



Tracking the journey towards mobile money interoperability

Emerging evidence from
six markets: Tanzania, Pakistan,
Madagascar, Ghana, Jordan
and Uganda

June 2020



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Abbreviations

A2A	Account-to-Account
BoG	Bank of Ghana
BoU	Bank of Uganda
BoT	Bank of Tanzania
CBJ	Central Bank of Jordan
CGAP	Consultative Group to Assist the Poor
Cross-net	Across MNO networks
ECOWAS	Economic Community of West African States
IFC	International Finance Corporation
GhIPSS	Ghana Interbank Payment and Settlement System
JoMoPay	Jordan Mobile Payments
JoPACC	Jordan Payments and Clearing Company
KYC	Know your customer
MNO	Mobile Network Operator
MMP	Mobile Money Provider
MPG	Micro Payment Gateway
On-net	On the same MNO network
OTC	Over-the-counter
P2P	Peer-to-Peer
PSP	Payment Service Provider
SBP	State Bank of Pakistan
TIPS	Tanzania Instant Payment System



Executive summary

Over a decade ago, mobile money emerged as a standalone service for consumers on the same mobile operator network. Since then, widespread use and uptake of mobile money has led to integration in broader payment infrastructures, connecting a variety of financial services providers. In this context, account-to-account (A2A) interoperability gives mobile money customers the ability to make a transfer between two accounts held at different mobile money providers (MMPs) or between an MMP and a bank. In markets where mobile money is live, A2A interoperability is on the rise.

To leverage and accelerate the success of mobile money, both new and existing payment infrastructures will need to introduce and implement A2A interoperability in alignment with the mobile money business model, which is predicated on high volumes of low value transactions. Doing so will not only sustain mobile money use cases, but also make it commercially viable for MMPs to offer financial services to underserved population segments at scale.

Across the globe, national and cross-border payment infrastructures are typically comprised of legacy systems designed to promote high-value and electronic transfers for the banking sector, where profitability is tied to high-value or interest-based use cases. The growing prominence of mobile money, however, calls for a reimagining of payment infrastructures—ones which adapt and integrate the operational and commercial realities of MMPs, including mobile network operators (MNOs).

Interoperability models that prioritise the realities of MMPs will incentivise greater participation from the mobile industry and foster uptake of interoperable transactions. Increased interoperability

stimulates the circulation of digital values in payment ecosystems, advances government priorities for cashless economies and offers a range of benefits for end users, from greater convenience to positive socioeconomic outcomes.

Emerging evidence suggests that mobile money A2A interoperability can flourish in markets where MMPs lead decision making on operational rules and governance, particularly when involving integrations with MNOs. Early insights also highlight the importance of having an enabling regulatory environment that allows MMPs to make commercially viable business decisions about interoperability. Fostering favourable conditions allows MMPs to implement interoperability in a way that is commercially appealing and user friendly to consumers, which will be essential to increasing the uptake of use cases across networks.

Collectively, these findings reveal that the success of an interoperability initiative depends on having appropriate governance structures and commercial models in place in advance of commercial launch and technical implementation. Sufficient time and resources should be allocated to defining governance and business rules to allow for the successful uptake of interoperable transactions when interoperability is functionally in place.

The GSMA encourages mobile money interoperability and will continue to support models that are contextually relevant, commercially viable and sustainable for the mobile industry over the long term. MNOs are equally committed to identifying and implementing solutions tailored to the mobile money business model.



1.0 Introduction

Mobile money is increasingly ubiquitous in emerging markets. As of December 2019, over 290 mobile money services were live in 95 markets across Africa, Asia, Latin America and the Middle East, collectively unlocking financial access for hundreds of millions of people.¹ Today, consumers are using mobile money as part of their daily activities and across a variety of use cases, including domestic peer-to-peer (P2P) transfers, airtime top-ups and payments for bills, goods and services. Governments and businesses rely on mobile money for bulk disbursements, including social welfare and pension benefits, supply chain expenditures, and salaries and wages.

Mobile money has a far-reaching impact. For the financially excluded, mobile money enables formal entry into a financial system while making it easier to pay for a child's school fees. By offering the unbanked or informal businesses a foundation for a digital footprint, mobile money transaction records can open access to adjacent financial services, such as savings, credit and insurance. Mobile money is extending access to financial services to women, while also offering new payment options for basic utilities, such as water and electricity.

The widespread use of mobile money is leading to broader and more sophisticated use cases. When mobile money services first launched, end users were confined to transactions within the ecosystem of their mobile provider. This largely meant buying airtime top-ups and performing P2P transfers in a “closed-loop” environment with customers on the same network.

In the realm of mobile money, interoperability enables customers to make a transfer between two mobile money accounts held at different mobile money providers (MMP) or between an MMP and a bank.

This concept is known as account-to-account (A2A) interoperability.² The interoperable functionality marks a significant departure from a previous environment, where mobile money— much like the early days of voice and SMS — was confined to the internal processing remits of a single provider.

While the growth of mobile money interoperability indicates that the service is becoming increasingly relevant in both national and international payment ecosystems, the journey has been complex. There are different approaches to interoperability, and stakeholders can arrive at implementation from a variety of directions.

This report features the interoperability journeys and lessons of six countries: Tanzania, Pakistan, Madagascar, Ghana, Jordan and Uganda. We focus largely on mobile money integrations between MMPs and offer insights on the experiences of these markets, which are at different stages of an interoperability process. While some have relatively mature A2A interoperability solutions, others are just entering their implementation phase. As different approaches to interoperability are attracting more attention, this report will first clarify some topics of importance as they relate to interoperability, such as financial inclusion, competition and agent interoperability.

1. GSMA (2019), [State of the Industry Report on Mobile Money](#).

2. Clark, D and Camner, G. (2014), [A2A Interoperability: Making Mobile Money Schemes Interoperate](#). Consult Hyperion and GSMA.

1.1 Assessing the A2A interoperability journey in six focus markets

To better understand progress towards mobile money interoperability, the GSMA commissioned Sofrecom to conduct a series of in-country assessments. With the aim of building the evidence-base on lessons learned to-date, the report uncovers insights into regulations, governance structures, business models, consumer pricing and user experience. For a detailed account of the technical architecture of interoperability models, please see our companion report, *The Many Paths to Mobile Money Interoperability: Selecting the Right Technical Model for Your Market*.³

This report focuses on mobile money A2A interoperability in six markets—Tanzania, Pakistan, Madagascar, Jordan, Ghana and Uganda—and the

realities on the ground as industry, government and regulators navigate the selection and implementation of different interoperability models. A brief description of the rationale and methodology for the market selection can be found in Section 4.⁴

The study employed a mixed-method analysis including 32 key informant interviews, both remote and in country, as well as desk research. Field visits and interviews were conducted between December 2019 and February 2020 and may not reflect subsequent changes to the market or service, including the impact of COVID-19.

1.2 Current state of mobile money interoperability

Like other payments infrastructures, mobile money began as an innovative proprietary solution that allowed people to send and receive money with other users of the same service. In many countries, mobile money was initially a standalone tool, not connected to a centralised third-party platform and largely separate from other sources of digital funds.

This has changed, of course, and today's mobile money industry is increasingly interoperable. Of the 95 markets where mobile money services are live,

48 have interoperability with either a bank or MMP (see Figure 1).⁵ On average, mobile money providers with bank integrations are connected to 13 banks. Real-time interoperability between accounts at different MMPs is available in 19 countries, a dramatic increase from just one market in 2013. Interoperable P2P transfer volumes have also grown by nearly 40 per cent between 2018 and 2019 without an impact on existing on-net P2P transfers in these markets.

3. Nautiyal, A. (2020) *The Many Paths to Mobile Money Interoperability: Selecting the Right Technical Model for Your Market*. GSMA.

4. Against the backdrop of COVID-19, mobile money is proving to be an invaluable tool for fostering resilience by facilitating safe and efficient money transfer and payment services. The mobile money industry's response to COVID-19 includes significant measures involving fee waivers for interoperable transfers, P2P transactions and interchange fees, as well as support to agents, many of whom have been deemed to provide an essential service. This is coupled with regulatory responses that relax KYC and customer on-boarding requirements. Much of these responses occurred shortly following data collection for this report and, while they fall outside the scope of this analysis, they are outlined in a publication specific to COVID-19:

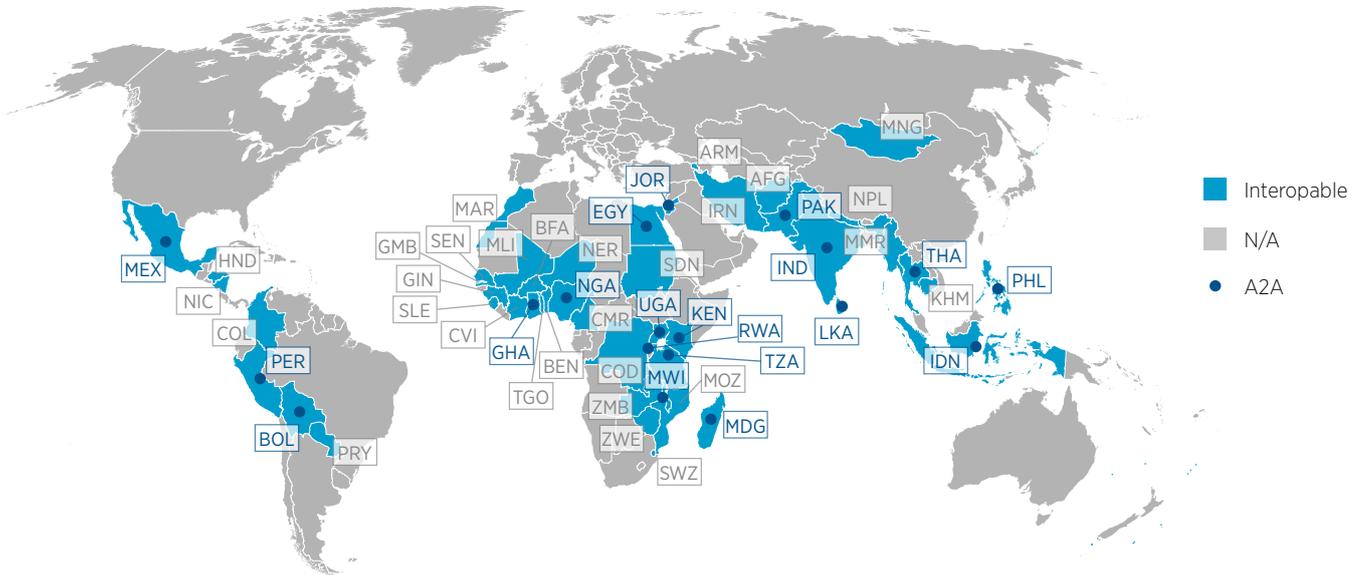
Muthiora, B. (2020). [Mobile money recommendations to Central Banks in response to COVID-19](#). GSMA

5. GSMA (2019), [State of the Industry Report on Mobile Money](#).



Figure 1

The global landscape of mobile money interoperability



Mobile money interoperability is also extending beyond borders. In 2019, mobile money-enabled remittances grew by 33 per cent, rising to USD 7.3 billion.⁶ This growth has been driven

primarily by strong provider appetite for cross-border interoperability and integrations with traditional remittance service providers (RSPs).

Figure 2

Snapshot of mobile money interoperability trends in 2019

48
95
48 of 95 markets are interoperable

Interoperability with banks

Mobile money services with bank integrations are connected to 13 banks on average

Mobile money account-to-account (A2A) interoperability

Interoperable P2P transfer volumes have grown by nearly 40%

Beyond domestic interoperability and integrations with banks

\$7.3 billion mobile money-enabled international remittances have been processed

6. Ibid.

2.0

Why interoperability is important

The prevalence of interoperability is significant for two main reasons. First and foremost, A2A interoperability makes P2P transfers, the most common mobile money

use case, more convenient. Second, interoperability between mobile money accounts and bank accounts stimulates more payments in digital form.

