

Digital Finance Interoperability & Financial Inclusion

A 20-Country Scan

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This Working Paper is supported by a PowerPoint slide deck containing one-page descriptions of each of the 20 countries in the scan:

<http://www.cgap.org/interop>

Digital Finance Interoperability & Financial Inclusion: A 20-Country Scan

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Executive Summary

Interoperability—the ability for different systems to connect with one another—is attracting a lot of attention among digital finance experts. Interoperable payment systems have the potential to make it easier for people to send payments to anyone and receive payments from anyone quickly and cheaply. Financial service providers welcome the new business opportunities that would emerge from this higher volume of transactions, and policy makers see interoperability as a means to bring more poor people into the financial system, thus fostering financial inclusion.

To better understand the global landscape in regard to interoperability, CGAP commissioned Glenbrook Partners to conduct a 20-country scan that assesses the state of interoperability in select markets. The study focused on payments from and to small-value transactional accounts that are accessible to mass-market consumers. For comparability, the scan defined interoperability as the ability for a digital financial service account to make specific kinds of transactions across two or more providers.

For the scan, researchers gathered high-level data and identified three broad types of interoperability:

- *Multilateral agreements* among three or more providers.
- *Bilateral agreements* negotiated between two providers.
- *Third-party solutions* that connect providers.

The scan found that some form of interoperability is present in each market, but progress remains slow in increasing the number of use cases and volume of transactions per use case. Conditions on the ground are complex and messy, with all 20 countries in the scan showing multiple approaches in play at the same time.

The scan did reveal two broad patterns in half the countries studied. Six countries are pursuing a “market-wide” approach, whereby some type of central plan covers a majority of providers for a majority of use cases. Four countries are pursuing a “focused” approach, whereby a subset of nonbank providers have joined together to make their own arrangement, which is largely separate from mainstream banking. The remaining 10 markets do not yet exhibit a dominant pattern; for these 10, a mix of these approaches may be happening simultaneously.

Given the early stages of interoperability and the absence of substantial transactional volume data, it is not possible to draw definitive conclusions. Yet the scan did highlight some important factors:

- Interoperability is not binary; it progresses over time, and it takes years to build the volume of transactions of interoperable use cases that can contribute to research.
- Three functional elements must come together for interoperability to be effective: (1) arrangement governance, (2) business model, and (3) technical integration. Much of the focus in the countries in the scan is on technical interconnections. There has not been enough focus to date on the other elements that are critical to creating volume and economic value.
- In some countries interoperability is being discussed as digital financial services grow and mature. In other markets, discussions about interoperability start before digital financial services have made a sizeable impact. There is not enough evidence to determine the best time to consider and implement interoperability.



Interoperability: Why It's a Hot Topic

Interoperability—the ability for different systems to connect with one another—is attracting a high level of attention among experts in digital finance. For providers, there is growing demand for interoperability as a way to increase transaction volumes and create new business opportunities. For development agencies and governments, interoperability is considered important for financial inclusion because it has the potential to introduce economies of scale and scope, create network effects, and allow customers to more easily carry out desired transactions.

However, not everyone is enthusiastic about interoperability. Providers in some markets see a competitive risk in opening their proprietary networks to what some of them perceive as “free riders.” Or they may not perceive a need to make their payment systems interact with others. Interoperability must balance competition and coordination because it brings together competing providers, and it can result in winners and losers. As a result, it is often a contentious topic, with key market players having diverse views on the desirability of coordination, pace of adoption, and structure of interoperability arrangements.

Done well, interoperability promises to improve long-term financial inclusion by making it easier for more people to make digital payments. Executed poorly, it can undermine outreach to the poor by limiting their payments options. Given its immense potential, policy makers, development agencies, consulting firms, and international bodies (such as CGAP, the Bill & Melinda Gates Foundation, International Telecommunications Union, and the World Bank) perceive a need to help shape the course of interoperability to ensure better outcomes for financial inclusion.

