inclusion Reports, CGAP Financial Access data.

There is limited interoperability in the ATM infrastructure and non-association cards do not work on the POS infrastructure, with the exception of Smartcash cards in Rwanda that are interoperable⁵.

As shown in the table above the issuing and acquiring agreements are fragmented. In each market the larger banks issue Visa / Mastercard products, and the smaller banks issue cards supported by the domestic aggregators - Kenswitch (Kenya), Umoja (Tanzania), Interswitch (Uganda) and Rswitch (Rwanda). This fragmentation limits the volume of cards transactions processed by any of the aggregators.

There is however some level of interoperability:

⁵ <http://www.newtimes.co.rw/section/article/2013-04-16/64928/>

- Kenswitch cards and card association cards can be used on Interswitch operated ATMs in Kenya, however card association cards cannot be used on Kenswitch ATMs.
- Interswitch cards are issued and accepted on Interswitch ATMs in Uganda, but not on non-Interswitch banks (which are the major banks - Stanbic, Barclays, Standard Chartered).
- Rswitch cards are issued and accepted on all ATMs in Rwanda, and through partnership agreements can be used on Kenswitch ATMs in Kenya.

Although connectivity has been established between Kenswitch, Interswitch (Uganda and Kenya), Umoja and Rswitch, customers are not yet able to benefit from this connectivity as regional commercial and settlement arrangements need to be established between the different payment systems participants.

In Burundi, there are about 330 Visa and Mastercard branded cards. Most of the remaining 21,000 cards serve as ATM cards.

5.3. ELECTRONIC FUND TRANSFERS (EFT)

As shown in table 7, the level of EFT usage has been limited with many banks offering “internet banking” but in which actual EFT’s involve a manual capture from the banking system and then entering into the respective clearing and settlement platform. We estimate that EFT is mainly used for salary payments across the region, especially for government workers. The situation in each country is described below:

Kenya

In Kenya, EFT comes at a high cost to customers with each online transaction averaging at KES 150 (USD 1.4) and in-branch transaction at KES 250 (USD 2.4). The NACH can clear EFTs valued below KES 1 million (USD 9,526) but any other payments beyond this amount are processed and settled through RTGS (KEPSS). Although KEPSS can still process transactions below KES1 million (USD 9,526), banks prefer to use EFT as they are marginally cheaper than RTGS transactions which averagely cost KES 400 (USD 3.8). EFT transactions are settled on a net basis by settlement accounts held by local banks at the CBK. Low value transactions (USD 0.1 to USD 9, 526) are available through PesaLink. Currently, 25 banks are connected to PesaLink. The PesaLink system currently processes around 2,000 transaction a day amounting to a value of KES10 million (USD 95,255). Given that the service is quite new in the market, these numbers are expected to significantly rise. IPSL is responsible for clearing and switching PesaLink transactions with settlement through NACH. Aggregators such as Interswitch, Kenswitch, Cellulant and Craft Silicon connect their participating banks to the PesaLink system. IPSL charges KES 11.2 (USD 0.10) to switch a transaction (includes the interchange fee of KES 5.60).

Uganda

In Uganda, all EFTs are cleared through the ECS and settled through the RTGS system known as the Uganda National Interbank Settlement (UNIS) system on net basis. Account to account transactions via RTGS are only available for Tier I institutions, using SWIFT for clearing. Although UNIS is mainly used for high value payments, low value transactions can also be processed through the system. Banks are however hesitant to use this channel because of the

high costs associated with training the staff to use the system. The BoU charges the commercial banks a monthly fee to banks to use the system as well as a fee of UGS 1500 (USD 0.4) per transaction. For bank customers, EFTs and RTGS payments on average are priced at UGS 5,000 (USD 1.4) and UGS 15,000 (USD 4.1) respectively. UNIS is connected into EAPS and REPSS.

Tanzania

In Tanzania, EFTs are cleared through the TACH and settled through the RTGS system known as the Tanzania Interbank Settlement System (TISS) on net basis. The TISS system is used for high value payments and time critical low value payments. The BoT charges the banks TZS 1,200 (USD 0.5) to process RTGS transfers while banks can charge their customers up to TZS 10,000 (USD 4.4) for the service. From customer experience, the RTGS is real time, but manual process in the banks means that it can take a maximum of 2 hours to reflect in customer accounts. EFT transfers are cheaper than RTGS, with the average cost at TZS 2,500 (USD 1.1). EFTs can be settled within a day or a maximum of 48 hours.

Rwanda

A component of the Rwanda Integrated Payments Processing System (RIPPS) is the Automated Transfer System (ATS), which is composed of an Automated Clearing House (ACH) and Real Time Gross Settlement System (RTGS) for large value and time critical (wire) payments. As of 2015, RIPPS has 16 participating banks. All EFT go through the BNR (High-value payments - RTGS system) and Retail payment (wire transfers, cheques) go through the ACH managed also by BNR. RIPPS was not prepared to share pricing or transaction volume data with the project team.

Burundi

Burundi, recently went live with its RTGS system and banks are still in the process of connecting to the system. According to the Bank of Burundi in 2014, the total interbank transfers amounted to 137,050.

5.4. CROSS BORDER EFT

The traditional cross border payments system within the region relied on local banks establishing correspondent banking relationships with banks in other countries in the region and to hold nostro accounts with correspondent banks that initiate the cross border payments made in USD. The correspondent banks then settle their transaction on a net basis and using SWIFT to clear all transactions. This process is quite expensive as the local banks have to pay correspondent fees. Additionally, the settlement time is slow. As a result the central banks in the region have been collaborating on the establishment of regional payments systems - namely the East African Payment System (EAPS) and the Regional Payment and Settlement System (REPSS).

EAPS enables money transfer by connecting the national RTGS in Kenya, Rwanda, Tanzania and Uganda and enables settlement in the local EAC currencies. Burundi is not yet fully integrated into EAPS as the local RTGS system has only recently gone live. Transactions are cleared through the respective EAC central banks with the use of SWIFT messaging. Local banks are required to maintain pre-funded accounts in all EAC currencies in the CBK to facilitate settlement that happens within a day.

