INTEROPERABILITY AND THE PATHWAYS TOWARDS INCLUSIVE RETAIL PAYMENTS IN PAKISTAN

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EXECUTIVE SUMMARY

1. *Interoperability of retail payment instruments is not an objective in its own right; rather it is a means of achieving other desirable objectives.* Interoperability can promote a range of intermediate objectives such as greater productive efficiency, convenience for customers and dynamic efficiency through promoting competition within the financial sector. However, the attainment of intermediate objectives like these must be prioritized and sequenced in order to reach broader desired outcomes. In Pakistan, two such wider outcomes are relevant: first, the goal of greater financial inclusion; second, the goal of reducing the use of cash for government payments. These two goals may be combined in the vision of an 'inclusive cash lite' society, in which cash is still used but is no longer pervasive.

2. An *inclusive cash lite society* is one in which a high proportion of adults have an electronic store of value and use it to make electronic payments of various types. It therefore requires a high level of financial inclusion but also helps promote inclusion since the high cost of cash handling deters usage of these services. As a way of calibrating this objective, *we suggest a target of 100 million people using electronic financial services by 2020.* This is a very ambitious target, many times the current number; however, it merits consideration because, in a similar period to 2011, voice services have been delivered to more than 100 million subscribers in Pakistan.

3. *Meanwhile, there has been considerable progress in the rollout of branchless banking in Pakistan since it was introduced four years ago, although it has been slower than some had hoped.* To date, over-the-counter (cash-to-cash), rather than account-based, transactions have dominated branchless banking, and the two current leading providers do not yet connect their m-wallets to the retail payment system.

4. *Achieving 100 million banked clients will require a very substantial investment both by account issuers and by providers of cash handling infrastructure*. Using current middle income country norms, an increase in financial inclusion of this magnitude would require a massive increase in the number and spread of financial touchpoints over and above the total of 74,000 branches, ATMs, POS and agents already in existence in 2011. Branchless deployment is essential to reduce the capital expenditure required, but *the investment required is still likely to exceed $2 billion in aggregate*. Additional new clients are unlikely to be able to generate much revenue on transactional accounts alone. It is therefore challenging for business models to meet these targets.

5. *Interoperability affects the incentives of financial providers to provide and consumers to use financial services*. Interoperability can reduce costs through greater efficiency of infrastructure deployment and may also increase competition between providers in ways which results in cost savings being passed on to customers. However, moves to promote interoperability should harness, not undermine, the business case for private providers to make investments of the required scale. On the consumer side, greater interoperability enhances the proposition to use electronic payments, since users can access a wider network of payees. Without greater usage by consumers, even cost-efficient models will not succeed.

6. *Interoperability in key retail payment use cases is a necessary but not sufficient means of reaching the desired end goals of massive adoption.* To have the necessary effect, interoperability should enable both a) cost reductions passed on to customers, and b) strong positive network effects on demand side. Scenarios which have one but not the other are likely not to have sufficient velocity to sustain massive increases. If neither occurs, the trajectory will be modest.

7. *The term 'interoperability' is often used loosely, is not well understood in practice among stakeholders, and is not measured with precision.* To define and measure it better, we propose a three step process which first distinguishes clearly the interoperability use case (in terms of the store of value, instrument and transaction type, and channel involved). It then assesses the number of accounts which qualify at each of five possible levels of the interoperability. Finally, that number can be converted to a percentage by choice of an appropriate denominator. Platform, agent and customer level interoperability as previously identified by CGAP are specific 'flash point' use cases for each of which the level and associated proportion of interoperable accounts can be measured.

8. We apply this methodology to *measure the current level of interoperability achieved in relevant three use cases* in Pakistan:
    (i) *Card-based ATM withdrawals,* in which 100% of card-carrying accounts are interoperable working in any bank's ATMs, at both the functional and effective levels
    (ii) *Interbank Funds Transfers* (IBFT), in which 46% of all bank accounts are interoperable for real time transfers of value, at least at the functional level
    (iii) *Cash in/cash out at agents*, in which mobile wallets are interoperable at the theoretical level but the interfaces do not yet exist to enable interoperability at other levels or with other account types.