To better understand the interoperability landscape, CGAP commissioned Glenbrook Partners to conduct a global scan. The researchers gathered high-level data on interoperability across 20 countries. A brief description of the countries, the analytical framework, and a description of what was included and excluded in the study are available in an accompanying PowerPoint slide deck (<http://www.cgap.org/interop>). This analysis of high-level patterns is not intended to provide solutions, rather it describes only the themes identified across diverse countries as of September 2016. The goal is to help advance the cause of interoperability for financial inclusion by anchoring future work within the realities of what is happening on the ground.¹

Figure 1: 20 Countries Scanned (September 2016)



1. This paper builds on previous work that CGAP has done on interoperability, including blog posts on (1) the interoperability in electronic payments with a link to a report (<http://www.cgap.org/blog/history-lesson-advancing-interoperability-mobile-money>), (2) an introduction to a three-level interoperability framework with a link to a slide deck (<http://www.cgap.org/blog/platform-level-interconnection-branchless-banking>), and (3) pathways to interoperability in Pakistan, with a link to the report (<http://www.cgap.org/publications/interoperability-and-pathways-towards-inclusive-retail-payments-pakistan>).

Interoperability: Relevance for Financial Inclusion

The many definitions of interoperability make it difficult to assess. It is hard to draw a line between different payment streams, such as traditional bank payment systems using cards and ATMs, and digital financial services (DFS), which usually are more oriented toward financial inclusion. There are also many layers to interoperability, which is often described in terms of payment switches or a technological set-up, but these are not always relevant to mass-market users. More vexing is that descriptions of payment systems mean that interoperability can be achieved in multiple ways, thus making comparisons difficult.

To focus analysis on financial inclusion, this scan uses the following definition of “interoperability” as it relates to financial inclusion:

The ability for mass market users of DFS accounts to perform specific use case payment transactions between accounts at different providers.

Two core concepts underpin this definition: DFS accounts and use cases.

DFS accounts. Small-value transactional accounts aimed at large portions of the mass market, often oriented toward financial inclusion. These accounts often include tiered know-your-customer requirements and can be issued by banks or nonbanks. The accounts must also be accessible over a digital channel (e.g., phone, agent, cards, or merchant network) and be able to transact instantly. A subjective assessment was made of which accounts to include in each market. The classic example is the nonbank-issued mobile money account that is popular across regions such as Africa, but the definition extends to bank-issued, low-value accounts in markets such as Mexico and Pakistan. The types of accounts included for each country are listed in “Digital Finance and Interoperability” (<http://www.cgap.org/interop>).

Use cases. DFS accounts can serve several specific transaction types or “use cases.” The use cases included in this survey are person to person (P2P); person to business (P2B), including merchant and bill payments; bulk payments, including government to person (G2P) and business to person (B2P); and cash-in and cash-out (CICO). In a given market, only some use cases might be interoperable. This focus on use cases underscores the fact that interoperability that is relevant for financial inclusion is not only about exchanging transactions seamlessly among providers; it is also about deploying the agent infrastructure with CICO access points playing a central role. These access points need to be paid for, and interoperability can help define how parties are compensated for building this infrastructure.

Findings

Collectively, the 20 countries reviewed in this study provided valuable information on the state of interoperability in low-income markets. This information can be used in global comparisons.

Three different types of arrangements exist to achieve interoperability.

Arrangements that enable use cases to be interoperable can be broadly categorized into the three types: multilateral agreements, bilateral agreements, and independent third-party solutions. Arrangements can be at the governance (key decisions on arrangement design, decision-making rules) and business level (business model, contract, pricing, etc.) and the technical level (technical implementation of interoperability). In this paper, we primarily focus on use cases at the governance level. As described in Table 1, each arrangement can have several possibilities for technical implementation.