The REPPS system was established to enable cross border high value payments between countries in the COMESA region. The system is available in 8 countries including Kenya, Rwanda and Uganda (but not Tanzania). Transactions are made in USD or Euro although there are plans to also include local currencies. The system also uses SWIFT messaging for clearing between the respective central banks via the COMESA clearing house. The settlement process is handled by Bank of Mauritius and requires local banks to have pre-funded USD and Euro accounts in the Bank of Mauritius. Each COMESA central bank that sends messages to the CCH uses MT 202 or MT 103 messages to the BIC address of the CCH.

Based on stakeholder interviews carried out, local commercial banks and respective central banks preferred using EAPS because of its cost effectiveness and convenience. The main challenge for EAPS is the availability of currency conversion especially through corridors with low trade volumes (e.g between Uganda and Tanzania). On the other hand, local banks mentioned that they preferred the easier SWIFT messaging provided by REPSS.

5.5. MOBILE MONEY

The main mobile money products in the region were established as closed loop products by MNOs and thus all clearing and settlement was managed internally to the provider. More recently some level of interoperability has been established within country and between countries.

In Kenya, this is not mandated and there is currently no interoperability between MNO platforms despite various engagements that have been recently facilitated by regulators.

In Tanzania, the MNO's have established interoperability. For instance, Vodacom, Airtel and Tigo can send and received money from each other, while Zantel can only send and receive money from Tigo⁶. Currently, interoperability is only for P2P transactions although there are plans to expand to P2B transactions in the near future. Clearing is handled bilaterally between partners and settlement is completed through prefunded accounts.

In Uganda, interoperability has been mandated and the BoU instructed MNOs to complete the connection by April 2017. MTN and Airtel (the main operators) have proceeded to connect through API via Pegasus Technologies (a payment gateway provider). MNOs are expected to gradually move towards direct connections without a PSP or gateway.

In Rwanda, the Mobile network operators include MTN Rwanda, Tigo Rwanda and Airtel. Mobile money interoperability has been mandated and is being facilitated by Rswitch. However, practically interoperability has not been achieved yet. Currently, only Tigo and Airtel can send and receive money directly into each other wallets. MTN has been in discussion of connecting to Rswitch for about two years. It is understood that the main delay for the MTN connection is the ownership structure of Rswitch and Tigo, who are both are majority owned by Millicom.

In Burundi, electronic payment services are offered through the products from EcoCash, McAsh and Leo Manoti which are mobile based but there is no inter-operability.

A widely used mobile money product in East Africa is the transfer of funds from a mobile

⁶ IFC report-Tanzania mobile financial services interoperability http://africaleadff.org/wp-content/uploads/2016/04/EAC-Cross-Border-Payments-April-11-2016_Final.pdf

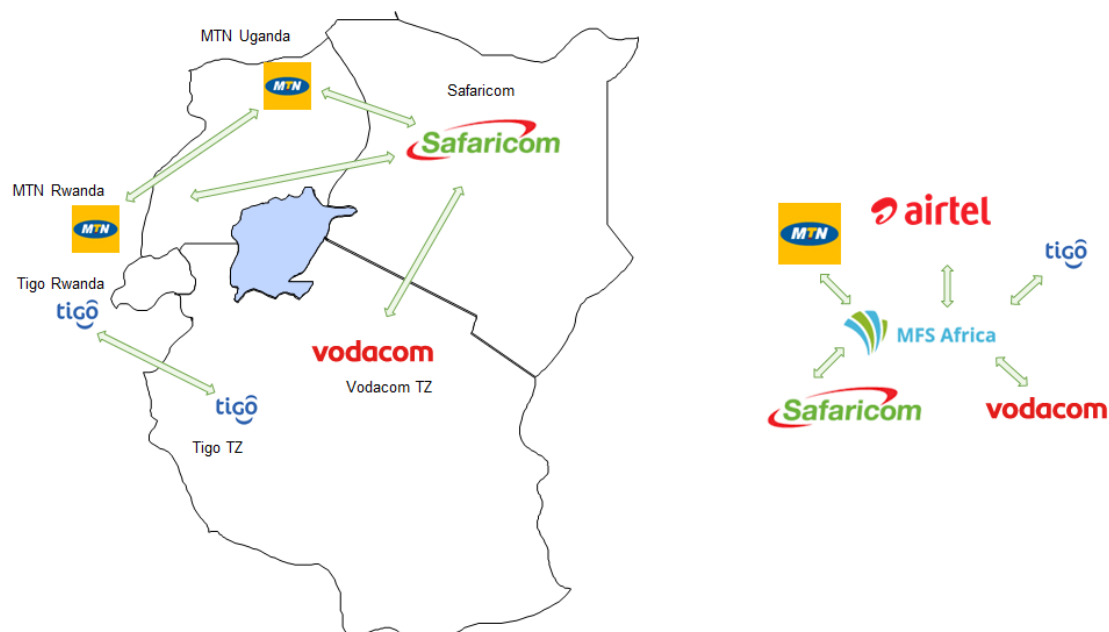
money wallet to a bank account and vice versa. This is enabled by linking MNOs and banks through direct bilateral agreements or by using an aggregator. The service is mostly integrated into mobile banking especially when using an aggregator while the few banks that directly link to MNOs usually have accounts enabled for push and pull transactions.

In Kenya, the main aggregators for mobile-bank transactions are Craft Silicon and Cellulant. In Uganda the main providers are Pegasus, Cellulant, Yo! Payments and True African. In Tanzania Maxcom and Selcom dominate the market. In Rwanda, Pivot Acces is the main aggregator. The business model of these providers is generally similar - the core of their business is connect banks to MNOs, and enable push payments between bank accounts and MNO mobile money products. In most cases clearing is usually done by the aggregators, while settlement is handled through prefunded accounts.

Cross border payments have been launched between some MNO's, these are mostly bilateral agreements.