2.1 How interoperability is transforming the basic P2P transfer

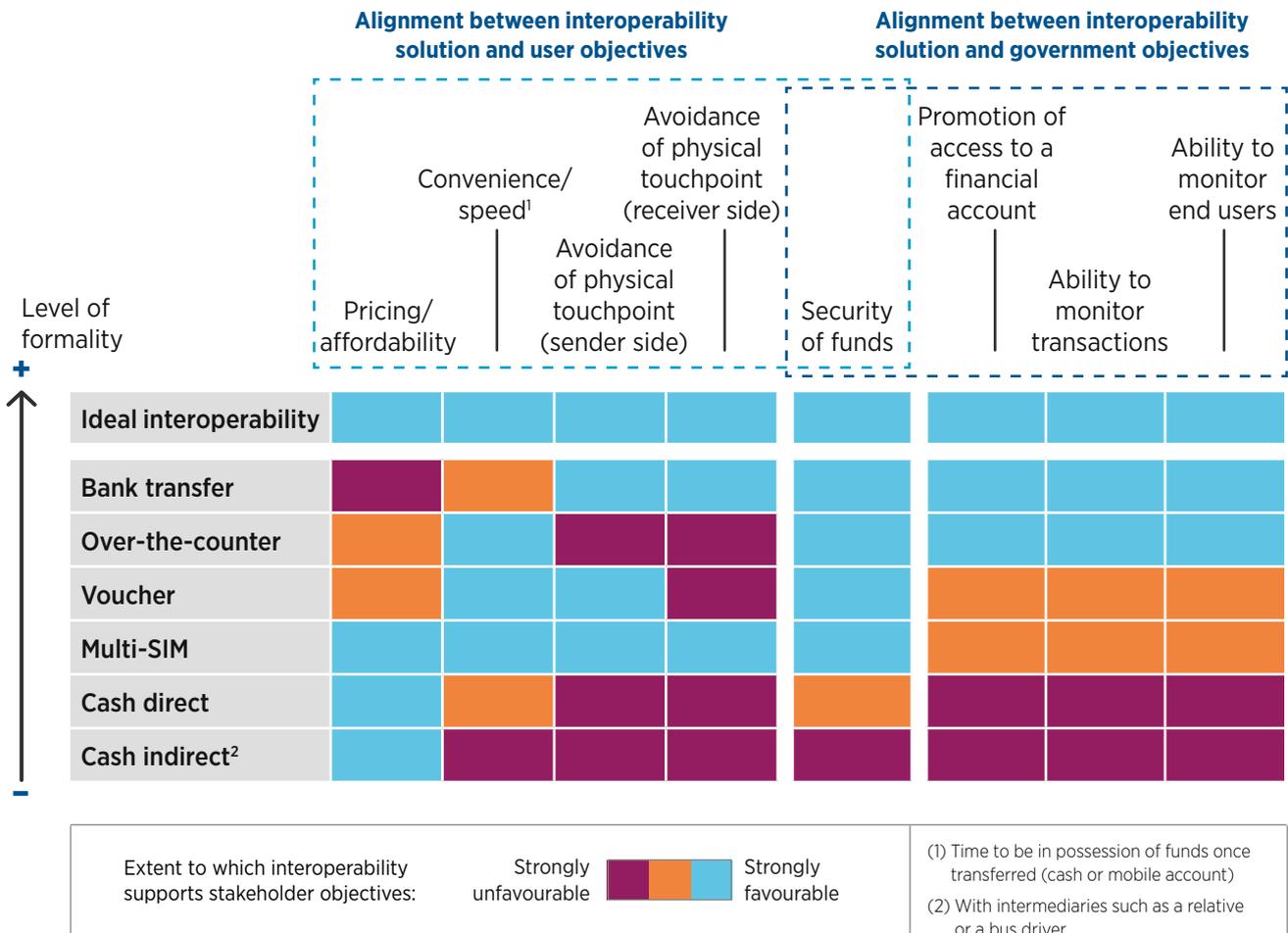
A2A interoperability is inherently more convenient for end users because it opens access to customers outside a mobile money provider's network. Prior to A2A interoperability, P2P transfers for end users on different networks were largely conducted off-net through alternative channels ranging in formality. This includes over-the-counter (OTC) transactions, vouchers and multi-SIM behaviour.⁷ Since these alternatives are less convenient, they can simultaneously promote the continued use of cash.

Meanwhile, A2A interoperability yields P2P payments that are faster, more convenient, more affordable and more secure. As Figure 3 shows, interoperability also advances government priorities for inclusive digital economies by expanding access to financial accounts,⁸ making funds more secure and improving the capacity to monitor domestic and international transactions.⁹ A2A interoperability is therefore mutually beneficial to both consumers and governments by aligning their respective interests and objectives.

7. For a more detailed account of less formal peer-to-peer channels in a context without A2A interoperability, see Appendix 1.
8. Bank for International Settlements and World Bank Group (2016), [Payment aspects of financial inclusion](#).
9. G20 (2016), [G20 High Level Principles for Digital Financial Inclusion](#).

Figure 3

Trade-offs for end users and governments with interoperable and alternative P2P payments



2.2 How interoperability stimulates a dynamic digital payment ecosystem

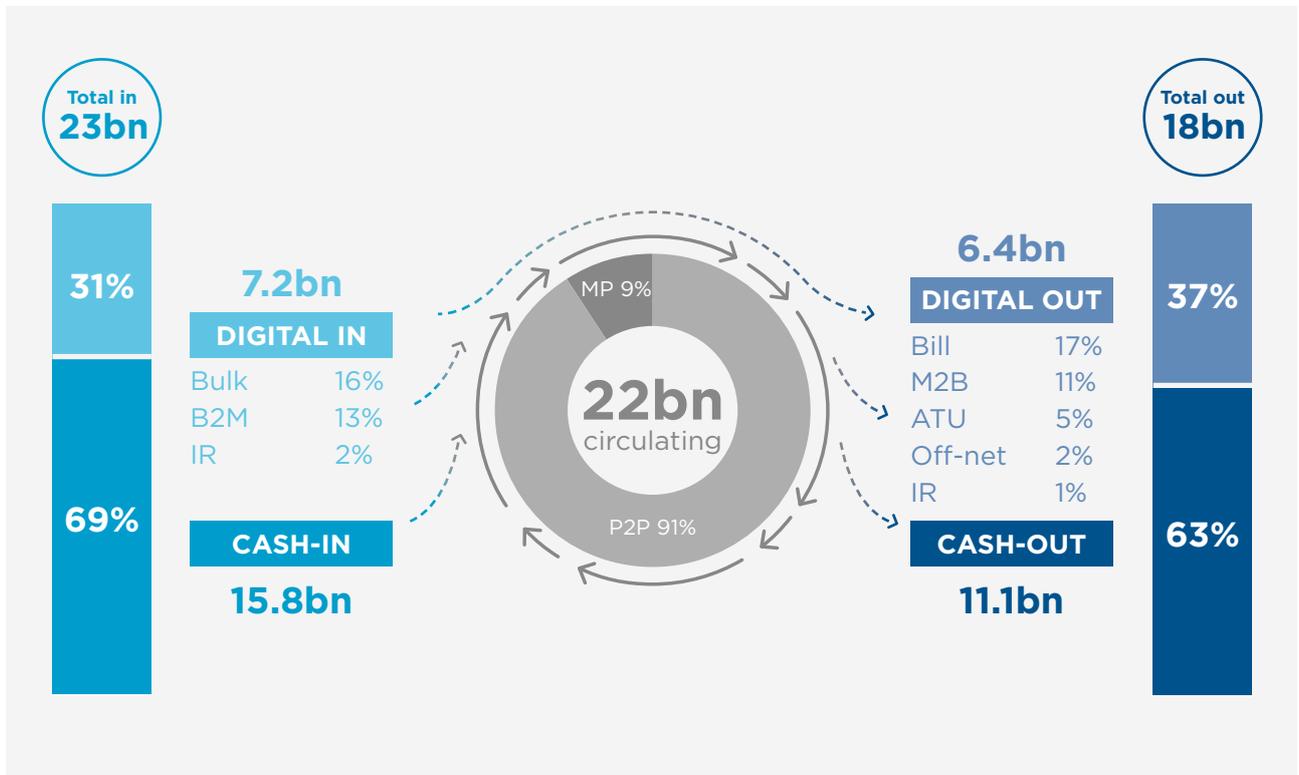
Interoperability is enabling more funds to enter and leave the mobile money system in digital form rather than through cash conversions (see Figure 4). In 2019, transfers between bank accounts and mobile money accounts (B2M) represented 13 per cent of value entering the system, while transfers between mobile accounts and bank accounts (M2B) represented 11 per cent of value leaving the mobile money system. By expanding consumer choice,

interoperability is contributing to one of the key trends in the mobile money industry in 2019: for the first time, digital transactions represent the majority of mobile money flows (57 per cent).¹⁰ For these reasons, interoperability has the potential to drive positive long-term network effects, similar to automated teller machines (ATMs), automated clearing houses (ACH) and debit and credit payment cards.¹¹

11. Clark, D and Camner, G. (2014), [A2A Interoperability: Making mobile money schemes interoperate](#). Consult Hyperion and GSMA.

Figure 4

The ins and outs of mobile money¹²



12. More money is entering the mobile money ecosystem, both in cash and digitally, than exiting. [Digital transactions: peer-to-peer (P2P) transfers, international remittances (IR), bank-to-mobile (B2M) transfers, bill payments (Bill), bulk disbursements (Bulk), mobile-to-bank (M2B) transfers, merchant payments (MP) and airtime top-ups (ATU)]; [Cash-based transactions: cash-in and cash-out]. Source: Naghavi, N. (2019), [State of the Industry Report on Mobile Money](#). GSMA.



3.0

Demystifying common assumptions about interoperability

Given the growing interest and discussions around interoperability, alignment on key concepts is essential. This requires examining and demystifying some commonly held ideas and, in some instances, misconceptions. Three areas merit attention: the

link between interoperability and financial inclusion; assumptions about interoperability and competition; the role of interoperability at the agent level, and; the opportunity for interoperability at the merchant level.

3.1 The connection between interoperability and financial inclusion

Interoperability is commonly considered a direct path to financial inclusion. However, it is important to recognise that even highly interoperable markets can exhibit low levels of financial inclusion. From the markets in our study, Pakistan stands out given both bank and mobile money interoperability for over five years, yet the country's unbanked population size exceeds 100 million.¹³ Similarly, Nigeria and Indonesia are two examples of markets that have seen progress with interoperability, particularly as regional leaders in fintech, yet both countries host some of the world's largest unbanked populations, which stand at over 96 million and 62 million respectively.¹⁴ A host of favourable socioeconomic and regulatory factors beyond interoperability contribute to achieving financial inclusion. Private sector players can contribute to aspects of financial inclusion in the event there is a commercial incentive to do so as part of their segmentation strategy or business model.

Financial inclusion is the process by which hard-to-reach and previously unbanked segments of

a population gain access to, and adopt, a formal payment account. MNOs play an instrumental role in accelerating financial inclusion due to their mobile money business model of low-value, high-volume transactions.¹⁵ Through investments in infrastructure that amplify connectivity through USSD and comprehensive agent distribution networks that extend their reach, MNOs can scale mobile financial services in a way that allows them to remain competitive. In emerging markets, remaining competitive with low margins can prove unviable for financial institutions relying on brick-and-mortar access points, or fintechs requiring internet and app-based applications. While both foreign and home-grown fintechs increasingly take on innovative models in emerging markets, their ability to effectively scale their reach beyond smartphone and urban segments remain questionable.

Given the significant upfront operational costs, mobile money services only become profitable when MNOs reach scale.^{16,17} This is because — unlike a bank that

13. The Global Findex Database. (2017). [Chapter 2: The unbanked](#). The World Bank

14. Ibid.

15. For a detailed synopsis of the availability, accessibility, adoption and use of mobile money services, see the GSMA's Mobile Money Deployment Tracker: <https://www.gsma.com/mobilemoneymetrics/>.

16. Almazán, M. and Vonthron, N. (2014), [Mobile money profitability: a digital ecosystem to drive healthy margins](#). GSMA.

17. Osafo-Kwaako, P., et al. (2018), [Mobile money in emerging markets: the business case for financial inclusion](#). McKinsey & Company



relies on interest earned on balances held, and the difference between the interest it pays on savings accounts and what it charges for loans to generate revenue— the mobile money business model is tied to the movement of value and, ultimately, transaction fees.^{18,19} If there is a clear case for profitability, an MNO will have an incentive to invest in deploying a mobile money service, including an agent network.

Financial inclusion, therefore, depends more on having a mobile money service available than interoperability. Accordingly, any interoperability process that layers new and additional costs onto the mobile money business model can introduce disincentives that make it commercially unviable for MMPs to reach the underserved and those in the “last mile”.