Table 1: Three Interoperability Arrangements

Key Features	Multilateral Agreements	Bilateral Agreements	Third-Party Solution
Participants	More than two DFS providers.	Two DFS providers.	DFS provider and a third-party solution provider, such as switch or aggregator.
Operational and business rules	Agreed by all parties, then applicable to subsequent members.	Agreed on by the two providers.	Agreed by third party and provider. Often set unilaterally by third party. Provider may have ability to negotiate depending on its size/volumes.
Pricing, including transparency to customers	Provides optimal (potential) alignment and transparency through broader market coordination.	Pricing more difficult to align and effectively communicate—similar to voice roaming.	Potential for single price without coordination through third party, but less provider transparency.
Technical implementations observed	<i>Switch</i> <i>Bilateral Connection</i> <i>Third Party/Aggregator</i>	<i>Bilateral</i> <i>Third Party/Aggregator</i>	<i>Third Party/Aggregator</i>

1. **Multilateral agreements** include three or more providers and a formalized set of shared common rules. Multilateral agreements may include some providers, but may not necessarily include a majority of providers in a given market.
2. **Bilateral agreements** exist between two providers who transact directly with each other on agreed terms. Similar to the global voice roaming business, the two parties negotiate directly to set rules, pricing, and other related considerations for interoperability. From a consumer perspective, this can make terms and conditions and pricing nontransparent, because they are unique to every bilateral agreement and, therefore, difficult to communicate.
3. **Independent third-party solutions** can play an important role by facilitating transactions between providers. Third parties connect two providers or connect an end customer to providers. These third parties do not issue accounts (stores of value) themselves; they connect other providers. Users of the service are not necessarily part of a scheme of co-equal participants and do not necessarily have a direct relationship with each other. In some countries, aggregators offer these third-party solutions.²

All 20 countries have some form of interoperability.

Some basic form of interoperability exists in each of the countries surveyed. The most common arrangements are bilateral agreements and third-party enabled interoperability. A typical example of a bilateral agreement in these markets is a mobile money provider entering into an agreement with a bank to exchange payments. Third parties may serve the same market by connecting banks and mobile money providers indirectly. For example, a bill aggregator may be able to accept bill payments from anyone and has a process to ensure these funds land into the account chosen by the biller.

2. CGAP 2016. "Aggregators: How They Work and Why They Matter." Blog series. <http://www.cgap.org/blog/series/aggregators-how-they-work-and-why-they-matter>

However, progress toward meaningful interoperability is still nascent.

Perhaps more important than whether interoperability exists is the question of whether interoperability is expanding access to financial services. The most objective evidence of progress is whether consumers are actively transacting between provider accounts. Data on transaction volumes are difficult to find in many countries, despite lengthy searches and repeated requests, and the very absence of available data forces us to conclude transaction volumes between providers are low in those markets.

Substantial data are, however, available for at least three of the countries studied: India, Pakistan, and Tanzania. Data are presented later in this paper, but even among these countries, which could be considered “more advanced” on interoperability, transaction levels are relatively low, although they are rising rapidly in India and Tanzania.

Interoperability is complex and often messy.

It is easy to think of interoperability as binary, but in reality there is a broad spectrum of interoperability in a market:

- How many interoperable use cases have been developed?
- How widely are these being used?

In many markets, multiple arrangements for interoperability co-exist. Participants in multilateral agreements may also have additional bilateral arrangements for the same service with other parties.

For example, a group of providers in Tanzania has created a multilateral arrangement—defining operating rules and governance collectively, but leaving detailed business agreements and technical integration to be handled bilaterally between providers. It is also limited to the P2P payment use case. The same providers rely on third parties (e.g., aggregator Selcom) for other use cases and engage in wholly bilateral arrangements with other providers for transfers to bank accounts.

The case of Tanzania illustrates how difficult it can be to categorize interoperability arrangements.

Two distinct patterns in the journey toward multilateral interoperability are discernable across countries.