- Safaricom sends and receives from MTN Uganda, MTN Rwanda and Vodacom Tanzania
- Airtel has announced cross-border payments between the countries in which it operates (Kenya, Uganda, Tanzania and Rwanda) but has not yet gone live.
- Tigo Tanzania can send and receive money from Tigo Rwanda, and vice versa.
- Vodacom TZ can send and receive money from Safaricom Kenya.
- MTN Uganda can send and receive money from MTN Tanzania and Safaricom Kenya.
- MTN Rwanda can send and receive money from MTN Uganda and Safaricom Kenya.
- Zantel Tanzania cannot send or receive money from other East African mobile networks
- Ecocash and Lumitel Burundi cannot send or receive money from other East African mobile networks.

Figure 2: Bilateral mobile money wallet to wallet transfer corridors versus MFS Africa partnerships



Cross border mobile money payments are currently being facilitated by MFS Africa. MFS has integrations with all the MNOs in the region and when a customer initiates a payment to a mobile number from another country the MNO routes this instruction to MFS that instructs the receiving MNO to credit the respective mobile number. The average value of a cross border payment is \$60 and approximately 5000 transactions occur each month. MFS then prepares daily clearing and settlement instructions. MNOs are responsible for ensuring that all transactions meet KYC requirements.

Based on an exercise conducted by CGAP, the average total fees related with cross border mobile transfer amounts to 3.3% of the transaction value when sending USD 60. We apply the USD 60, because prior research found this to be closer to the average value of cross-border money transfer. Most of the transactions were quite cumbersome to make as they required the customer to remember USSD strings. This may be a constraint for cross border usage of mobile money especially when making frequent transactions. Tigo Tanzania has attempted to eliminate USSD issues with the Tigo pesa app but the adoption has been slow given the low smartphone penetration. The fees and exchange rates are well disclosed to the consumer with the exception of transactions between M-Pesa Kenya and Tanzania. The table gives a summary of the different fees related with sending USD 60 across the EA region.

Table 13: Fees related with sending USD 60 across EA Region in USD

Flow of Mobile money cross border transfer	Transfer Fees	Forex Drift (Amount sent-amount received)	Total Fees	Total fees as % of transactional value
M-Pesa Kenya to M-Pesa Tanzania	0.80	0.80	3.14	2.67%
M-Pesa Tanzania to M-Pesa Kenya	0.4	1.2	2.32	2.67%
TIGO Rwanda to TIGO Tanzania	0.0	2.05	2.05	3.42%
TIGO Tanzania to TIGO Rwanda	0.0	0.88	0.88	1.47%
MTN Rwanda to MTN Uganda	2.20	1.54	4.71	6.23%
M-Pesa Kenya to MTN Rwanda	0.8	1.07	2.75	3.12%
M-Pesa Kenya to MTN Uganda	0.8	1.30	3.07	3.50%

Source:CGAP Exercise, MNO Websites

**Retrieved transfer fee from sending MNOs' website. Estimated the increase in forex drift using % increase in transfer fee. Confirmed it is free to send money between Tigo Tanzania and Tigo Rwanda, estimated the increase in forex drift using % increase in local transfer fees*

5.6. MTO AND HAWALA

The leading global money transfer organisations all operate across the region and make payments between the countries in the region - mainly receiving and paying out cash. Unfortunately the volume / value of transactions handled by such companies is not available.

Most MTO's operate a similar model - they manage a single global IT infrastructure to capture and close transactions and maintain bank accounts in each country and transfer net amounts using the banking system. The main international MTOs in the region are Western Union, MoneyGram, UAE Exchange and Xpress Money. These MTO's have agents many of which are banks in each country and generally agent exclusivity is not allowed. Our research did not identify any regional money transfer companies of any scale. In Kenya, most of the local MTOs were mainly facilitating remittances to Somalia and had branches across one or two East African countries. Some of the operators identified include:

- Amal express - send and receive money via agent between Kenya, Tanzania and Uganda
- Amana Money Transfer - send and receive money via agent between Kenya, Tanzania and Uganda
- Bakaal - send and receive money via agent between Kenya and Uganda
- Continental - can send money via agent, debit/credit card, bank account and receive via M-Pesa, Airtel money, bank account and agents between Kenya, Tanzania and Uganda
- Dahabshil - send money via agent and receive via agent and mobile money to across all EA countries except burundi.
- Mobicash in Rwanda allows users to send money to Kenya and Uganda

Other local registered MTOs were found to have inactive platforms and only acted as agents to international MTOs.

Box 1: Mystery shopper

In Kenya, the project team visited three money transfer agents to find out the costs of remitting to Uganda. Two of the three agent's systems were offline. The same was experienced in Uganda whereby one of the two agents that were visited was offline. It was found that the average cost of sending money within the EA region when using an MTO was 5%.

Some of information gathered from the mystery shopping experience includes:

Dahabshiil money transfer

- Dahabshiil money transfer allows money transfer to all EAC countries except Burundi
- The cost for money send is 5% of value

UAE exchange

- Allows money transfers with all EAC countries
- In Rwanda, it costs USD 4 to send USD 100 to Rwanda USD 100. The receiver receives UGX 351 591 (USD 96.1)

It is often suggested that there are significant informal money transfer services offered between the countries in the region - unfortunately there is little published research on their operations, and informal enquiries in the market areas conducted for this project did not identify any operators.

5.7. REGULATION AND LICENSING

With the exception of Tanzania and Rwanda, there is no specific regulatory framework that oversees and governs the operations of payments providers and standards. However, in every country, payments (physical and electronic) fall under the Financial Institutions or Banking Supervision Acts.

Across the EAC, both mobile money service providers and money transfer operators need to obtain approval from the country's respective central bank to provide electronic money service through an electronic money license, a money remittance license, forex license, or a combination of both. Interestingly, there are no definitive licensing arrangements for payment aggregators. In Kenya, Uganda, and Rwanda, there have been discussions to consider specific licensing requirements for payment aggregators. Note in Rwanda, the Access to Finance team is currently busy with two projects around payment aggregators or digital financial services, focusing on developing the regulation governing payment gateways and aggregators in Rwanda.

In Kenya, there are two types of licensing requirements that either allows an organisation to manage money transfers or operate as a forex bureau.