3.2 Assumptions about interoperability and competition

When it comes to A2A interoperability and competition among MMPs, views are mixed. Some MMPs believe that interoperability discourages competition. Under this view, interoperable transfers eliminate the need for multi-SIM behaviour and, in turn, incentivises customers to stay on the network they have always used. In this scenario, reduced exposure to alternative providers may thwart the ability of MMPs to attract new customers. Meanwhile, a conflicting perspective held by ecosystem actors suggests that A2A interoperability encourages consumers to consider different providers since they no longer need to remain on the same

network. Under this view, an interoperable market allows consumers to choose a provider based on product differentiation and quality of service.²⁰

However, there is currently no empirical evidence that the functional presence of A2A interoperability affects an MMP’s position in a market. In Tanzania, for example, Vodacom has maintained market share despite interoperability with its M-PESA mobile money service since 2016.²¹ Similarly, in Ghana, MTN is still the market leader despite interoperability between mobile money providers since 2018.

3.3 The role of interoperability at the agent level

Agents are a core asset in the mobile money business model. They play a critical role in digitising cash and on-boarding and educating new customers. MMPs make considerable investments in their agent networks which, as of 2019, have seven times the reach of ATMs and 20 times the reach of bank branches.²²

Markets with both mobile money services and A2A interoperability often include specific regulations governing the role of agents. An important one is whether agents represent a single MMP exclusively

or a range of mobile money services through a non-exclusivity arrangement. Agent non-exclusivity encourages and maintains healthy competition and incentivises MMPs to continue to innovate. In this context, agents are trained by different providers and access separate floats from MMPs through accounts corresponding with each mobile money service.

Today, there is a growing call for interoperability at the agent level. Agent interoperability—often misleadingly used interchangeably with agent non-

18. Mobile money deposits sit in trust accounts for safety and security purposes, and this also ensures an equivalent value is always available in currency form.
19. Swanepoel, R. (2019). [Future-proofing mobile money: thoughts on interoperability](#). Vodacom Public Policy Series.
20. Nègre, A. and Cook, W. (28 February 2019), [Should funders support switches for mobile payment interoperability?](#) CGAP Blog.
21. Of the six markets in this study, Tanzania and Pakistan offer publicly available information depicting market share in terms of mobile money accounts and subscriptions, although Pakistan discontinued disaggregated reporting on branchless banking in 2018. See Appendix 3 for the latest figures in both countries.
22. GSMA (2019), [State of the Industry Report on Mobile Money](#).

exclusivity—involves the sharing of a single float by non-exclusive agents, which could however lead to exclusivity by design. Although this has yet to occur, it is important to note that sharing agent floats can be a commercial disincentive for MMPs because monitoring, managing and rebalancing them are cumbersome tasks.²³ Requiring floats to be shared would lower return on investment considerably and

make MMPs less willing to build and sustain an agent network. While third-party float aggregators offer solutions that can mitigate the common liquidity challenges faced by individual agents, their services are largely confined to urban settings. While the MNO agent business model is scalable and can extend to harder-to-reach areas, it is costly to maintain.²⁴

Box 1: Expanding on agent interoperability



Agent interoperability explained

The availability of a mobile money service in both urban and rural settings is a key differentiator that incentivises and drives the mobile money business model. Therefore, steps taken by MNOs to ensure float availability and liquidity management reflects a principal investment and deliberate strategy, one that both prolongs commercial success and encourages continued expansion into additional remote areas that remain underserved.

In addition to product differentiation through investments in agent float and liquidity management, agent interoperability surfaces the following concerns for MMPs:

- Sharing a single float can increase competition between providers at the agent level which can increase costs and force MMPs to drive up agent commissions. This can impact consumers through higher fees for various services;
- Agent interoperability does not create any material benefit for existing MMPs. While MMPs endeavour to reduce their direct costs, sharing a float will attract an interchange that increases their costs, especially in rural areas;
- Agent interoperability could also encourage consolidation, which poses a systemic risk for financial services as a single point of failure in markets, and will predominantly impact rural areas;
- Agent interoperability increases the risk of fraud and arbitrage as agents serve customers from different MMPs, making the process of monitoring transaction flows costlier and more complex;
- Resulting operational implications from agent interoperability, including the impact on customer services, both that of the agent and a customer's MMP, will increase the cost and complexity of managing erroneous cash-out or cash-in transactions. Establishing the trail of funds across networks becomes more cumbersome and generates a higher burden of administrative tasks;
- Agent interoperability could expose commercially sensitive information to competitors, which could create unfair practises or discourage investment in both MMP and MNO business models.

Across the focus markets in this study, we found the regulatory and commercial landscape for agents enabling and open for fair competition, allowing participation not only of the incumbent, but also new entrants in the market.

23. Jacqueline, J. and Wasuuna, N. (2018), [Distribution 2.0: The future of mobile money agent distribution networks](#). GSMA.

24. Ibid.

3.4 The opportunity for interoperability at the merchant level

A more realistic proposition for MMPs is interoperability at the merchant level. Merchant interoperability allows consumers to transact at any retailer, regardless of the account held by the merchant. Merchant interoperability can drive mobile money use and represents a clear opportunity for MMPs to collaborate on acquiring and enabling payments at points of sale and over a shared merchant network.

In 2018, the GSMA supported the launch of Mowali, a joint venture between Orange Group and MTN Group that aims to enable domestic and international

interoperable payments across a mobile money base of over 100 million users.²⁵ In addition to enabling interoperable P2P transfers across borders, Mowali has standardised a common payment infrastructure to accelerate online and physical merchant payments.²⁶

Assessments of electronic payments, including mobile money, highlight the benefits of standardising and digitising merchant payments for micro, small and medium enterprises (MSMEs), as well as consumers, suppliers and governments.^{27,28} These benefits are summarised in Table 1.

Table 1

The benefits of standardising and digitising merchant payments

Consumers	Merchants	Suppliers	Governments
<ul style="list-style-type: none"> • Simplicity and convenience • Increased digital transaction history for day-to-day retail purchases, which increases access to value-added financial products (savings, credit and insurance) • Direct access to promotions and incentives 	<ul style="list-style-type: none"> • Security and protection against theft and fraud • Enhanced decision making through digital data on-flows, profit and loss • Value-added services, including credit • Direct channel to communicate with and advertise to consumers before and after a purchase 	<ul style="list-style-type: none"> • Reduced operational costs and risks from cash disbursements and collections • Enhanced liquidity and inventory management • Improved infrastructure to organise and boost promotions, loyalty and sales incentives 	<ul style="list-style-type: none"> • More accurate sources to monitor consumer spending and retail transactions • Reduced leakage • Stronger evidence linking electronic payments to economic output and social welfare

25. Orange (2018), "[Orange and MTN launch pan-African mobile money interoperability to scale up mobile financial services across Africa](#)". Press Release.
 26. GSMA (23 November 2018), "[Unlocking mobile money interoperability and merchant payments across Africa through Mowali](#)". GSMA Mobile Money Blog.
 27. World Bank Group and World Economic Forum (2016), [Innovation in electronic payment adoption: The case of small retailers](#).
 28. Deloitte (2014), [Mobile Money: A payment industry revolution impacting marketing and distribution](#).

4.0

The journey to A2A interoperability in six focus markets

This section provides a current account of where the six focus markets in our study are in their respective journeys with A2A interoperability. Here, we offer a comparative assessment while Appendix 4 delves into

country-specific experiences. The section concludes with insights into what is shaping interoperability in these markets, from governance structures and regulations to business models and customer journeys.

4.1 Focus market selection

This study features comparative insights from six of 19 country markets where mobile money A2A interoperability is live: Tanzania, Pakistan, Madagascar, Jordan, Ghana and Uganda.

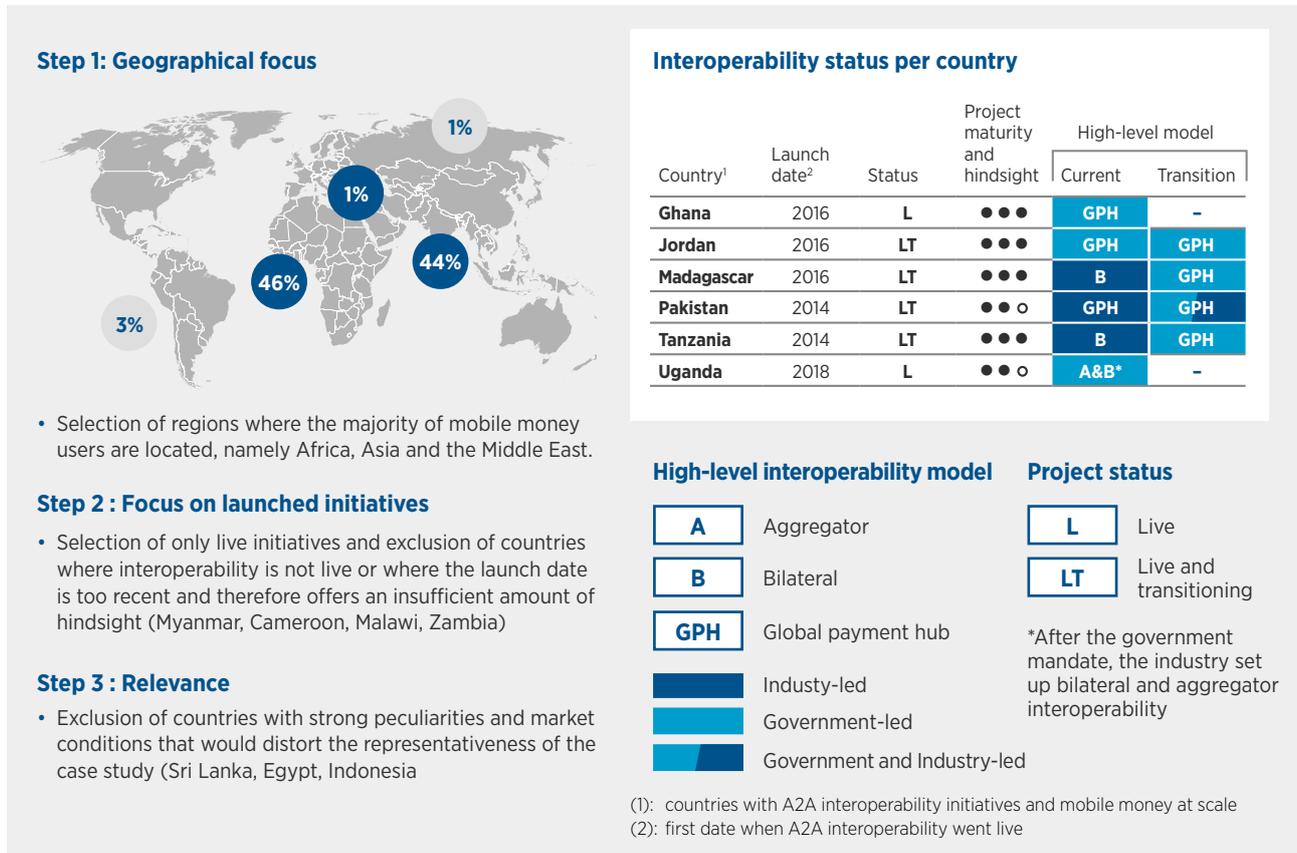
To ensure we conducted a holistic assessment, we selected six focus markets based on a range of factors, including three main characteristics as captured in Figure 5:

- 1) Markets with mobile money penetration, including a diverse mix of regional representation where possible;
- 2) Markets with relatively mature interoperability implementation, including the presence of a live framework and a planned transition to a renewed approach; and
- 3) An interoperability model that is relevant and applicable to other markets.

In markets where mobile money deployments are prevalent and where interoperability is live, our research shows a global shift towards government-led central hubs. While outside the scope of this study, other markets of interest for future research include countries approaching commercial launch, including the Democratic Republic of Congo, Malawi and Morocco. For a longer list of markets with A2A interoperability and with expected transitions, see Appendix 2.