Although it can be difficult to categorize countries given that multiple approaches may co-exist in a single market, two patterns stand out in their approach to multilateral interoperability.

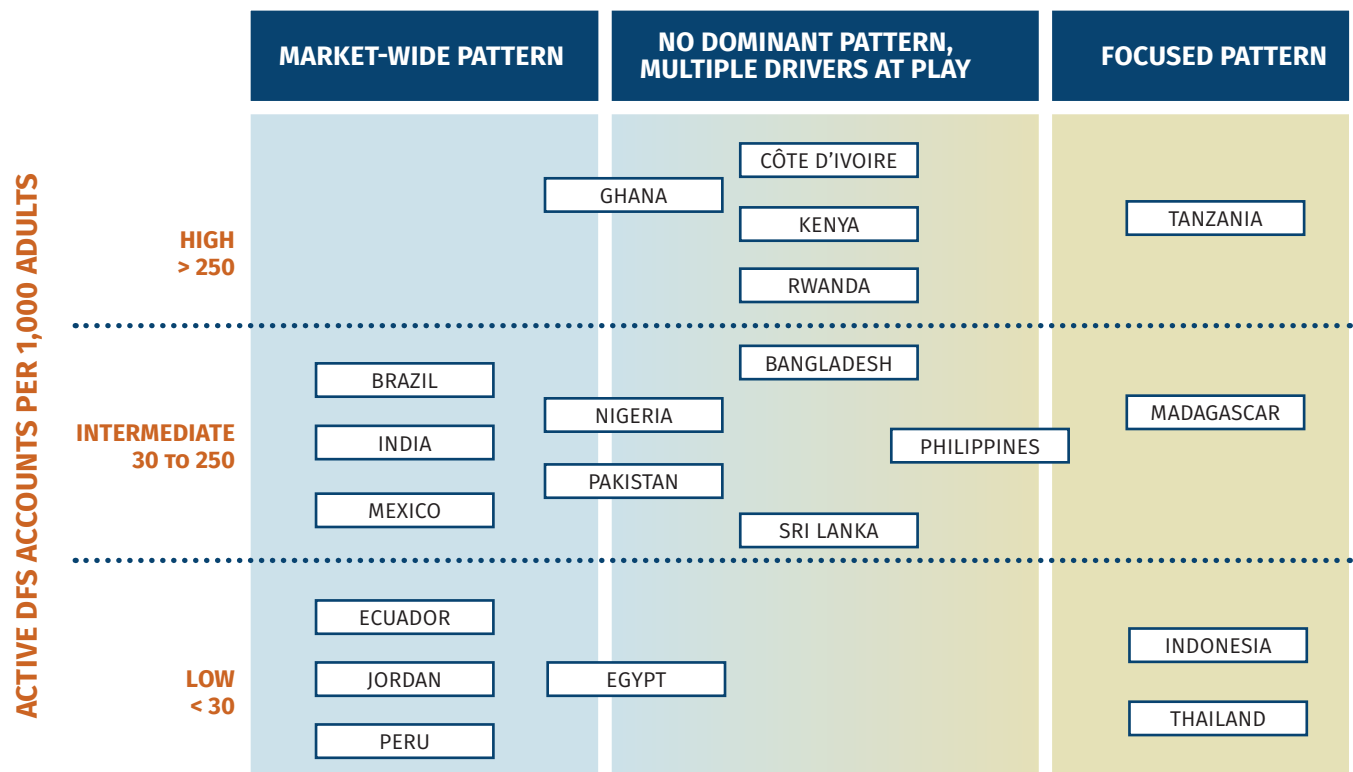
- 1. Market-wide:** Brazil, Ecuador, India, Jordan, Mexico, and Peru. Six countries studied followed some type of central blueprint for interoperability, covering a majority of providers and a majority of transaction types. These market-wide blueprints are ambitious plans and are often driven by a regulator or organization close to the government, such as the National Payments Corporation in India. However, a market-wide approach can also be driven by an industry body, such as the Bankers Association in Peru. It is notable that the countries in this category are ones where the government plays a strong role in the financial system. Three of them—Ecuador, Jordan, and Peru—are relatively small countries with early-stage DFS markets.
- 2. Focused:** Indonesia, Madagascar, Tanzania, and Thailand. In at least four countries, a subset of providers is developing “focused” arrangements for interoperability. They are solving interoperability only for specific