In Tanzania, mobile money operators and money transfer operators are regulated by the 'Overall NPS Act - 2015, Payment Systems (Licensing and Approval) Regulations - 2015 (The Licensing Regulations); and Payment System (Electronic Money) Regulation - 2015 (Electronic

Money Regulations)'. The actual requirement involves obtaining a payment system license, a payment instrument license, and an electronic money issuer license.

In Uganda, forex bureaus and money remitters fall under the '*Foreign Exchange (forex bureaus and Money remittance) regulations, 2006*', and is valid for one year. License applicants need to be clear if they are an international money transfer agency, forex bureau, money remitter, or sub-agency.

5.8. GENERAL SCHEMES

The main cross-border payments schemes that exist in the EAC market include the international card schemes (Visa and Mastercard), the regional payments systems (EAP and REPSS), money transfer operators and the small bilateral wallet to wallet type money transfers.

The majority of branded cards issued in the EAC are Visa branded, however, the presence of Mastercard is growing. Financial institutions are increasing accepting Union Pay cards. Although international cards are accepted in all the markets, usage has not reached scale, serving only the banked population (less than 20% of the population).

Banks have invested heavily into regional systems such as the EAPS and REPSS. Both systems provide the users with same day clearing and settlement, however, currently both platforms are mainly used for high-value payments. Technically, considering how the TARGET2⁷ system in Europe is currently being used for low-value type payments, the East Africa regional payments platform can be adopted for retail payments. Enabling such capabilities would require some standardisation in regulation, the balance of payment reporting, pricing and operations (e.g. compliance and participation in ISO20022). Unless MNOs are able to connect to such payment platforms (if need through partner banks), regional payment platforms would only serve the banked customers⁸.

MTOs (Western Union, Money Gram and UAE Exchange) have been able to fill the gap for small value cross-border money transfer, but at a relatively high cost to both the sender and user. MTOs typically work through a partner bank in each market for settlement of accounts, which typically adds to process and costs that are transferred to the end-user.

Other than the bilateral agreements between MNOs for cross border payments (see section 5.5), there are no multilateral MNO cross-border money transfer schemes. Before cross-border wallet to wallet schemes can be established, domestic schemes should be in place as well. Currently, only the Tanzania and Ugandan mobile money models (rules around pricing and operations) exist.

6. PAYMENT INSTITUTIONS

This section provides a high-level description of the nature of business, the business model and connectivities of the key institutions in the region. This section is divided into

⁷ TARGET2 is the real-time gross settlement (RTGS) system owned and operated by the Eurosystem. TARGET stands for Trans-European Automated Real-time Gross settlement Express Transfer system.

⁸ Currently studies are being completed in both Kenya and Uganda focusing on the appetite and demand for mobile payments interoperability.

clearing/switch companies and payment aggregators.

6.1. SWITCH AND CLEARING

Kenswitch was set up as a private company in 2002 and is currently owned by Loita Capital. Initially started as a switch for ATMs, it now provides a number of additional services real-time interbank transfers through Domestic Interbank Transfer Service (DITS), aggregator for agency banking, merchant POS, and card issuing and hosting. Kenswitch has established connections with banks, SACCOs, MFIs, MTOs. In the EAC, Kenswitch has integrated its ATM system with three East African switches namely Umoja Switch (Tanzania), Interswitch (Uganda) and R-Switch (Rwanda). Fees charged are KES 40 (USD 0.40) for a processing an ATM transaction.

The key challenge facing Kenswitch is the presence of multiple switches in Kenya (Interswitch and banks that rely on Visa/Mastercard). The recent launch of the new real-time P2P switch provider (IPSL) increases the competitive pressures for Kenswitch, particularly its DITS solution.

IPSL is the newest switch in Kenya, provides a real-time P2P account-to-account transfer service through PesaLink. PesaLink was officially launched by the KBA governor in February 2017. The service allows customers to send to any bank account via a proxy (card or mobile number) in under 25 seconds. Customers are able to send anything between KES 10(USD 0.1) and KES 999,999 (USD 9,516) through the platform. IPSL pricing model is to charge a fixed fee per transaction of KES 11.2 (USD 0.11), of which KES 5.6 (USD 0.05) is for the provider and the remaining is split with the issuer and acquirer. This KES 11.2 transaction/switch fee is waived for transactions below KES 500 (USD 4.76). To date it has integrated its platform to over 25 banks in the market with a combined customer base of 80%.

Interswitch (Kenya) came about with the acquisition of Pesapoint and Paynet in 2014, initially established to drive and manage ATMs in the Kenyan market, and currently operates 1,200 ATM locations, and over 1,300 agent locations in Kenya. Interswitch has integrated its services with over 20 banks across all tiers, MFIs and SACCOs in Kenya. It also provides cheque imaging and processing services to tier 3 banks. Interswitch is also connected to the other switches in Kenya. In the EAC, Interswitch Kenya is connected to Interswitch in Uganda, Rswitch in Rwanda, Umoja in Tanzania, and Paynet in South Sudan. Interswitch has partnered with Umoja switch to enable M-Pesa customers in Kenya and Tanzania to withdraw across the Umoja ATMs, although this service is not yet live.

Interswitch (Uganda): was formed when Interswitch Nigeria purchased Bankcom a company set up to provide ATM services in Uganda. Currently Interswitch connects a network of 325 ATMs in Uganda. Of these 10 are directly owned by Interswitch and 15 managed on behalf of other banks. Interswitch primarily provides connectivity between the banks for off-us ATM transactions. They do not currently provide switching or clearing for EFT transactions. The volume of transactions has been growing rapidly at around 30% per year and the switch currently handles around 400,000 transactions per month. Settlement is managed the the BoUCH. Bank customers are charged UGX 800 (USD0.22) shillings for transaction processing. Despite having been originally been established in 2004 the switch is not currently profitable.