Figure 5

Selection framework for focus markets



4.2 The evolution of interoperability in the focus markets

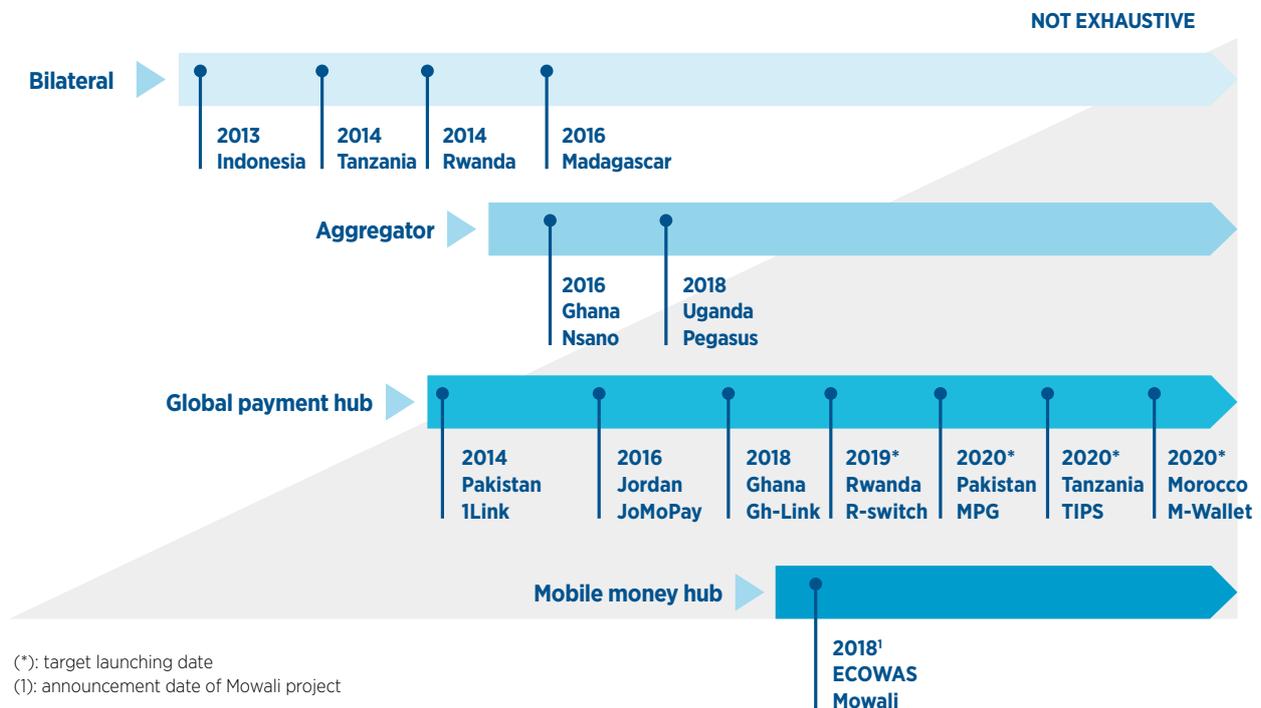
In all six focus markets, the path to A2A interoperability has varied, in some cases significantly. The differences lie in the role MMPs have played in decision making, whether there is specific regulation related to interoperability²⁹

and the type of technical solution adopted. In this section, we provide a high-level overview of interoperability in each of the six markets. For a more detailed summary of country experiences within the six focus markets, please see Appendix 4.

29. For a list of regulations guiding interoperability in the six focus markets explored in this study, see Appendix 5.

Figure 6

Global timeline of interoperability models



In 2012, mobile money providers in Tanzania initiated industry-led discussions on A2A interoperability, which were facilitated by the International Finance Corporation (IFC). In September 2014, bilateral agreements between three MMPs effectively launched A2A interoperability in the absence of formal regulation or a government mandate for interoperability.³⁰

That same year in Pakistan, MMPs became interoperable in a context where MMPs and banks were already interoperable through an interbank switch. Existing integration with banks made it relatively simple to integrate the mobile money platform with the banking platform and facilitate A2A interoperability.³¹

In 2016, Madagascar undertook a similar approach to Tanzania's industry-led model. Through the support of an external facilitator

and, in this instance, the GSMA, providers began discussing how to connect their mobile money platforms. Later that year, MMPs finalised bilateral agreements and connections, allowing customers to send money across three providers under an umbrella of common contracts and operational rules.

In 2013, Jordan's regulatory framework evolved to include MMPs and required both immediate A2A interoperability on day one of a mobile money service, as well as interconnection to a central national platform, JoMoPay. This led existing mobile money providers to adapt and pause their service until they were able to connect in a commercially sustainable way. A2A interoperability between two providers was launched thereafter in 2016 through JoMoPay. Prior to the launch, the GSMA intervened at the request of industry to support a process that simplified technical integration requirements.³²

30. Warioba, M. (2016), [Tanzania mobile financial services interoperability](#). IFC.

31. Bindo, R. and Hasnain, S. (2015), [Choosing a technical model for A2A interoperability: Lessons from Tanzania and Pakistan](#). GSMA.

32. Scharwatt, C. and Nautiyal, A. (2016), [The long road to interoperability in Jordan: Lessons for the wider industry](#). GSMA.



In Ghana, MMPs experienced an initial period of mandated interoperability with banks between 2008 and 2015 under a many-to-many model. Meanwhile, A2A interoperability became possible bilaterally through aggregators in 2016, and updated legislation in 2017 mandated MMPs to interoperate among themselves and banks through a central switch. To do this, the existing interbank hub, Gh-Link, was upgraded in May 2018 to allow MMPs to connect.

In 2017, the Bank of Uganda acted swiftly on regulation announced four years earlier— the 2013 Mobile Money Guidelines—to mandate immediate interoperability between MMPs over a period of a few months. This short timeline led two of the country’s major MMPs to initially use an aggregator before connecting bilaterally in 2019. However, they continue to use third parties for interconnection with smaller MMPs.

4.3 Early insights and trends

A2A interoperability is still relatively new in the markets we studied, with the exception of Tanzania and Pakistan where mobile money interoperability has surpassed the five-year mark. While trends are largely preliminary and may differ in each market, a few common themes and lessons have surfaced.

In the following sections, we focus on lessons learned along five main areas: 1) the uptake of interoperable transactions; 2) governance structure, including the role of MMPs in decision making; 3) existing regulatory frameworks shaping interoperability domestically; 4) the type of technical solution adopted and its corresponding business model; and 5) the customer journey, in terms of pricing and user experience.

Timeline reflecting commercial launch of A2A i/o

Commercial Launch of A2A i/o ¹		Key Mobile Money Providers (MMPs) in market	Mobile money activity: Bank or MNO led	
2018	UGANDA 	<ul style="list-style-type: none"> • UTL • Airtel • MTN • MicroPay 	<ul style="list-style-type: none"> • MobiCash • EezyMoney • Africell 	MNO-led
2016	MADAGASCAR 	<ul style="list-style-type: none"> • Orange • Telma 	<ul style="list-style-type: none"> • Airtel 	MNO-led
	JORDAN 	<ul style="list-style-type: none"> • Orange • Zain • Aya 	<ul style="list-style-type: none"> • Dinarak • Al Hulool 	MNO-led
	GHANA 	<ul style="list-style-type: none"> • AirtelTigo • MTN • Vodafone 	<ul style="list-style-type: none"> • ZeePay Ghana Limited • Société Générale 	Bank led with the many-to many model in early days (2008) then cancellation of the model in 2015 and MNO-led since then
2014	TANZANIA 	<ul style="list-style-type: none"> • Vodacom • Tigo • Airtel 	<ul style="list-style-type: none"> • Halotel • Zantel • TTCL 	MNO-led
	PAKISTAN 	<ul style="list-style-type: none"> • Easy Paisa • Upaisa • JazzCash 	<ul style="list-style-type: none"> • PayMax • HBL Express, Omni 	Bank-led

4.3.1 The uptake of interoperable transactions is increasing

In most markets, in-country research suggests interoperable transactions are replacing off-net vouchers as volumes shrink. However, vouchers are still a viable option for consumers without a mobile money or bank account.

GSMA data also shows healthy growth in interoperable transaction volumes in the six focus markets, although this trend should be interpreted with caution.³³ In some markets, the overall volume of interoperable transactions is still relatively small and growth rates should be considered in perspective. In some instances, interoperable transactions only make up a small proportion of total P2P transfers in a market.

In Ghana, for example, interoperable transactions have almost doubled between September 2018 and June 2019. Despite this remarkable growth, interoperable transactions only represent 2.1 per cent of all P2P transfers in the market. Similarly, in Jordan, interoperable transactions represent 3.4 per cent of total P2P transfers despite an impressive growth rate of 104 per cent during the same period. Likewise in Pakistan, where interoperable transactions have grown 97 per cent, but also represent a relatively small share of total P2P transfers 6.3 per cent. In Tanzania, however, interoperable transfers have grown steadily and represent 32 per cent of all P2P transfers in the market. Uganda was the only market in the study where interoperable transfers have declined, accounting for 0.4 per cent of P2P transactions. While a range of factors can be attributed to this trend in Uganda, the most significant is higher taxation levied on mobile money transactions.³⁴

	Regulatory status towards mobile money interoperability	Current mobile money interoperability technical model(s)
	Mandated	Aggregator and Bilateral
	Not mandated	Bilateral
	Mandated	Global payment hub
	Mandated	Global payment hub
	Not mandated	Bilateral
	Not mandated	Global payment hub



33. The data over four quarters (September 2018 to June 2019) is based on information collected through the GSMA's 2019 Global Adoption Survey of 104 MMPs. This period was chosen based on the timelines interoperability was implemented in each country and to allow for some comparative assessment.

34. In May 2018, the Government of Uganda introduced legislation that placed a one per cent tax levy on all mobile money transactions, including cash-in, transfer and cash-out. The tax was unique in that there was no precedent globally for a transaction tax on the transfer or payment of money between people. It was also controversial and public outcry saw the tax law being amended in November 2018 to apply a 0.5 per cent tax on withdrawals only.

4.3.2 A comprehensive and effective interoperable solution includes all stakeholders in governance

When it comes to the design of interoperable solutions, MMPs have had mixed representation. In industry-led models, MMPs have participated

fully, while in alternative models involvement has been limited.³⁵ Participation and contribution have a strong influence on commercial incentives to connect to solutions, particularly when MMPs are excluded from meaningful deliberations on business rules.

Table 2

Decision-making structure and representation of MMPs in the six focus markets

	Ghana	Jordan	Madagascar	Pakistan	Tanzania	Uganda
Decision-making structure	Central banks + one banking sector representative	JoPACC: 55 per cent Central Bank of Jordan; 45 per cent 25 commercial banks	N/A – informal industry forum	11 owner banks	N/A – informal industry forum	N/A – bilateral discussions
Representation of MMPs' interests*	Low	Low	High	Medium	High	High

(*) Representation of MMPs' interests are based on whether they **belong to the board of a hub with non-MMP participants**. In bilateral arrangements, it is assumed that MMPs have high representation as they operate and lead the rules and decisions applied to their solution. In Ghana and Jordan, MMPs are not included on the boards governing interoperability although they are consulted. In Pakistan, MMPs are represented indirectly.

The participation level of MMPs has influenced their respective involvement in decision making. In countries with bilateral agreements, MMPs have had full decision-making control over their interoperability solution until launch. However, it is expected that three countries (Madagascar, Tanzania and Uganda) will soon transition to a national hub, raising doubts about MMPs' decision-making power going forward. In Jordan, several stakeholders have indicated that MMPs will at some point acquire the Central Bank of Jordan's shares in JoPACC.

The active participation of MMPs is necessary throughout the lifecycle of an interoperability journey, from design and launch to implementation and setting commercial and operational rules. This is particularly important in markets where mobile money account ownership is the primary or equivalent pathway to financial inclusion. As shown in Table 3, three out of six focus markets have a higher or similar ratio of mobile money account ownership to bank account ownership. This includes Uganda, Tanzania and Ghana.

35. For a study of the four types of interoperability models—bilateral, aggregator, global payment hub and mobile money hub—see a companion GSMA report, *The Many Paths to Mobile Money Interoperability: Selecting the Right Technical Model for Your Market*.

Table 3

Mobile money and bank account ownership across focus markets

 Country	 Population (millions) ¹	 Account (% age 15+) ²	 Financial institution (bank) account (% age 15+) ²	 Mobile money account (% age 15+) ²
Tanzania	58	47%	21%	39%
Pakistan	216	21%	18%	7%
Madagascar	26.9	29%	28%	1%
Jordan	10.1	42%	42%	1%
Ghana	30.4	58%	42%	39%
Uganda	44.2	59%	33%	51%

(1): UN World Population Prospects (2019), Data Booklet; (2): World Bank (2017), Global Findex

From a governance perspective, the industry-led bilateral agreements seen in Tanzania and Madagascar demonstrate how early buy-in to interoperability can smooth decision making on pricing and operational rules before commercial launch. Meanwhile, centralised hub models (where hub ownership lies outside the mobile industry) highlight the potential for limited MMP engagement. In Ghana, Gh-Link is a subsidiary of the central bank, which includes representation from a national banking association but no formal participation from MNOs. Similarly, in Pakistan, 1Link is owned by a consortium of banks. Given their role in the payments landscape, governance models should provide equal voice and voting rights to MMPs.