use cases, notably P2P, and not all DFS providers are expected to join, largely because arrangement governance is such a challenge to negotiate among multiple competitors. These bilateral or multilateral arrangements do not typically link with the wider banking infrastructure in a country, and it is not a coincidence that these providers are almost universally backed by mobile operators. As nonbanks, either they have been excluded from bank payment systems or they chose not to join.

In Tanzania, the four licensed mobile money providers established their own scheme. Several banks were part of the initial discussions, but the decision to focus first on the P2P use case meant that banks are not a part of this multilateral scheme. Links to banks are still managed through bilateral agreements and third parties. Indonesia, Madagascar, and Thailand have similar early-stage efforts underway, driven by a small subset of providers and typically not connected to a central banking system.

A focused approach typically begins with a single use case, often P2P payments. The multilateral agreements supporting the arrangements may evolve to include other use cases. Markets where nonbank players have driven recent growth in digital finance are the same as those where interoperability arrangements are beginning within a smaller group of providers. The arrangement probably reflects a regulatory decision taken years earlier to allow nonbank financial service providers to develop solutions to digital finance.

Figure 2: Country Patterns (September 2016)



Note: This categorizes countries by the dominant characteristics observed in the scan as of September 2016. In each country there are more things happening than what is shown, and it's likely that some countries will shift categories over time as circumstances change.

Table 2: Interoperability Arrangements by Country^a

Country	Level of active DFS accounts per adult	Pattern	Multilateral	Bilateral	Third party
Bangladesh	Intermediate	No clear pattern		X	X
Brazil	Intermediate	Market-wide	X	X	X
Côte d'Ivoire	High	No clear pattern		X	X
Ecuador	Low	Market-wide	X		
Egypt	Low	No clear pattern	X	X	X
Ghana	High	No clear pattern		X	X
India	Intermediate	Market-wide	X		X
Indonesia	Low	Focused	X	X	
Jordan	Low	Market-wide	X		
Kenya	High	No clear pattern		X	X
Madagascar	Intermediate	Focused	X	X	
Mexico	Intermediate	Market-wide	X		X
Nigeria	Intermediate	No clear pattern	X		X
Pakistan	Intermediate	No clear pattern	X		X
Peru	Low	Market-wide	X	X	
Philippines	Intermediate	No clear pattern		X	X
Rwanda	High	No clear pattern	X	X	X
Sri Lanka	Intermediate	No clear pattern		X	X
Tanzania	High	Focused	X	X	X
Thailand	Low	Focused	X	X	

a. This includes interoperable arrangements for any/all use cases.

As of September 2016, neither of the approaches has emerged as a dominant driver in the remaining 10 markets. Often, a mix of both approaches is used. In Pakistan, DFS account providers (“branchless banking” in local terminology) have joined the conventional interbank fund transfer switch. It is possible that this is a transitional situation with other alternatives for interconnecting arising over time.

A different set of circumstances exists in Kenya and Bangladesh, where the digital finance market of each is dominated by a single large provider—M-Pesa in Kenya and bKash in Bangladesh. Some bilateral agreements exist between these two dominant providers and other providers.³ In neither country is the dominant provider part of a widely used multilateral arrangement. And as dominant players, there are few incentives to build or join such schemes.

In other countries, such as Ghana, regulators have previously mandated a market-wide approach, but after failing to gain acceptance from providers, they are now revisiting this approach. Some countries with the highest penetration of DFS do not yet have a strong interoperability direction, whereas a few countries where DFS accounts are still very limited—such as Jordan and Peru—have already moved down the path toward a market-wide blueprint.