As in other markets there are currently discussions in Uganda for the Uganda Bankers Association to establish a competing switch and the UBA is already progressing a project to create a common switch for agency banking services

The **Umoja Switch** company in Tanzania was formed by a consortium of the smaller banks and Business Connexion (BCX) in South Africa. The Umoja Switch company outsources, under license its technology and operations to BCX which operates the business. The business is principally involved in the management of a network of 200 ATMs. ATM's can be owned by a bank and managed by the switch or provided by the switch to a participating bank. The company is responsible for ATM monitoring and maintenance, switching and approval of transactions and sending settlement files to participating banking institutions. The pricing model is to charge all users for ATM transactions, and to share this revenue between the issuer and acquiring bank. Fees charged are TZS 500 (USD 0.22) for processing a transaction.

Like the other aggregators in the region the Umoja faces a number of challenges. Firstly although most of the smaller banks have joined the switch the larger banks (NMB, CRDB, and NBC) have not and are currently in discussions with respect to forming a competing national switch. The absence of these large banks starves the switch of volumes which compromises its viability. The business currently only drives ATMS for domestic cards and is not active in POS, EFT markets and does not connect to the mobile money products.

Rswitch is the national e-payment switch for Rwanda that was established in 2003 after Millicom International Payments Solution acquired Simtel. Over the years, Rswitch has expanded to serve as financial interoperable solution company in the Rwandan market. Additionally, they offer a variety of services to PSPs including ATM management and monitoring, card production, switching and management as well as enabling cardless payments. Rswitch plans to also process large-volume, low-value payments (including ETFs) in Rwanda. Rswitch has created a platform which has allowed all the banks, MFIs, SACCOs and MNOs to connect to them as participants. This connectivity has allowed full interoperability across all ATMs, POS terminals by either directly connecting to the banks or establishing a host to host connection with banks that have connections with other switches.

Cardless payments are also interoperable but to a limited extent. For instance, mobile money users across all MNOs are able to withdraw from Rswitch's ATM network but this limited to ATMs that are driven by Rswitch. Interestingly, unlike other markets in EA, users in Rwanda can send money from their accounts to other wallets and vice versa (mobile banking facilities in other East African countries only offer transfers between a user's own account and wallet). Rswitch also runs its own card scheme - SmartCash which is currently issued by 5 banks in Rwanda. 400,000 cards have been issued, accounting for around 45% of the card market in Rwanda. The cards are accepted all ATM networks and POS terminals. Rswitch also processes other internationally branded cards that are acquired by their network of banks - they process Visa and CUP transactions, route AMEX transactions and are planning to process Mastercard transactions. They also offer card management services to local banks that do not have their own switches. The switch currently uses ISO 8583 messaging standards but aim to move to ISO 20022 by 2018. It currently processes about 650 000 transactions per month. Rswitch clears all the card transactions that they locally process and send settlement files to BNR at T+1.

TBA Switch the Tanzanian's bankers association is in the process of establishing an inter-bank switch which will connect all banks and handle off-us ATM and EFT transactions.

6.2. PAYMENT AGGREGATORS

In addition to the companies that enable off-us ATM transactions and support inter-bank

payments there are a number of payment aggregator companies across the region that principally connect bank and MNO platforms

Cellulant was formed in 2004 with a focus on providing mobile content services such as music and news for the Kenya and Nigerian market. After experiencing low recovery on payments, the firm shifted their focus to providing the connections between banks and mobile money platforms. Cellulant currently serves 98 banks across Africa and is connected to the major MNOs in 32 countries. They link banks and MNOs to mobile banking platforms by providing the technology as a third-party (40% of clients) or end-to-end facilities (60% of clients). Across the countries, clearing happens on a real time basis while the frequency of settlement depends on bilateral agreements. Cellulant facilitates its own settlement through their settlement accounts in the respective clients' wallets and accounts.

In Kenya, the company is connected to the three major mobile money operators (Safaricom, Airtel and Equitel) and 13 banks including all tier one banks. Cellulant facilitates mainly bill payments and money transfers by linking merchants to MNOs and banks for payments collection. They also have been developing their own mobile application (Mulla). It currently handles 350,000 mobile money transactions per month with the value of transactions amounting to USD160 million. Charges vary based on agreements with different providers but are mainly made per transaction with the average charge amounting to 1% of the transaction value. Whether the charges fall on the end customer or merchant also depends on the agreements. Given the connections with the major MNOs, the application has the ability to facilitate mobile interoperability by enabling app users to send and receive money from different mobile money wallets.

In Uganda, Cellulant is connected to Ecobank, NCB, Stanchart, DTB for account-to-wallet. They are also connected to utility service providers such as Umeme, National Water and Sewage Corporation (NWSC) and DSTV as well as MNOs such as MTN and Airtel. The pricing models also depend on agreements with their respective clients. For instance, governments are not willing to pay for the services and hence all charges fall on the customer who would pay 4%-6% of the transaction value. Merchants that are willing to bear the full cost of the services would pay around 3%-7% of the transaction value. Services can be charged at a fixed price or per transaction but this relies on the capability of the client. Their system handles around 70,000 transactions per month.

Pegasus Technologies is a payments aggregator with a presence in Kenya, Tanzania and Uganda. They are mainly based in Uganda as all payments are processed in the Uganda office whereas other offices are only for administrative purposes. They are connected to all MNOs in the market (Airtel, MTN Uganda, Zantel and Africell) as well as banks such as Stanbic, Postbank, Centenary, DFCU and NC bank.

Pegasus is the main aggregator in the bill payments market, appointed as the main aggregator for NWSC and also connected to other major utility providers such as Umeme, DSTV, Kampala City Council and Makerere University. Additionally, the enable bulk payments for NGOs.

The payments they process can either be made through their client's or own platform (on USSD and App). For bulk payments, the clients only need to upload file with recipients' information. Pegasus uses APIs to connect to the different clients and use HTTPS for messaging but this depends on the client. The integration is supposedly seamless and only takes two weeks to finalize. The clearing is done on a real time basis but the settlement is handled by their clients. At the moment, Pegasus is in the process of completing PCI

compliance.