While an interoperable ecosystem is developing, MNO interests should be represented as a coordinated industry position, ideally by an association with a deep understanding of the mobile money business model. In the absence of a country-specific industry association in the telecom sector, as commonly seen in the banking space, MMPs can continue to turn to independent third-party facilitators for specialised expertise

and consensus building. This has been seen with stakeholders such as the GSMA (Madagascar, Tanzania, Jordan and with Mowali), IFC (Tanzania), CGAP (Jordan) and Financial Sector Deepening (Uganda).

4.3.3 Regulation should promote enabling conditions for commercial viability

When interoperability is mandated by the government, participants usually sign a common agreement overseen by a central institution managed by the regulator. In an industry-led model, bilateral agreements can coexist with differences in scope, for example, with common operational rules (business model, dispute resolution agreement, service level agreements) but bilaterally negotiated pricing, as seen in Tanzania.

As mobile money becomes more prominent in emerging markets, regulation continues to respond with guidelines on the scope and role of MMPs in a payment ecosystem. In the realm of mobile money interoperability, the ideal

environment is one in which industry leads a collaborative design and implementation of operational rules. This ensures long-term commercial viability and, in turn, provides a clear framework for how financial inclusion can be achieved.

In contexts where central banks mandate interoperability among MMPs and between MMPs and banks, regulation should promote interoperability without explicitly defining the terms of the technical approach or solution. This provides industry some room to determine the best commercial path in terms of which technical route to adopt and which pricing model to pursue.

Regulation should therefore provide reasonable time for MMPs to respond and adapt. Mandating interoperability immediately, or within a short time

frame, removes opportunities for a thoughtful and holistic analysis of commercial sustainability. Requiring immediate interoperability can also delay or hamper the uptake of interoperable transactions, and mobile money services altogether. This is a particular risk in contexts where regulators impose immediate connections to a centralised hub. MMPs should instead be encouraged to connect when their service is ready.

Ultimately, the way in which regulations are announced and implemented will hinge on the uptake of mobile money services and interoperable transactions. To ensure commercial viability, it is important to regularly consult with industry, both before and during the development of interoperability regulation.

Table 4

Regulatory aspects of interoperability

	Ghana	Jordan	Madagascar	Pakistan	Tanzania	Uganda
Interoperability and regulatory framework	Interoperability and regulatory framework Not mandated by regulation, but mandated by Bank of Ghana	Mandated	Not mandated	Not mandated	Industry initiative: not mandated by the regulator at inception	Mandated
Level of regulatory influence on technical solution	Interoperability solution developed and managed by GhIPSS	Interoperability solution developed and managed by Central Bank of Jordan	MMPs decide	MMPs decide	Industry initiative: no constraint, but report to Bank of Tanzania	MMPs decide
Scheme rules; contracts	GhIPSS scheme rules; SLAs under discussion	Common operational rules signed bilaterally with CBJ and JoPACC; business rules under discussion	Common contract signed bilaterally	1Link scheme rules signed by participants	Common operational rules and bilateral contracts (for fees)	Bilateral contracts (with aggregator or other MMPs)

4.3.4 Determining pricing and business models early ensures long-term sustainability

To achieve and maintain a commercially sustainable business model for A2A interoperability, MMPs often resort to an interchange model in which a receiving provider compensates the sending MNO for liquidities leaving its ecosystem. This approach, commonly referred to as a “receiver pays” model, ensures that the sending MMP is compensated for

what would have been a cash-out transaction fee from an on-net use case. Higher customer surcharges for cross-net P2P transfers are often absorbed by a sending end user. This excludes markets where there is not a higher surcharge for consumers (Tanzania, Jordan) or in rare instances where both sending and receiving end users take on the higher charge (Madagascar). Finally, interoperability hub models can reduce the profit margin of interoperable transactions due to the imposition of a processing fee (Ghana, Pakistan).³⁶

Table 5

Interoperability business models and pricing arrangements

 Country and interoperability model	 Processing fees and surcharges	 Interchange approach between MMPs
Tanzania <i>Bilateral</i>	No processing fee No surcharge	Receiver MMP pays
Pakistan <i>Private hub</i>	Processing fee Surcharge applies	Receiver MMP pays
Madagascar <i>Bilateral</i>	No Processing fee Surcharge applies	No interchange fee
Jordan <i>National hub</i>	No processing fee No surcharge (Both under discussion as of January 2020)	No interchange fee (Under discussion as of January 2020)
Ghana <i>National hub</i>	Processing fee Surcharge applies	Receiver MMP pays
Uganda <i>Bilateral</i>	No processing fee Surcharge applies	Receiver MMP pays

36. For an in-depth analysis of the profitability and commercial elements of different interoperable models, see a companion GSMA report, *The Many Paths to Mobile Money Interoperability: Selecting the Right Technical Model for Your Market*.



MMPs can accelerate financial inclusion by unlocking access to mobile financial services for previously unbanked population segments. However, mobile money services are predicated on a low-value/high-volume business model that relies on thin margins and is susceptible to added costs. Depending on key factors like imposed regulation, introducing interoperability can have serious financial consequences for both MMPs and end users, and ultimately reduce uptake of cross-net transactions and jeopardise the viability of the mobile money business model.

To enable informed decision making and deliberations, it is essential that key business terms are ironed out prior to the commercial launch of interoperability. Establishing clear parameters for interchange agreements and processing fees will help determine whether an interoperable solution will be commercially viable. When these details are tackled too late in the process or post-launch, there is a risk that interoperability can functionally exist in a market but fail to take off. In Pakistan, for example, MMPs stressed that switch fees applied by 1Link have translated into higher surcharges for consumers sending cross-net transfers, making these low-value transactions too expensive.

4.3.5 Attractive consumer pricing and user-friendly customer journeys can increase uptake of interoperable transactions

In some markets, interoperable transactions are priced at a higher consumer surcharge than use cases within the same network. In markets like Tanzania where there is no discriminatory pricing, evidence shows a higher uptake of interoperable transactions in both values and volumes. A higher client surcharge relative to on-net transactions can therefore reduce uptake of A2A interoperability and force consumers to revert to using cash or multiple SIMs.

In addition to pricing, simplifying the user experience will raise consumer awareness of interoperable transfers and stimulate usage. Reducing the steps involved in the customer journey—the process required to perform an interoperable transfer from start to finish—will help to scale the use case.

Facilitating mass market adoption of A2A interoperability requires clear and straightforward processes from a user perspective. When performing an interoperable transaction, the customer journey should mirror an on-net transaction as much as possible.

05 Conclusion

The implementation of mobile money A2A interoperability in the six markets in our study is still fairly new. Nevertheless, five important lessons can be gleaned from their experiences and can serve as best practices for the design and adoption of future interoperability models. Lessons to date show that even with a technical framework for interoperability in place, uptake will be driven by a host of factors related to governance structures, regulation, commercial decisions and user experience.

This study reinforces the need for more evidence on the effects of interoperability. As mobile money interoperability frameworks mature in more

markets and as more countries adopt a solution, measuring success will depend on the availability of data leading up to, and following, commercial launch.

Understanding how an interoperable market can enhance domestic payment landscapes and contribute to broader socioeconomic objectives for financial inclusion and cashless economies will be essential to strengthening the business case for integrations between MMPs, banks and other financial system players. Once in place, assessing the impact of interoperability—domestically, regionally and internationally—will require a concerted effort to measure and track progress.



Appendix 1: P2P payment alternatives to real-time interoperable transfers

Modality	Definition and trade-offs
Over-the-counter (OTC) transaction	<p>A process by which a mobile money agent performs a transaction on behalf of a customer paying them in cash. This is often because a sending customer is not registered to an MMP³⁷ or has had perceived or actual technical difficulties adopting a mobile money service.³⁸</p> <p>While OTC transactions can introduce and catalyse the adoption of mobile money accounts for new customers, they require travelling to an agent and can involve a cash-in transaction fee (depending on the MMP), imposing financial and time constraints on consumers.</p> <p>OTC often promotes continued use and reliance on cash. In the absence of strong KYC requirements, OTC transfers can be associated with risks related to fraud and anti-money laundering (AML).³⁹</p>
Voucher	<p>Vouchers are a mechanism through which a text message and code are sent to a receiver who then withdraws cash at an agent in the sender's MMP network, using various identification mechanisms to perform the cash-out.⁴⁰ Cash-out is the only transaction available through a voucher and imposes a cash-out fee that is usually higher than an on-net transaction.</p> <p>In the initial stages of mobile money, vouchers were promoted by MMPs to encourage interaction with agents and enrol new customers to a mobile money wallet.⁴¹ Vouchers are still an option for sending money to end users who do not have a registered mobile money account, but they can also be sent to account holders in the same or different MMP network.</p> <p>In addition to the physical requirement to travel to an agent and the limited choice offered (i.e. cash-out only), another challenge with vouchers is the time limit for using them. Many consumers are not aware of this time limit, which leads to vouchers expiring and reversing after a certain number of days. A core distinction between vouchers and A2A interoperability is that the latter offers a real-time access of funds into a mobile wallet.</p>
Multi-SIM	<p>A practice that involves alternating between SIMs of different networks, often powered by devices able to host more than one SIM card.</p> <p>Multi-SIM is an alternative to sending transactions across networks (i.e. cross-net) since instead of sending money from one network to another, a sender chooses to acquire a second SIM card from the receiver network to ultimately conduct a transaction on the same network (i.e. on-net).</p> <p>In contexts with discriminatory pricing, where cross-net fees are higher than on-net fees, a consumer may choose to limit and manage costs by incurring the inconvenience of owning more than one SIM card.</p>
Cash	<p>Carrying and exchanging cash is the most traditional form of peer-to-peer transfer. Individuals can deliver cash in person or through an intermediary, such as a relative or bus driver, who can then facilitate the transfer of funds on their behalf. In the case of cross-border remittances, regional transport providers often play an informal role in delivering cash-based P2P transfers amongst family members.</p> <p>Although sometimes intended to serve a social purpose such as a community gathering, delivering cash can impose a security risk (theft) and time constraints (travelling to the receiving individual or intermediary). With intermediaries, there is also a lag between when the cash is delivered and when the recipient receives the funds.</p>

37. GSMA (26 April 2018), "[Moving beyond over-the-counter transactions](#)". GSMA Mobile Money Blog.

38. Orakzai, M. (31 March 2016), "[Mobile money: OTC and the agent dilemma](#)". Karandaaz Blog.

39. Microsave Consulting (2014), [The OTC trap – Impact on the business case for Uganda's mobile network operators](#).

40. Murphy, A. (2014), [Beyond vouchers: Meeting growing demand for off-net P2P transfers](#). GSMA.

41. Ibid.



Appendix 2: Actual and intended approaches to A2A interoperability in selected markets and beyond



Project type

- Interoperability between MMPs mandated or strongly recommended by the regulator
- Interoperability between MMPs not mandated
- Mobile money providers only
- Mobile money providers and banks
- Interoperability under construction
- Transition towards a government-led model

(1): countries where documentary research revealed A2A interoperability Initiatives

(2): Sri Lanka opted for a wholesale model where one MMP shares its MMP platform with another, rendering them interoperable by default.

(3): in the new model initiated by the regulator, solution's ownership has been transferred to the private sector. The previous model has been discontinued.

(4): MMPs were mandated to connect to the National Central Switch but A2A interoperability is yet to be achieved due to the lack of commercial agreements between players.