3. For example, bKash enables account holders to cash out at BRAC Bank ATMs.

A few countries show recent rise in interoperable DFS transactions.

Data on interoperable transactions across providers are available from three of the countries studied: India, Tanzania, and Pakistan. At least one interoperable arrangement that is relevant to DFS accounts and data made available exists in each market.

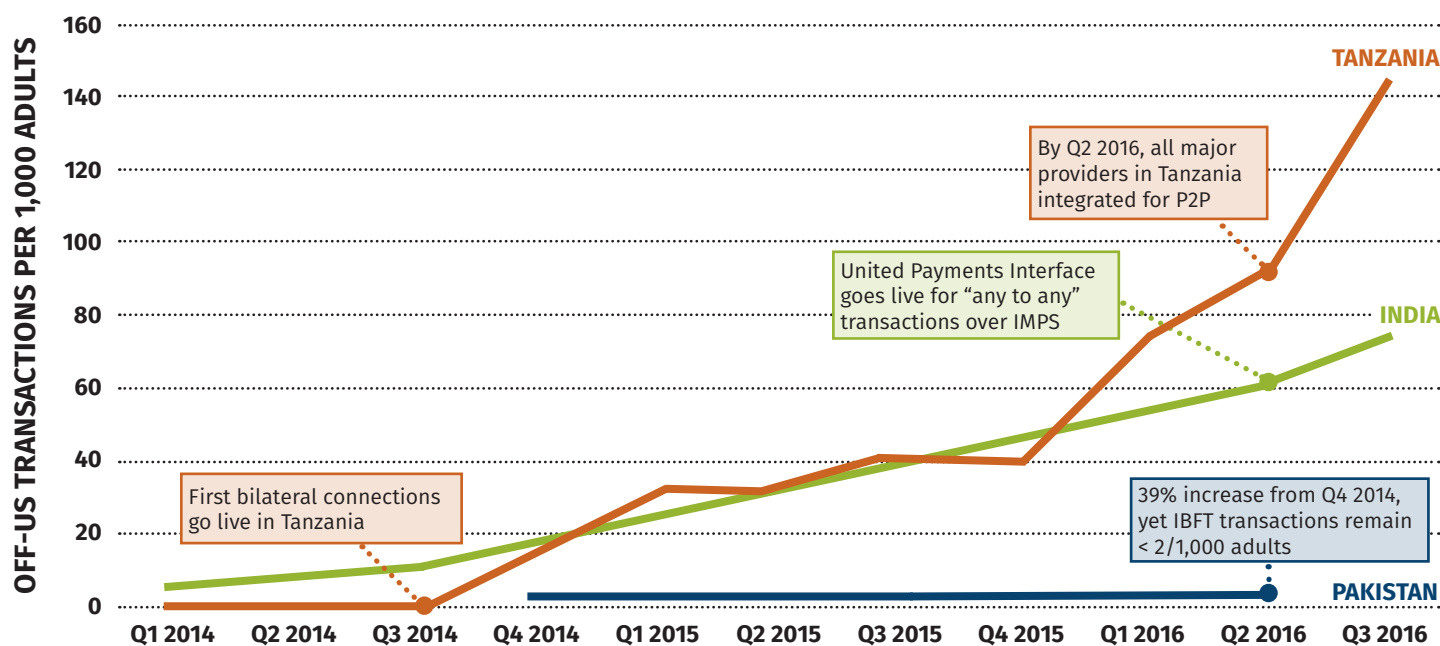
It is important to note that only moderate comparability can be achieved across these three countries. Each arrangement targets low-income, mass-market consumers, but as Table 3 highlights, the characteristics of these arrangements can be quite different.