Maxcom Africa is an ICT integration firm that was formed in Tanzania in 2008 and started operation in 2017. The firm is wholly locally owned and is headquartered in Dar es Salaam. They also have extensive operations in Rwanda (since 2012), Burundi (since 2013) and recently Uganda (2017). Currently, the systems in each of the countries are not fully integrated, however, there are plans to do so. Maxcom is connected to the major MNOs (Zantel, Tigo, Vodacom, and Airtel) as well banks such as Exim Bank, Mwalimu Commercial Bank (MCB), National Microfinance Bank (NMB), DCB and Umoja Switch for connection to smaller banks. They are also connected to utility services providers such as DSTV, Zuku, Startimes, Azam TV, Dar Es Salaam Water and Sewerage Corporation (DAWSCO) and the Tanzania Electricity Supply Company (TANESCO). Additionally, the firm facilitates payments for the government such as taxes, fines and pensions. All transactions are facilitated through their payments gateway known as Maxmalipo. Integration to Maxmalipo usually involves connecting and adjusting to their clients' APIs and takes between two weeks to a month to complete.

Maxcom has about 15 000 POS terminals that are used to facilitate agency banking for cash in and cash out transactions. Banks connected to Maxmalipo are able to leverage the 15 000 pos network, as devices are compliant with Visa and Mastercard. The firm is expected to extend its operations through Maxmalipo ATMs. All transactions made through Maxmalipo are cleared in real time but the settlement process depends on the client. Some clients have pre-funded settlement account while others settle via a reconciliation process.

Selcom Tanzania was founded in 2001 as a prepaid airtime distributor for Celtel in Dar es Salaam region, Tanzania. Since then, they have broadened their services as an aggregator. They operate an independent network of point-of-sale (POS) terminals with more than 17,000 terminals countrywide for bill pay, cash-in, cash-out, and agency banking. Selcom has also connected more than 30 banks to mobile banking for core services. They are also connected to all MNOs in the market (Vodacom, Airtel, Tigo, Zantel, Smart, Tanzania Telecommunications Company Limited and Halotel) for account-to-wallet transactions. Additionally, they have enabled bill payments for 16 utility providers such as DSTV, TANESCO and Start Times by connecting them to all the MNOs in the market and a number of banks. The company also recently began operations in Uganda.

The Selcom POS network consists of card less and fully EMV compliant terminals with chip-and-pin and magnetic stripe card readers. The network allows integration with bank switches and cross-border remittances, enabling functions such as utility sales, cash-in/cash-out through mobile money wallets, merchant payments and card transactions. Selcom's Paypoint App supplements the POS network by allowing customers to carry out POS transactions via mobile. Selcom also has a brand of ATMs know as Cashpoint, which integrates mobile wallets and mobile banking products, allowing the top-up of, transfer between and withdrawal from any MFS. On average, they currently process 300,000 transactions on a daily basis through their channels.

Pivot Access is an aggregator in Rwanda formed in 2007. The company that started by buying prepaid electricity in bulk from the utility company and reselling it to the consumer and businesses. The service further expanded when they introduced agents to sell units on their behalf, provided an app and POS machines for transactions and later integrated mobile banking and mobile money.

Pivot Access offers push and pull services that enable integration between banks and MNOs.

The services offered include: bill pay via mobile money or mobile banking, transfers between wallets and accounts, transact with bank agents from either wallet or account. In addition, Pivot helps banks with the reconciliation of all e-payment transactions and facilitates their systems to communicate with the Central Bank's RTGS. Pivot Access has completed integrations to banks such as LandM, Bank Of Kigali, Ecobank, Banque Populaire de Rwanda, Development Bank of Rwanda, Cogebanque and Crane Bank. They are also connected to Tigo, Airtel and MTN as well as utility service providers such as Startimes.

Pivot access clears all transactions in real time and reconciliation happens via pre-funded accounts that clients hold with the firm. Reconciliation may take place every other day or weekly, depending on the agreement with the client.

Yo! Payments provides mobile payments aggregation services in Uganda. They enable businesses to receive mobile money payments and also allow account-to-account transfers between Yo account holders. They charge 3% of the transaction value for inbound mobile money transactions whereas a flat rate of UGX 390 (USD 0.1) and UGX 300 (USD 0.08) for outbound mobile money transactions to Airtel and MTN respectively. Bulk payments are also charged at a flat rate of UGX 250 (USD 0.07).

7. KEY ISSUES AND IDENTIFIED STRATEGIC QUESTIONS

This study has identified a number of **key characteristics** of the payment infrastructure in East Africa

- The market is **bifurcated** between **banking systems** which are gradually replicating the payment infrastructure common in most markets (with ATM service providers, and interbank switching companies) and the **mobile money platforms** that are increasingly connected using their own bilateral clearing and settlement agreements. The connectivity between these two worlds being provided by specialist payment aggregators.
- There are number of **private companies** that facilitate interoperability between ATMs in each market (Umoja, Interswitch, Kenswitch, Rswitch). Generally these companies have failed to achieve commercial scale due to the fact that not all banks use their services and due to the relatively low volume of payments in the markets, and as they mainly provide services for a single payment stream (off-us ATM services).
- Many of the larger banks in the market continue to use **Visa/Mastercard** to enable off-us ATM services, but price these services at a premium. These banks have been reluctant to support private switches due to the costs charged.
- Much of the growth in the market has **been connecting banks to MNO platforms** and a number of providers have been established to service these markets. Such providers generally have better economics as they have considerably higher volumes, and are increasingly offering bill payment services.
- In each market there are moves to establish **national switches** led by the bankers association that will provide real time and lower value ATM and EFT switching / clearing and bill payment services. However such switches will also struggle to cover costs unless the use of EFT's rises rapidly or these switches provide other services

such as connectivity for agency banking or ATM transactions, bringing them into conflict with the private companies. These switches operate on a utility basis (cover costs) and are/will be owned by the banks through the bankers associations.

- Most domestic off-us payments between MNO mobile money products are cleared and settled through **bilateral agreements between the MNOs**. As there are only two to three MNOs in each market they have hitherto not required a “switch” given the number of bilateral connections involved.
- **Cross-border payments** between banks are mainly affected through correspondent banking relationships despite the establishment of a regional clearing and settlement systems. This is probably as a result of the relatively low level of intra-regional trade in overall trade.
- **Cross-border payments between MNOs** are currently largely handled by a private company - MFS Africa - that provides connectivity and clearing information to participating MNOs’.