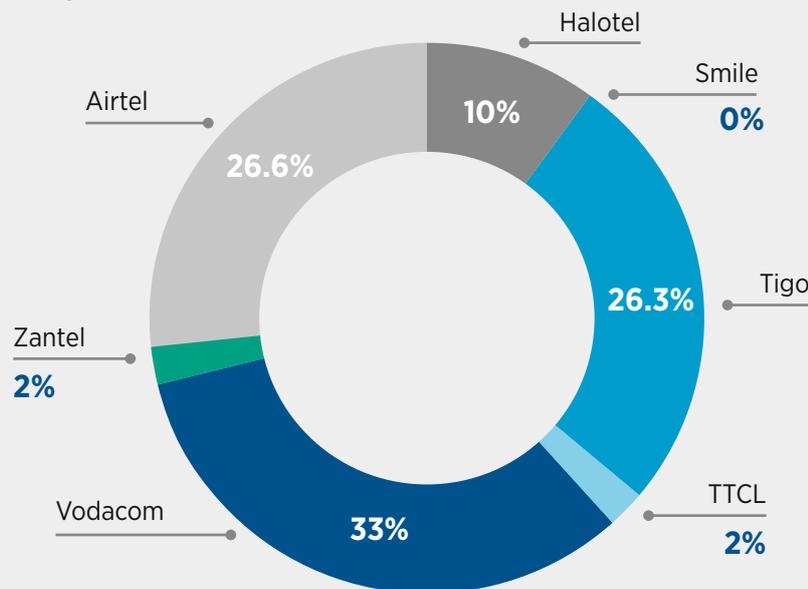
(*): to be confirmed

Appendix 3: Mobile money market share in Tanzania and Pakistan

Market share of mobile money services in Tanzania (December 2019)

Operator	OCTOBER	NOVEMBER	DECEMBER
Airtel	12,143,922	12,428,969	12,722,224
Halotel	4,239,693	4,142,712	4,641,701
Smile	1,624	1,184	1,222
Tigo	12,230,772	12,428,601	12,572,826
TTCL	890,428	937,948	981,072
Vodacom	14,979,714	15,357,823	15,672,390
Zantel	1,173,130	1,153,669	1,170,085
TOTAL	45,659,283	46,450,906	47,761,520

Operators' subscription market shares



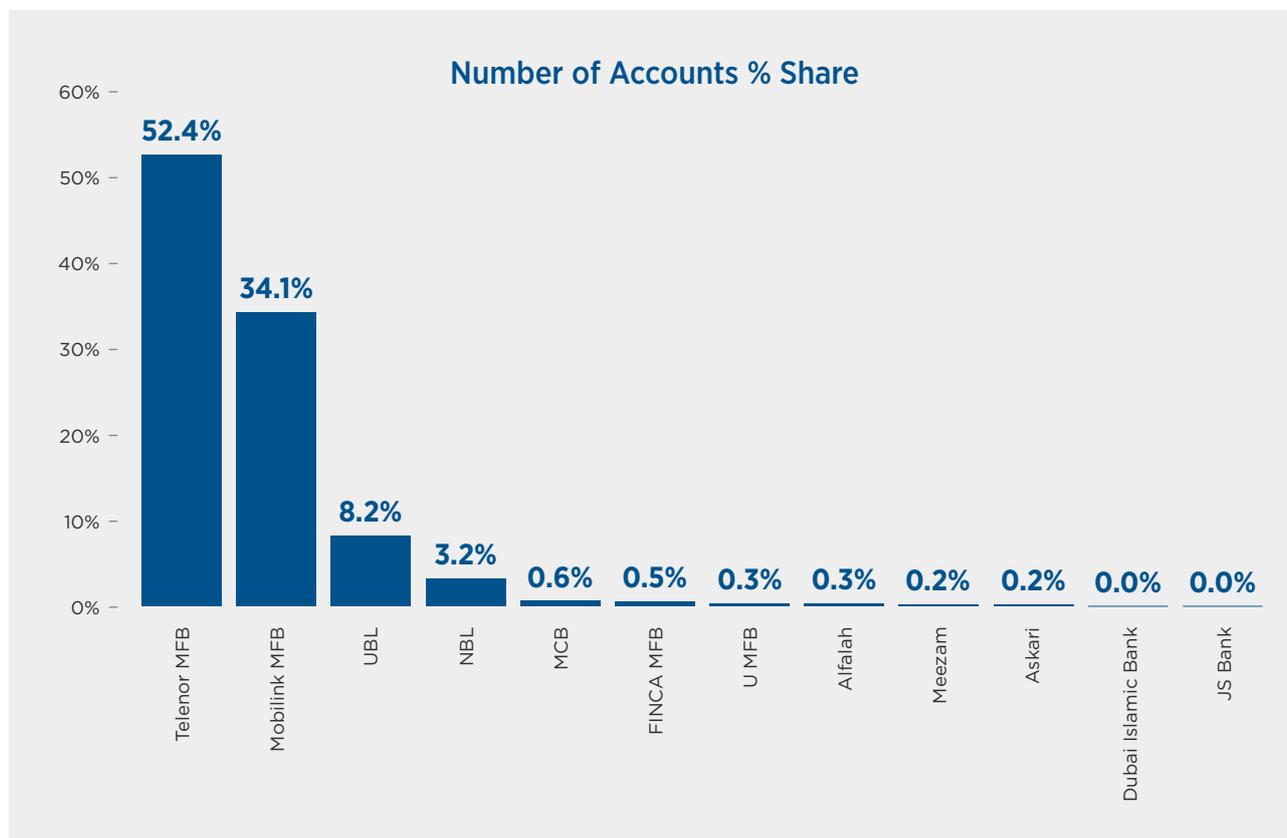
Subscriptions to Mobile and Fixed Network

Operator	OCTOBER	NOVEMBER	DECEMBER
Mobile Network	45,582,235	46,574,209	47,685,232
TTCL	77,048	76,697	76,288
ZANTEL	0	0	0
Fixed Network	77,048	76,697	76,288
TOTAL	45,659,283	46,450,906	47,761,520

Source: Tanzania Communication Regulatory Authority (December 2019), [Quarterly Communications Statistics](#).



Market share of mobile money services in Pakistan (October to December 2018)



Source: State Bank of Pakistan (October–December 2018), [Quarterly Newsletter: Branchless Banking](#), Issue 30.



Appendix 4: Country Case Studies

Tanzania

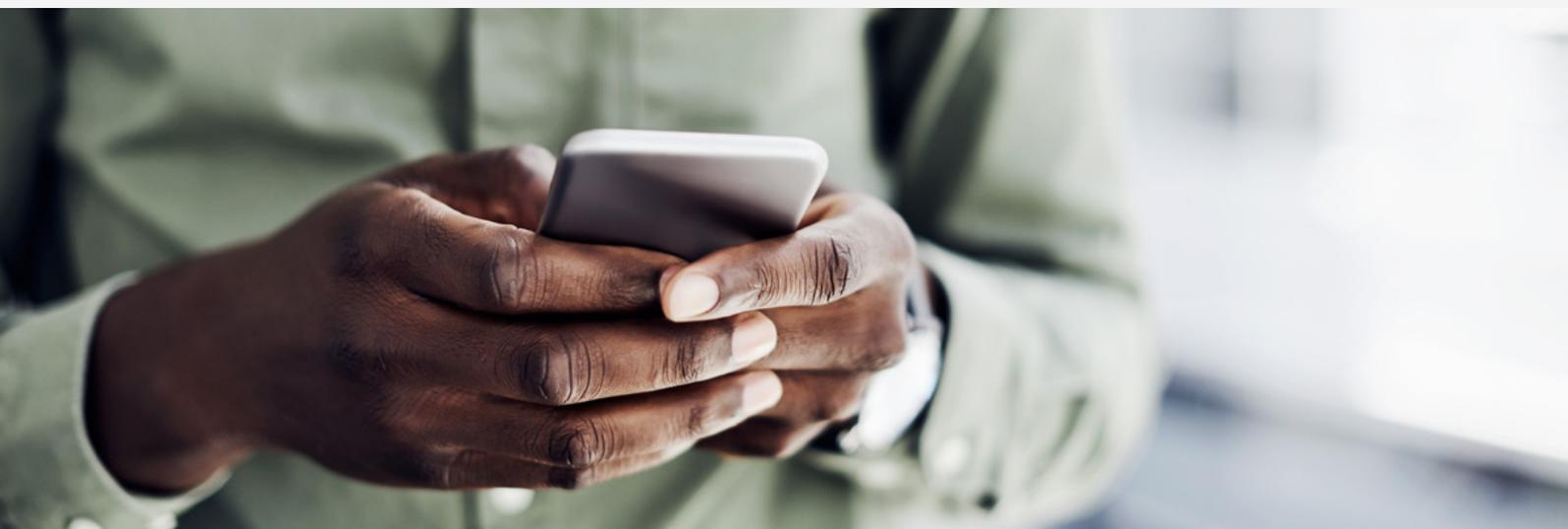
In Tanzania, discussions about A2A interoperability began in 2012, with three key stakeholders playing a vital facilitation role: the IFC, Bill & Melinda Gates Foundation and Financial Sector Deepening (FSD) Tanzania. Implementation commenced following approval from the Bank of Tanzania in 2013 and A2A interoperability launched commercially in 2014. This marked the first interoperable mobile money service between MMPs, with Tigo, Airtel and Zantel enabling bilateral connections for cross-net P2P transactions. Vodacom was the last to join the agreement and connected to each MMP bilaterally.⁴²

Tanzania adopted an interesting combination of general rules that applied to all MMPs, as well as bilateral agreements for specifics such as pricing. The rule is that the receiver MMP pays interparty fees to the sender MMP under a net receiver pays model. This is completely transparent for the final end user as no surcharge is applied on cross-net transactions. As in other bilateral models, the typical settlement is handled through prefunded accounts held by each MMP. A bank transfer is manually generated to settle the net position of the sender.

One year after industry implemented A2A interoperability, the 2015 National Payment Systems Act was introduced. The legislation delegated the Bank of Tanzania as the overseer of mobile money activities while also mandating non-discriminatory pricing for cross-net and on-net P2P transactions.

Tanzania continues to experience a high degree of success with A2A interoperability, demonstrated primarily by a continued increase in cross-net transactions. In 2017, cross-net P2P transactions represented 30 per cent of overall P2P transactions and is still on a growth trend six years later.⁴³

New regulations requiring interoperability between MMPs and broader financial institutions, including banks, are set to transition providers to connecting centrally to the country's national payment switch. The Tanzania Instant Payment System (TIPS) platform has been in development since January 2019 and is expected to launch in 2020.⁴⁴ The new applicable standards are still to be determined, and consultations are ongoing with MMPs and banks. The added value for MMPs is still unclear as the hub model is likely to levy processing fees and introduce additional costs.



42. Warioba, M. (2016), [Tanzania mobile financial services interoperability](#). IFC.

43. Cook, W. (2018), [Interoperability in East Africa: Dispatches from the home of mobile money](#). CGAP.

44. Bank of Tanzania (2019), [Monetary Policy Statement](#).

Salient success factors	Outcomes
Having an external facilitator	Helped engage MNOs in the project, which reduced time to market.
Relatively balanced market shares	Enabled greater collaboration between all MMPs and reduced the fear of disproportionate e-money outflows.
Cross-net pricing aligned with on-net fees	Eased service adoption and uptake of cross-net transactions.
Multilateral agreements and bilateral contracts clearly defined and set prior to commercial launch	Removed uncertainty about the business model and viability of the project.
Ease of customer experience	Built trust among users, which fostered service adoption and uptake of cross-net transactions.
Awareness campaigns	Fostered service adoption and uptake of cross-net transactions.
Market Need	The competitive landscape called for reliability in interoperable P2P transfers as opposed to the voucher system where the customer needed is required to get a code to cash-out value at an agent within seven days, otherwise the funds would be rolled back.
In the absence of specific interoperability regulation, Bank of Tanzania adopted an overseeing position while allowing MMPs to pursue a “test and learn” approach.	Less regulatory uncertainty
Main challenges	Outcomes
No clarity at this stage on the upcoming Tanzania Instant Payment System (TIPS) business rules.	Greater uncertainty about the viability of interoperability and cross-net transactions in the future.
The obligation to shift cross-net A2A transactions to TIPS will introduce a processing cost.	Greater uncertainty about the viability of cross-net transactions for MMPs.



Pakistan

In Pakistan, mobile money is known as “branchless banking” and follows a bank-led model. In this context, financial accounts are held at banks, and to deploy a mobile money service MNOs have either established partnerships with banks or taken ownership of one. The first mobile money service in Pakistan, Easypaisa, was launched in 2009 by Telenor and Tameer Bank (now Telenor Bank), and was later followed by UBL Omni (2010), HBL Express (2012), JazzCash (2012), Upaisa (2013) and, more recently, PayMax (2018).