Table 3: Source of Data for Interoperability Volumes in Three Countries

Country	Interoperable arrangement	Participating providers	Accounts
India	IMPS (under National Payments Corporation)	151 banks 24 Nonbanks	Bank and prepaid
Pakistan	IBFT (under 1Link Switch)	34 Banks	Bank and branchless banking
Tanzania	Mobile Money Scheme	4 Nonbanks	Nonbank mobile wallets

Comparing these three arrangements, each in a different country, Figure 3 plots “off-us” transactions (transactions between providers) across countries of different sizes by counting transactions per 1,000 adults.

Figure 3: Interoperable Transactions over Time



India and Tanzania have surpassed 60 transactions per quarter per 1,000 adults, with Tanzania growing more than twice this number during 2016.

Tanzania's mobile money scheme admitted its most recent participant only in February 2016, expanding to all four mobile providers. Volume accelerated during 2016. India's IMPS has been around longer and includes many more conventional bank accounts, though it is open to small-value transactions accounts. In India, eight payment banks will connect to IMPS (and other NPCI schemes) as they are launched.

In Pakistan, technical connections are enabled under the country's 1Link banking switch. This arrangement allows for account-to-account payments between branchless banking accounts and bank accounts. However, transaction volumes have not grown. A CGAP diagnostic exercise found that the Interbank Fund Transfer scheme pricing was not designed for small-value, mass-market-oriented accounts and transactions.⁴

As data for India, Tanzania, and Pakistan are updated and data from other countries are added to the evidence base, we will be able to learn more about meaningful progress on interoperability.

Conclusion: Implications for Interoperability and Financial Inclusion

Interoperability is a complex, multidimensional puzzle in most markets. This scan shows how challenging assessing the best pathway for achieving interoperability can be. Many approaches are being pursued, often simultaneously in the same country, and no clear meaningful success stories have yet emerged.

That said, CGAP holds that three functional elements must come together for mass-market interoperability to work:

- **Arrangement governance and operating rules.** Effective rules must be established for how those who oversee the systems make decisions about shared processes and rules, manage operations, and manage risk. These decisions are critically important because they require bringing competing interests together, balancing cooperation with competition.
- **Business agreements and incentives.** Business models must make sense in respect to balancing the economic interests of interoperability participants. The scheme must provide sufficient commercial incentives over how transactions are priced and who bears counter-party risk for providers to want to join and play by the rules. This is made more complex in that not all providers have the same incentives, and some may be more or less affected as interoperability gains traction. This is particularly important—and difficult—to figure out in the case of CICO infrastructure.
- **Technical integration.** A technical infrastructure to connect participants and transfer payments and related data must exist. This can mean anything from a payment switch to bilateral connections to a third-party service, with their own sets of accounts with each provider.

The level of development of these three functional elements is uneven in the countries studied. These processes are not linear and building them may be faster in some areas than in others. In the 20 countries surveyed, the different approaches appear to favor one aspect of the three critical elements over others in their early stages.

A market-wide blueprint country has the advantage of focusing on the technical integration over the long term by developing the capacity for multiple use cases from the start and connecting a majority of providers. This is the case with NPCI in India, where over 140 institutions are already connected. While it emphasizes technical connections, it is less clear whether the arrangement governance and business incentives will enable large uptake. NPCI, as a large quasi-public utility, will soon have a new class of payment banks join, but it remains to be seen

4. Pricing is set to pay a modest fee to the acquiring bank on withdrawals, though this may not provide sufficient incentive for cash-in.

how pricing and other incentive structures affect financial inclusion. New payment banks are only now launching, and it is not clear yet how the NPCI blueprint will affect business models that reach the poor.