The result of this **fragmented system is a relatively low use of domestic infrastructure**, problems with the financial sustainability of the infrastructure providers and **high costs to the participants**.

The table below compares the cost of clearing/switching services provided by the different market participants with the “affordability” benchmark established earlier in the report.

Table 14: Cost of transaction processing and % of GDP per capita

Provider	Charge to process transaction (USD)	% of GDP per capita (x100)	Multiple to best target
Kenswitch	USD 0.4 per transaction (ATM)	0.58%	21
Interswitch U	USD 0.23 per transaction	0.65%	23
Interswitch K	USD 0.23 per transaction	0.35%	12
Umoja Switch	USD 0.22 per transaction varies with amounts	0.71%	25
RSwitch	USD 0.12 per transaction	0.58%	17.6
IPSL Kenya	USD 0.056 per transaction	0.16%	5
Bankserv	USD 0.015 per transaction	0.03%	1
Visa/Mastercard	USD 0.025 per transaction	0.05%	2

What this table dramatically highlights is that there is a significant gap between what institutions are charging to process transactions and some regional and global benchmarks and relative to what can be afforded if consumers are to adopt payments products.

The calculations in the introduction suggested that for all participants in the payments value chain to cover their costs and for payment services to be affordable to users, switching services should achieve a cost per transaction of between USD0.02 and USD 0.06. Within the region this is only currently achieved by IPSL in Kenya.

Part of the challenge with respect to these competing infrastructure are conflicting sentiments concerning the role of private providers as “national” switches. Globally most national switches are owned collectively by the banking industry and for good reason. As a national switch is often a **natural monopoly** the users of the switch have a strong incentive to ensure that such pricing power is not abused. Equally Central Banks are typically involved to ensure that access

to the switch is not controlled by any specific group (or groupings of larger banks) and that the pricing of such services do not discriminate against smaller players in the market.

Currently the payments environment in East Africa is complicated by the size and volume of transactions that occur both **between MNO's and between Banks and MNO's**. Currently intra-MNO transactions are handled bilaterally at a national level, creating some settlement risk, and with Bank/MNO transfers handled by aggregators that operate as entities distinct from both the ATM payment aggregators and the nascent national switches. There is little likelihood at present of the MNO payments being handled through the bank payment switches as they operate **according to different payment messaging standards**.

For **cross-border payments** despite recent initiatives by the central banks to create the East African Payment System using local currencies and the REPSS most interbank payments continue to rely on correspondent banking relationships as regional trade is such a small portion of each country's overall trade. In the retail market cross border payments are increasingly possibly using mobile money products. The cost of these services is below that of conventional money transfer products and thus the limited use of the services is probably more to do with customer knowledge of the product and the "clunkiness" of the solutions offered in some instances.

This suggests a number of **strategic questions**:

- The capabilities of **both sets of aggregators could be integrated with a national switch** in each market, although the commercial interests of all parties would need to be aligned, as would the messaging standards. The emerging national switch will further reduce the economics of the aggregators.
- Although within each country there are not enough network participants to justify a regional MNO switch, taking a regional view, **a regional MNO switch** would simplify the implementation of interoperability rules, reduce the cost of establishing connectivity between players and reduce some of the settlement risks involved in the current system. MFS Africa is well positioned to play such a role but an **appropriate Governance regime** would be required to avoid market dominance. This is also due to lack of a counter regional regulatory body to prevent abuse of pricing power.
- If **common payment house clearing rules and payment message standards** could be established then it would make sense to think of a **regional switch providing services across card, EFT, bank/MNO connections and between different MNO**. The establishment of such an entity would need **considerable engagement and coordination** between the **central banks** in the region and the **respective bankers associations**. **Our engagement with the bankers associations suggests a low level of interest in such a platform**.
- The **commercial consolidation of the ATM switches** across the region could reduce costs by consolidating the ATM management, and back office processing capabilities.
- There is a further opportunity for **consolidating / integrating the companies that currently provide the connectivity between banks and MNOs with the ATM payment service providers**
- With the move to **truncation** in cheque clearing, some of the **ACH functions across the region could be merged to reduce costs**.

The Role of Development Partners

The foregoing analysis highlights how the combination of small markets, a wide range of payment instruments and a fragmented payments infrastructure in the region result in the provision of payment services that are too expensive to further the aims of creating deeper and broader financially inclusive use of financial services.

The strategic questions raised above suggest that development partners can play a number of important roles in creating a more integrated infrastructure that operates at lower cost.

- Development partners with private sector investment capabilities can play the role of **impact investors** to bring about the consolidation of the various private switches and national switches.
- Those partners with **advocacy capabilities** can assist the Central Banks in the region to develop a vision and roadmap towards a **single payments area for East Africa** that can operate at a different speed to currency integration.
- Where **grants are provided to infrastructure providers** these grants should be informed by the need to integrate and consolidate infrastructure at a regional level rather than subsidise its fragmentation.
- Continued support to the **competition and regulatory authorities** is required to ensure the development of a payment system that is not subject to monopoly pricing.

APPENDICES - GLOSSARY OF ABBREVIATIONS

BNR - Banki Nkuru Y'u Rwanda: translated as the National Bank of Rwanda.

BOT -- Bank of Tanzania.

BoU - Bank of Uganda.

BoUCH - Bank of Uganda Clearing House: infrastructure that is used to clear cheques and low value Electronic Fund Transfers (EFTS) in Uganda.

CBK - Central Bank of Kenya.

DITS - Domestic Interbank Transfer Service that is operated by Kenswitch.

EAPS - East African Payments System: enables money transfer through RTGS across Kenya, Rwanda, Tanzania and Uganda in the local EAC currencies.

ECS - Electronic Clearing System: clears and processes cheques in Uganda by verifying data and preparing clearing files. The system will be moved into an Automated Clearing House once cheque truncation has been implemented.