In Pakistan, interoperability between banks and MMPs is provided by 1Link.⁴⁵ 1Link is a company owned by 11 member banks, providing them with ATM and interbank switching services.⁴⁶ When interoperability was first launched, most banks were already connected to 1Link and familiar with its system.⁴⁷ Moreover, given the bank-led model, MMPs were already connected to 1Link by default, which made integration between their mobile money and banking platforms relatively simple.⁴⁸

A2A interoperability was launched in March 2014 with HBL and Omni, both of which were already connected to 1Link. They were quickly followed later that same year by Easypaisa, Upaisa and Jazz. Although it was not available at first, MMPs insisted that 1Link implement a receiver pays model. The processing fee of 1Link was also reduced to better suit the mobile money business model.⁴⁹

In 2019, the State Bank of Pakistan introduced a circular on Regulations for Electronic Money Institutions (EMIs). The circular removes the requirement for mobile wallet services to be affiliated with a bank and expands the scope for private actors to engage in multilateral routing, switching and/or

processing payment transactions. This promotes the possibility for alternative private switches in addition to 1Link, and prospective actors are encouraged to be interoperable from inception.⁵⁰

Simultaneously in 2019, the State Bank of Pakistan, together with Karandaaz, has also been working on a Micro Payment Gateway (MPG) based on the Bill and Melinda Gates Foundation’s Level 1 project.⁵¹ Due to relatively high fees imposed by 1Link’s Interbank Fund Transfer System (IBFT), small-value transactions were deemed too expensive, limiting overall uptake of P2P transactions. The MPG, set to launch in 2020, is intended to drive down the cost of interoperable P2P transactions to make them more affordable and increase uptake.⁵²

Although intended to achieve an objective that serves lower-value transactions, the MPG approach raises concerns from private switches, particularly those who entered the market only recently following the circular in 2019 and, in doing so, made significant investments to acquire EMI licenses. Private switches share the concern that the MPG, being a government-led subsidised initiative, will now compete with their business models and render their services less viable.

45. Riley, T.A. and Kulathunga, A. (2017), [Bringing e-money to the poor](#). World Bank.

46. 1Link: <https://1link.net.pk/>

47. Better Than Cash Alliance (2017), “[Establish interoperability in the market](#)”, Accelerators Toolkit.

48. Bindo, R. and Hasnain, S. (2015), [Choosing a technical model for A2A interoperability: Lessons from Tanzania and Pakistan](#). GSMA.

49. Ibid.

50. KPMG. (2019). [A brief on Regulations for Electronic Money Institutions \(EMIs\)](#).

51. Karandaaz (2019), [Policy and regulatory bottlenecks for digital financial services in Pakistan: Findings from stakeholder consultations](#). Policy Brief.

52. Ibid.

Salient success factors	Impact
1Link agreed to review its business model, historically tailored to banks, to better suit MMPs' needs, creating a model with reduced fees and a receiver pays function.	Allowed MMPs to build a sustainable business case for cross-net transactions
Although interoperability was not mandated by the regulator, 1Link sought approval from the State Bank of Pakistan for the services it developed for MMPs.	Ensured government buy-in and removed uncertainty about regulatory aspects.
Banks were already familiar with the 1Link ecosystem.	Reduced integration time
Interoperability is not mandatory.	MMPs can connect to 1Link when they are ready, allowing them to make a business case for interoperability.
Main challenges	Outcomes
1link is a private entity owned by 11 banks.	Not all banks or MMPs are able to acquire ownership and participate in governance. This results in low decision-making power for MMPs. In addition, although banks are mobile money stakeholders, there is no formal way to guarantee that decisions balance the objectives of MMPs and banks.
The cost of interoperable transfers remains high due to the fees charged by 1Link.	The profitability of low-value cross-net transactions are put at risk, affecting the overall uptake of P2P transactions.



Madagascar

In 2016, Madagascar was one of the first countries with live interoperability between all mobile money players in a market.⁵³ While some bilateral agreements between banks and MMPs predated this milestone, the country lacked full A2A interoperability.

In 2014, due to collective interest from industry to reduce cash in the economy, MMPs engaged the GSMA to advance sector-wide discussions on A2A interoperability. The GSMA provided MMPs with templates of contracts, including business rules and service-level agreements. Orange and Telma were the first providers rendered interoperable, rapidly followed by Airtel. The integration processes took approximately nine months.

Following comprehensive joint discussions, MNOs chose to interconnect bilaterally, opting for a prefunded mechanism. In the model created in Madagascar, MMPs have a dedicated account open on their counterparts' platforms⁵⁴ that is credited to mirror bank transfers from one MMP to another and debited in favour of end user receivers.

A unique contract was also signed bilaterally between all parties and stipulated the business

model and operating rules of the interoperability solution. While MMPs clearly chose a model with no interchange, the topic of “client surcharge” was left to the discretion of participants. This has led to mixed pricing models with differing values for cross-net transactions. While some MMPs surcharge cross-net senders, others surcharge cross-net receivers.

Since the launch of interoperability, cross-net transactions have demonstrated steady growth and a share of off-net, voucher-like transactions have been replaced by interoperable cross-net transfers. The solution designed between MMPs has proved to be robust and reliable, as no major change has been required since interoperability was implemented.

Since 2017, there have been ongoing discussions on a national switch to which a wide variety of players would connect, including MMPs and banks. Despite involving representatives of all sectors, some important players on the MNO and banking side have decided to stay out of this project. A request for an expression of interest (EOI) was issued to technical providers, but no outcome has been announced since the applications were received.



53. GSMA (2016), “[GSMA announces launch of national interoperable mobile money service across Madagascar](#)”. Press Release.

54. Cenfri (2017), [Financial Inclusion Diagnostic Report](#).

Salient success factors	Outcomes
Having the GSMA as a project facilitator advocating for the project and providing guidance along the way.	Helped build advocacy and engage the three MNOs in the project. This shortened time to market.
The GSMA provided contract models.	Provided a framework for discussion of business rules among MNOs and shortened time to market.
Staged approaches where business rules were clearly defined prior to launch.	Removed uncertainty about the business model and viability of the project.
Integration processes were conducted in parallel.	The overall connection process was reduced and shortened time to market.
Dedicated teams were assigned to the interoperability project.	Provided increased availability and support during the integration process, reducing overall integration time and time to market.
Separation of the mobile money platforms' core systems from the interoperability module.	Allowed for easier trouble-shooting and upgrading of the platform. Reduced the number of technical failures as well as the time to address them.
Main challenges	Outcomes
No control over each MMP's implementation.	An MMP routed interoperable transactions to OTC cash-out (voucher) instead of MMA-to-MMA.
UX was not always clear.	Resulted in some client confusion between cross-net and off-net transactions.
Surcharge was left to the discretion of MMPs.	Heterogeneous pricing, with some MMPs surcharging cross-net senders while others surcharged cross-net receivers, both of which may have discouraged uptake.



Jordan

In Jordan, mobile money was first enabled in 2010 under the country's Circular for Mobile Payments. Thereafter, Zain and Orange launched a mobile money service in 2010 and 2012 respectively, although both operators experienced limited success. While Zain reached 30,000 registered users and Orange 120,000, this collectively represented just two per cent of Jordan's population of 8 million. Low uptake was largely attributed to narrow parameters for non-banks, which limited their licensing and distribution capabilities.

In 2013, new legislative instructions and guidelines provided Payment Service Provider (PSP) status to non-banks, enabling them to use agent networks and mandating interoperability between MMPs through a new central payment switch, JoMoPay. JoMoPay sought to facilitate interoperability between mobile money providers, as well as between providers, banks and prepaid cards.⁵⁵

While a positive step in some respects, the new legislation obliged providers to pause and re-launch their service given the functional requirement to accommodate A2A interoperability from commercial launch. Due to initial concerns about the viability of the business model, Orange Money halted interoperability completely, relaunching only recently in 2019.⁵⁶ Meanwhile, Zain revamped its business and operational model, ultimately rebranding its product from E-mal to Zain Cash.

By mid-2014, the development of JoMoPay was completed by Progressoft. Using a model that could be described as "build-transfer-maintain", Progressoft assumed the capital expenditures, but retained the maintenance contract for the platform. Initially, MMP integration with JoMoPay was deemed too complex. Providers subsequently sought the support of the GSMA in a proactive attempt to improve their capacity to interoperate with the central connection. Through coordinated discussions, the Central Bank of Jordan agreed to simplify the technical requirements, which it shared with MMPs in 2015. In 2016, JoMoPay was commercially launched with two MMPs connected to it: Zain, an incumbent, and Hulool, a

consortium including operator Umniah. Soon after, JoMoPay was also connected to Aya and Dinarak.

Despite connections to JoMoPay and the feasibility of peer-to-peer transfers across networks, A2A transactions remain low, presumably due to an inability for mobile money services to mature before interoperating. Today, mobile money use cases in Jordan largely serve to facilitate electronic bill payments through the country's national eFawateer system.

In terms of decision making, the participation of mobile money providers is mixed and there is room for improvement. In the early years of JoMoPay, the Central Bank agreed not to apply interchange or processing fees until mobile money reached scale. However, as fees became an increasingly pressing issue, MMPs engaged in discussions about business rules with the Central Bank in 2018 with the coordinated support and involvement of CGAP and GIZ. While consensus has been reached on a receiver pays interchange model, it has yet to be signed. Decisions on surcharge and processing fees are pending.

As of 2020, interoperability in Jordan is undergoing several changes to its technical and governance arrangements. At the recommendation of the World Bank, JoMoPay is migrating from the Central Bank to the Jordan Payments and Clearing Company (JoPAAC), created in 2017. This is largely an effort to separate operations functions from the Central Bank's oversight roles. JoPAAC is owned by 25 commercial banks in Jordan that jointly possess 45 per cent of its shares, while the Central Bank owns the remaining 55 per cent. In this context, mobile operators fall outside formal decision making, but sector consultations occur.

Additional changes include the transition from physical servers to a cloud-based infrastructure aimed at improving resilience and scalability, and the Central Bank recently announced plans for an Instant Payment System that will revamp interoperability based on more recent standards.

55. Yaa Boakye-Adjei, N. et al. (2017), [Paving the way for digital financial services in Jordan. Market and regulatory assessment of payments and remittances](#). DMA Global, CGAP and GIZ.

56. Orange (2019), [Orange Jordan launches "Orange Money" e-wallet service](#). Press Release.

Salient success factors	Outcomes
Clear and early regulation defining interoperability.	Provided a clear framework for MMPs, removing regulatory uncertainty and favouring long-term projections.
Development of JoMoPay followed a “build-transfer-maintain” model with the technical provider, Progressoft, assuming the capital expenditures while retaining maintenance of the platform.	Reduced the initial capital expenditure required, reducing uncertainty on the payback period.
Main challenges	Outcomes
Following new guidelines, A2A interoperability was mandated from day one. MMPs were to launch mobile money services with the interoperability feature from the very first day of commercial launch.	It added complexity to the implementation on the MMP side, delaying the launch of mobile money operations and the uptake of both on-net and cross-net transactions.
Integration requirements to JoMoPay were complex.	It delayed the interconnection process and, therefore, the commercial launch, requiring the GSMA to advocate a way forward between industry and the Central Bank.
No agreements on the JoMoPay business model.	It added uncertainty to the viability of the business model. MMPs were to design a value proposition and connect their services to a central hub without knowing the types of fees they would be charged and allowed to charge.
MMPs do not have ownership in JoPAAC.	MMPs currently have little decision making power over the interoperability solution. Although they are expected to acquire ownership at some point, there is currently no guarantee of balanced decision making.
Initial set-up of a platform on physical servers.	Migration to a cloud solution was needed to improve scalability and resilience, resulting in additional costs.
Frequent regulatory evolutions.	Uncertainty on MMP obligations.



Ghana

Ghana's journey to payments interoperability began in 2007 with the incorporation of its Interbank Payment and Settlement Systems (GhIPSS). GhIPSS, a subsidiary of the Bank of Ghana, is responsible for the management of interoperable payment system infrastructures for banks and non-bank financial institutions.⁵⁷

In 2017, GhIPSS introduced mobile money system interoperability, requiring MNOs to interoperate. Between 2008 and 2015, individual MNOs were required to be interoperable with banks without a formal expectation of mobile money interoperability among themselves. Ghana's 2008 Branchless Banking Guidelines mandated a "many-to-many" model whereby MNOs were required to interconnect with a minimum of three banks to issue electronic money, as well as share agents.⁵⁸ Although initially sparking interest in mobile money deployments, the Guidelines limited the extent to which mobile money could thrive, as compared to East African markets of Kenya, Tanzania and Uganda.⁵⁹

More progressive guidelines for operators were introduced in 2015,⁶⁰ which created traction and increased government buy-in for mobile money services. Growing evidence suggested an integral link between mobile money and the country's underbanked and rural areas, and notably, that mobile money transactions were likely to stimulate future transactions. This was directly aligned with the Bank of Ghana's mission to achieve a "cash-lite economy".⁶¹

To this end, Ghana's existing interbank hub, Gh-Link, was upgraded to allow for mobile money connection in May 2018. Prior to the introduction of hub-based mobile money interoperability, MNOs could interoperate among themselves through aggregators, such as Nsano, since 2016.