While a “focused” approach is more limited in scope, it has the advantage of building directly from provider needs. Tanzania illustrates this well, as the four mobile money providers jointly started with a single use case—P2P—that is experiencing high transaction growth. This group’s governance and business priorities appear strong. But the technical connections are still done bilaterally between the four providers. This carries associated inefficiencies. The provider has to manage three separate bilateral connections instead of just one via a switch, and it needs to hold a larger cash cushion, because of the need to prefund against each counterparty payment rather than holding a net position. It is also not clear when or how the arrangement might connect to the broader banking payment system or incorporate additional use cases. There is also a risk in focused approaches that certain standards and norms are applied that later prevent wider connections; none of the four has yet to connect with wider bank payment systems in a meaningful way. Change may be even more difficult if entrenched interests prevent wider connections and more use cases over time.

Pakistan is another example that usefully illustrates some of the challenges to interoperability. Some providers chose to integrate DFS accounts into the conventional banking switch 1Link, thus achieving technical connections very quickly. However, it has not produced high use because the pricing rules were not written for these kinds of transaction sizes or use cases. In terms of arrangement governance, 1Link is still governed by 11 larger banks that do not provide DFS accounts. So Pakistan has more work to do on governance and business incentives for interoperability to work better.

In the scan, one use case continued to cause more confusion than others: interoperability for CICO. This involves shifting money into digital form and vice versa and, therefore, implies a physical cash presence and the associated cash management costs. CICO remains vital for financial inclusion, but the cost of handling cash makes it hard to create a viable business model. The cost of CICO likely requires a very different business model. P2P, bulk payments, and P2B do not necessarily involve cash, although in many instances there is still a CICO transaction at some point, and they have different business model implications, making it hard to identify one approach. It is not as simple as setting a single price, and it may require more experimentation and time to solve, underscoring once again how nascent interoperability is as of September 2016.

What questions should stakeholders be asking?

This high-level scan reveals the complexity and challenges of the early stages of interoperability. There may not be easy solutions or quick fixes. It is likely that interoperability is going to be a process that will build over time.

Our experiences also suggest that payment systems experts can have quite different views on the best path forward. Therefore, it is important to ask the right questions, and the scan underscores a series of key questions that are important to keep at the forefront:

- What is the right posture for the government in a given country to take? Should government stand back and let industry lead or should government have a stronger hand in making things happen?
- Is it possible, even desirable, to promote more than one approach?
- Does it matter whether the DFS ecosystem is flourishing already, and in what way will interoperability promote (or possibly suppress) DFS? For example, does timing matter?
- Have we gone beyond technical connections and given sufficient attention to arrangement governance and business incentives?
- In terms of technical implementation, which approach is best and which will be most efficient over time? In the case of Tanzania, the P2P interoperable use case was launched relatively quickly via bilateral connections but may reach a plateau as it is less efficient than a switch.
- What is the best way to solve for CICO interoperability? The economics and adequate incentives for account interoperability seem to be very different than those for access-point interoperability.

In summary, market-wide approaches with centrally driven blueprints appear to be a stronger choice than focused approaches for building a broad set of connections that leverage multiple use cases. However, their emphasis is more on the technical architecture and less on the reasons providers participate. Focused approaches driven by smaller groups of providers have a narrower range of use cases to start, but appear stronger on business models and rules.

Perhaps countries could consider other options that incorporate elements from both of these approaches. At this stage, it is too early to draw definitive conclusions because a third pattern could yet emerge. Figuring out the optimal timing will be important. Some markets are pursuing a market-wide approach even before large numbers of transaction accounts are active in the market (Peru, Jordan, and Egypt). Stakeholders in these countries are driven more by a central view about the benefits of coordination and efficiency, and appear less driven by the need to build a clear business case at the beginning. At the opposite end of the spectrum, several markets with high transaction volumes show no significant push for interoperability (Kenya and Bangladesh). These markets have dominant providers with strong business incentive to delay interoperability. The trade-offs between competition and coordination change with market competitiveness, digital account penetration, and the economics of local markets—and all of this changes over time.

The global scan helped illustrate some patterns and trends in interoperability initiatives, but overall it revealed how complex and messy early stages can be. CGAP will continue to track progress over time and begin to formulate answers to these critical questions.

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