EFT - Electronic Fund Transfer: electronic exchange or transfer of money from one account to another, either within a single financial institution or across multiple institutions, through computer-based systems.

IPSL - Integrated Payments Services Limited: a switch established by Kenya's Bankers Association. IPSL is the owner of PesaLink, a product that allows customers to send money from one bank account to another in real-time.

KEPSS - Kenya Electronic Payments and Settlement System: the Real Time Gross Settlement (RTGS) system in Kenya.

NACH - Nairobi Automated Clearing House: infrastructure is used to clear cheques and low value Electronic Fund Transfers in the Kenya.

REPPS - Regional Payment and Processing System: enables cross border high value payments between countries in the COMESA region.

RIPPS - Rwanda Integrated Payments Processing System: the Real Time Settlement system in Rwanda that comprises of an Automated Transfer System (ATS) and a Central Security Deposit (CSD).

RTGS - Real-time gross settlement: continuous (real-time) settlement of funds or securities transfers individually on an order by order basis (without netting).

SIRESS - SADC Integrated Regional Settlement System: the regional cross-border settlement system for SADC countries.

SWIFT - Society for Worldwide Interbank Financial Telecommunication: provides a network that enables financial institutions worldwide to send and receive information about financial transactions in a secure, standardized and reliable environment.

TACH - Tanzania Automated Clearing House

TISS - Tanzania Interbank Settlement System: the Real Time Gross Settlement (RTGS) system in Tanzania.

UNIS - Uganda National Interbank Settlement: the Real Time Gross Settlement (RTGS) system in Uganda.

APPENDICES - INDUSTRY STAKEHOLDERS AND PROJECT CONTACTS

Kenya

Role	Institution	Contact Person	Position
Switch	Interswitch	Paul Ndichu	CEO
	IPSL	Jennifer Theuri	CEO
Banks	Guardian Bank	Bharti R. Patel	
	Stanbic	Brad Gillis	Head of Payments
Mobile money services aggregators	MFS Africa (for all markets)	Dare Okoudjou	CEO
Aggregators	Cellulant	David Waithaka	COO
Donors	FSDK	Victor Malu	Head of Payments
		Juliet Mburu	Project Manager: Payments

Uganda

Role	Institution	Contact Person	Position
NPS Department	NPS	Bisaso Kizito	Assistant Director - Banking supervision
ICT Authority	NITA-U	Augustine Sskekyondwa	Application Architect
Local switch	Interswitch	Olumuyiwa Asagaba	CEO
Mobile money services aggregators	Pegasus	Dennis Mushabe	Integrations Manager
	Cellulant	Anita	Country rep
Donors	FSDU	Renita Nabisubi	Innovative Financial Services Specialist

Tanzania

Role	Institutions	To meet	Position
NPS Department	NPS	Bernadad Dadi	Director
	Oversight and Policy	James Masoy	Manager
Local switch	Umoja	Seronga Wangwe	MD Tanzania
Banks	Stanbic	Brad Gillis	Head of Payments
		Albert Swai	Head of Self Service Channels
	NMB	Ineke Bussemaker	CEO
Mobile money services aggregators	Maxcom	Rob Ashley Madziva	Director-Business Development

Rwanda

Role	Institutions	To meet	Position
Switch	Rswitch	Catherine Catherine	Head of Projects
	Rswitch	Lucy Kerubo	Head of Business Development
Donor	Access to Finance	Jean Bosco Iyacu	Financial Inclusion

APPENDIX C: SUMMARY TABLE OF STAKEHOLDER PARTICIPANT BUSINESS

Name of company	Clients	Business model	Services offered	Channels	Benefits	Limitations	Main ownership
Kenswitch	Banks	Volume driven business	Mainly ATM switching, recently introduced DITS		-	Banks only, and not connected to all.	Banks
IPSL	Banks	Volume driven business	Instant real-time account to account payments through a look-up table	Banking application, Online, ATM, Agent	Real-time competitive pricing structure.	Limitation, currently only available for banked customers	Banks
Interswitch	Banks	Volume and value driven business	ATM, POS, card, and electronic money management and processing	ATM, Card and Online payments	Physical presence in Uganda and Kenya. There is a pipeline to open Verve cards on its network.	Privately owned company	Privately owned
Umoja	Banks	Volume and value driven business	ATM monitoring and maintenance, switching and approval of transactions and sending settlement files to participating banking institutions	ATM	-	ATMS for domestic cards and is not active in POS, EFT markets	BCX
Rswitch	Banks and MNOs	Volume driven	Card embossing, management and processing. ATM driver and management. Busy piloting with mVisa	ATM and POS	Only switch in Rwanda	Ownership structure may prevent interoperability	Majority Millicom

Name of company	Clients	Business model	Services offered	Channels	Benefits	Limitations	Main ownership
Cellulant	Banks, MNOs, utility companies and corporations	Depends on client, but mostly value driven	Paybill, mobile banking. payments and collections, and airtime. Cellulant is in the process of building its own mobile integrated payments app.	USSD and mobile app	Is present in Kenya, Uganda and Tanzania	-	Privately owned
Pegasus	Banks, MNOs, utility companies and corporations	Depends on client, but mostly value driven	Bill payment, Merchant POS, Banking integration, and Business solutions (payments and collections).Go digital and start accepting Mobile Money payments at your business today with PegPay. Provides mobile bulk payments.	USSD, POS and mobile app. Bulk payment files are uploaded by client through a merchant online portal.	Main payment aggregators for the Uganda's energy company (UMEME), all other aggregators need to connect to Pegasus for UMEME payments. Currently connects MTN Uganda and Airtel to drive interoperability	-	Privately owned
Maxcom	Banks, MNOs, utility companies, transport and corporations	Depends on client, but mostly value driven	POS, ATM (soon), online payments, merchant payments, mobile banking, payment gateway services, utility and service payments, transportation payments, taxes, and eHealth services	USSD, POS and mobile app. Bulk payment files are uploaded by client through a merchant online portal.	Provides access for abnks to its 15 000 agent POS network	POS mainly used for cash-in cash out	Local private ownership