According to GhIPSS, early data on cross-net mobile money transactions suggested strong public

demand: from May to August 2018, cross-net mobile money transactions rose considerably, from a total of 90,000 to 800,000 in just four months.⁶² In November 2018, the national card scheme E-Zwich⁶³ was also connected to the hub, enabling the holistic range of use cases available in Ghana today: wallet to wallet, push and pull funds from bank accounts and E-Zwich cards.

In terms of governance, MMPs lack formal representation and decision making in GhIPSS. The GhIPSS Board of Directors includes members from the Bank of Ghana, the Ministry of Finance and the Association of Bankers. Consultations on mobile money interoperability are organised and channelled largely through the Ghana Chamber of Telecommunications.

MMPs have agreed on a common pricing range for end users whereby the receiver covers the GhIPSS processing fee (0.01%) and compensation to the sender MMP for liquidities leaving its ecosystem, given the receiver pays interchange. On the technical and operational side, SLAs have been discussed and drafted, although as of December 2019 they have not been signed.

While the integration phase was relatively straightforward, taking approximately two months for MMPs, there were other challenges. GhIPSS first set up a middleware to connect its platform running on ISO standards and the MMPs using WebService.

Following commercial launch, the most common interoperability issue was transaction failures from timing out. This was happening for two reasons: first, the hub's capacity to process transactions diligently was at stake, and the issue was addressed by splitting the single connection access point for MMPs into three phases. Second, processing delays appear to have been caused by one MMP's technical implementation, which was misaligned with the commonly agreed architecture.

57. Ghana Interbank Payment and Settlement Systems (GhIPSS) See: <https://ghipss.net/>.

58. Bank of Ghana (2008), Branchless Banking Guideline. Notice NO. BG/GOV/SEC/2015/09.

59. Mattern, M. (2018), "How Ghana became one of Africa's top mobile money markets". CGAP Blog.

60. GSMA Mobile Money (2015), "Regulatory reform: A conversation with the Bank of Ghana on the journey towards the new Guidelines for E-Money Issuers".

61. Bank of Ghana (2017), [Impact of mobile money on the payment system in Ghana: An econometric analysis](#).

62. Ghana Interbank Payment and Settlement Systems (2019), "Mobile money interoperability hits 800,000 transactions". GhIPSS Blog.

63. In Ghana, E-zwich is a biometric smartcard that facilitates interoperability between all banks and savings and loans institutions in the country, providing cardholders with access to a wide range of retail and merchant payments regardless of their home financial institution.

Salient success factors	Outcomes
Clear regulatory roadmap to interconnect different parts of the payment system.	Successful integration of banks, MMPs, and the national scheme card E-Zwich.
Staged approach whereby participants (banks and MMPs) could still route transactions through existing bilateral corridors.	Allowed participants to keep using well-functioning bilateral connections in parallel with the hub during the scale-up phase.
Responsiveness of the hub to adapt/upgrade the technical solution (split loads, interface for transaction status check and dispute resolution).	Improved initial architecture to reduce transaction failures.
Main challenges	Outcomes
Heterogeneous architecture implementation by MMPs.	Resulted in time-outs and transaction failures that had a major impact on customers' trust in the service.
Incomplete technical governance, with operational rules, SLAs and penalties not agreed upon prior to launch.	Resulted in uncertainty and lack of responsiveness when participant failures occurred.
Lack of a common discussion forum for MMPs (overseen by the Ghana Chamber of Telecommunications) and the banking sector.	Alignment between stakeholders is difficult.
No clear vision on corridor activation as not all banks have opened flows with MMPs through Gh-Link.	Measuring the progress and success of interoperability is challenging.
Unclear UX with multiple messages from Gh-Link.	Confusion for end users.

Uganda

As early as 2013, the Bank of Uganda's Mobile Money Guidelines recommended that, to facilitate full interoperability, mobile money service providers should utilise systems capable of becoming interoperable with other payment systems in the country and internationally. This "light" mandate became more pressing in 2017 when a central bank directive requested mobile money providers to become interoperable within a few months.

Since the central bank did not provide or mandate technical means of interconnection, MMPs, beginning with the two market leaders MTN and Airtel, established interoperability in the beginning of 2018 through the aggregator Pegasus. This solution leveraged existing connections between MMPs and Pegasus for other use cases, such as bill payment or bulk disbursements, and used a similar mechanism of prefunded accounts to channel cross-net P2P transactions. This solution was maintained until August 2019 when both MMPs switched to a direct bilateral connection via APIs while remaining connected to smaller MMPs through Pegasus.

Both the Pegasus and bilateral connections were relatively quick to implement, within one or two months, although the bilateral integration involved a phase of preparing and exposing APIs, which was reported to have caused some delays in enabling cross-net transfers. In the meantime, MMPs have maintained existing bilateral connections with banks, enabling push and pull transactions between mobile money accounts and bank accounts.

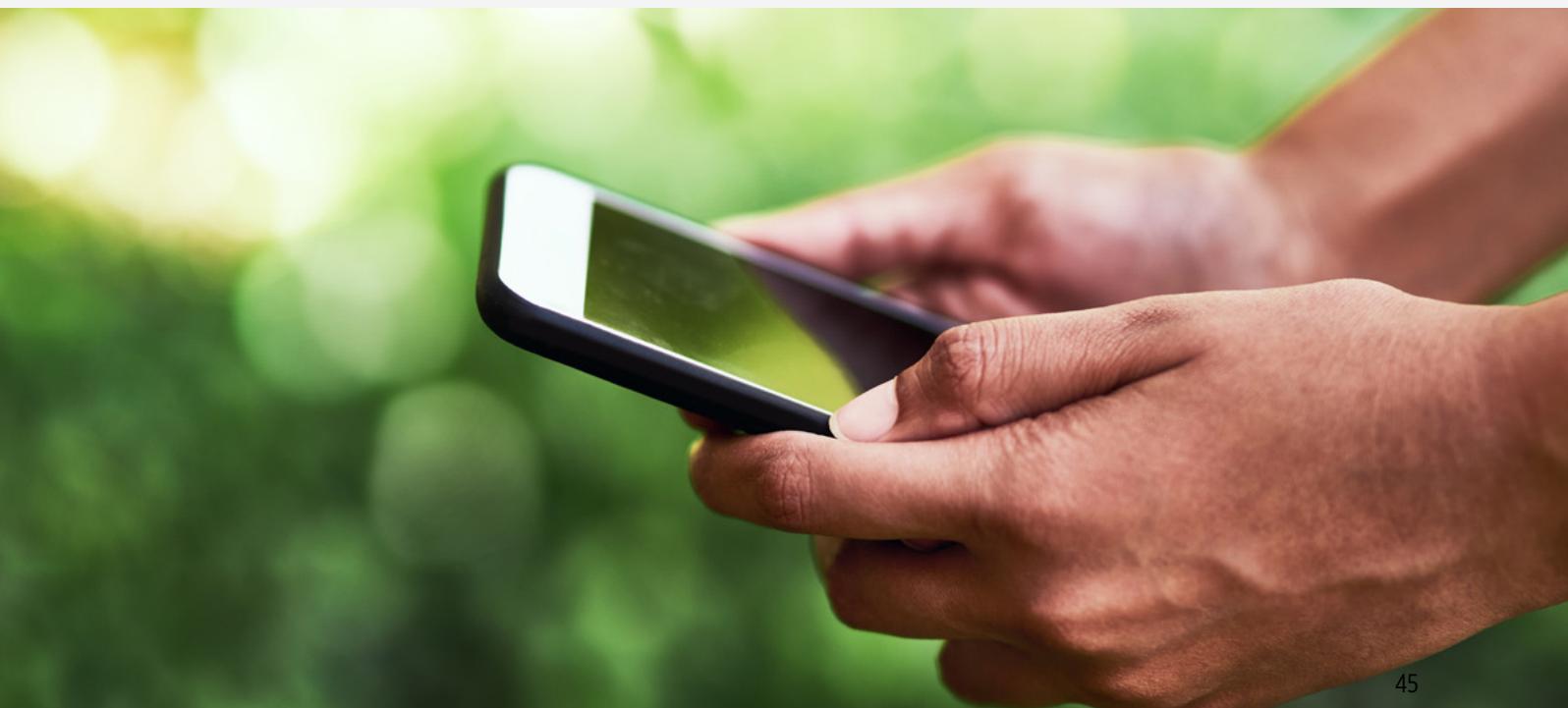
The business model for cross-net transactions is decided by participants based on a bilateral agreement and validated by the regulator. The main players have agreed on a 0.6 per cent receiver pays interchange, and MMPs apply a client surcharge for sending money cross-network, which is in line with the price for off-net, voucher-like transactions. According to several market players, the tax on mobile money transactions introduced in July 2018 had collateral damage. Since mobile money in Uganda coexists with an agency banking model, consumers began transferring money to bank accounts and then withdrawing it at a cheaper rate from a banking agent.

As of January 2020, Uganda's new National Payment Systems bill has not passed. According to market players, the bill will not have direct consequences for interoperability, although there have been talks of a centralised switch. It would, however, introduce an e-money issuer model, which would spin off mobile money activities from telecom operators and enable direct oversight by the Bank of Uganda rather than the Uganda Chamber of Communication.

Market players have not reported a surge in interoperable transactions and have reported that multi-SIM use continues to be a common practice among consumers. From January to May 2019, one year after launch, interoperable transactions enabled by Pegasus represented 0.21 per cent of the overall volume of mobile money transactions.⁶⁴ It must also be noted that interoperable transactions are priced higher than on-net ones.

64. Uganda Communications Commission (2019), [Telecommunications, Broadcasting & Postal Markets: Industry Report, Q2](#).

Salient success factors	Outcomes
Deployment was conducted by a technical aggregator specialised in connecting and integrating participants for payments.	Shortened the time to market and fostered rapid deployment.
Customer journey for cross-net transactions is aligned with on-net experience.	Eased service adoption and uptake of mobile money transactions.
Each MNO has a distinct prefix so no need for the sender to select the receiver MMP.	Simplified user experience.
Main challenges	Outcomes
Interoperability was suddenly mandated to go to market within a few months.	Limited MMPs' ability to assess different options and make a business case for interoperability. As a result, pricing of cross-net transactions is discriminatory.
Lack of technical governance and release management.	Resulted in failures and service shutdown during the bilateral connection due to unannounced changes in one MMP's API.
High tax on mobile money transactions compounded by more affordable agency banking fees.	Unfair competition resulting in a coping strategy (MMA-to-bank transfers and cash-out at bank agents), which in turn limits uptake of A2A interoperability.
Surcharge was left to the discretion of MMPs.	Hampered service adoption and transactions uptake as MMPs aligned cross-net fees with off-net voucher fees.



Appendix 5: Regulations governing interoperability in each focus market

	Regulations	Issuer	Requirement	Year
Ghana	Regulatory Framework for Branchless Banking	Bank of Ghana	Many-to-many bank-led model: MNOs need to link with a minimum of three banks to issue e-money	2008
	Guidelines for E-Money Issuers in Ghana	Bank of Ghana	Authorization for MNOs to issue e-money	2015
	Payment Services Act	Bank of Ghana	A payment service provider will have a system capable of interoperating with other payment systems in the country when required (not mandated).	2019
Jordan	Circular on Mobile Payments	Central Bank of Jordan	Launch of mobile money	2010
	Mobile Payment Service Instructions	Central Bank of Jordan	New regulatory framework for mobile money, which creates the PSP status and mandates interoperability through JoMoPay	2013
	Mobile Payment Service Operational Framework	Central Bank of Jordan	Describes the operational functioning of JoMoPay and JOPAAC	2016
	Requirements for the Provision of Services of Issuance and Management of Electronic Money	Central Bank of Jordan	Mandates connection to JoMoPay	2018
Madagascar			N/A	
Pakistan	Rules for Payment System Operators (PSOs) and Payment Service Providers (PSPs)	State Bank of Pakistan	Creates PSO/PSP status	2014
	Regulations for Mobile Banking Interoperability	State Bank of Pakistan	Creates third-party service provider status (TPSP)	2016
	Regulations for Electronic Money Institutions	State Bank of Pakistan	Allows non-banking players to issue e-money	2019
Tanzania	National Payment Systems Act and the Electronic Money Regulations	Parliament of Tanzania	Bank of Tanzania oversees mobile money services and mandates interoperable P2P transfers at no extra cost to on-net pricing	2015
Uganda	Mobile Money Guidelines	Bank of Uganda	A2A interoperability is recommended	2013

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