9. *The history of interoperability in Pakistan shows diverse drivers and outcomes:* on the one hand, ATM interoperability dates back to a 2002 mandate from the State Bank that all banks connect to one of two card switches, and then that the switches interconnect to each other. Most Pakistani stakeholders viewed the outcomes of this action as positive: the numbers of ATMs deployed and switched transactions have increased substantially since then, although Pakistan has fewer ATMs per capita than expected for its level of income, which may result from fees being too low. On the other hand, using the switching infrastructure created for ATMs, one of the payment switches voluntarily introduced inter-bank funds transfers (IBFTs). IBFTs are real time electronic credits between bank accounts. However, not all member banks have enabled IBFTs at all or for all account types and the two switches do not yet interconnect for this payment type.

10. *Introducing third party service provider (TPSP) regulations may be useful* in enabling efficiencies in processing and switching, but if fragmentation of switching results, it could undermine efficiency gains. However useful they may be, TPSPs as envisaged in the regulations are *not necessary for the achievement of the desired outcomes, and are certainly not sufficient*.

11. *A managed approach to interoperability avoids some of the risks of the traditional polar extremes of 'intervene now' (ex ante) or 'do nothing until problems arise' (ex post). A managed approach sets milestones when interoperability should apply to clearly defined use cases, and, if the milestone is missed, intervene as needed.* The appropriate timing and nature of milestones can be established only in the context of a wider framework for the development of the retail payment sector as a whole. For example, based on current provider plans, full platform interconnection for IBFTs could evolve naturally within the next year. Because it is a key building block for other interoperability,

SBP could affirm this evolutionary process by setting the milestone for IBFT-related use cases to interconnect within a year. Agent level interconnection will take longer because deployment is at an earlier stage but can reasonably be expected, or else required, once a critical mass of agents has been deployed and clients acquired.

12. Considering a range of possible policy measures related to interoperability, *we recommend that:*
    (i) PTA clarify its directive around fair access to priority MNO bearer channels such as USSD for any licensed branchless banking service on terms equivalent to those offered by any MNO to its own subsidiary or affiliated mobile financial service.

    (ii) SBP not mandate interconnection of agents for cash in and cash out until deployment has reached a defined critical mass if it has not been achieved naturally by then, but that SBP should signal that interconnection of agents for cash will ultimately be expected, and mandated if it does not result spontaneously.

    (iii) SBP establish a milestone within a relatively short period (such as year) for interconnectivity for IBFT to extend to all 1LINK banks, between the two switches and between bank accounts and mobile wallets. If this were not to take place through interbank negotiation, then SBP would reconsider mandating this form of interconnection.

    (iv) SBP consider authorizing and supervising e-money issuers to issue electronic stores of value.

    (v) SBP collect the data necessary to monitor interoperability in an ongoing fashion; as well as to research customer payment behaviour in a systematic fashion, in addition to or linked to other market surveys contemplated.

    (vi) SBP, with PTA and other relevant government agencies, appoint a task force which includes private sector experts to recommend a retail payments roadmap which will achieve specified outcomes, such as the “inclusive cash lite” vision.

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1. THE FINANCIAL INCLUSION JOURNEY IN PAKISTAN

1.1 General context: is the glass half full, or half empty?

> *"Presently, the country is witnessing the beginning of a new retail banking revolution whereby a large segment of the population, previously unbanked, has started entering into a new realm of financial services."*[1] Development Finance Group, State Bank of Pakistan, 2012

The glass is half-full…

The quotation above comes from the most recent branchless banking newsletter from the State Bank of Pakistan (SBP), which provides data on the state of the branchless banking sector at the end of 2011. The numbers show a strong upward trend in the volume of transactions, which totalled 20.6 million in the quarter ending in December 2011.[2] The number of mobile wallets has also increased three-fold between 2010 and 2011. The number of agents associated with branchless services increased by some 15% in the last quarter of 2011 to reach 22,512, already covering an impressive 86% of districts in Pakistan. Furthermore, although there are at present only two dominant providers, which have been active since 2009,[3] the apparent success in uptake is exerting a compelling demonstration effect. A 2011 CGAP Brief names six new entrants, including other major banks and microfinance banks associated with MNOs, which have obtained pilot or in-principle approval to launch, and a further three applicants to enter the branchless banking services market.[4]

The State Bank has also achieved international recognition for its enabling approach which has created a climate of certainty through the promulgation of branchless banking guidelines. Unlike most developing countries, Pakistan already has a unique national identity card in widespread usage, and the card has helped facilitate robust KYC processes. Moreover, following successful pilots, the government is moving to convert some of its large cash transfer programs such as the Benazir Income Support Program (BISP) from cash to electronic basis.

All these factors suggest a positive outlook for financial inclusion in Pakistan, driven largely by branchless approaches, which imply that a young sector is now developing.

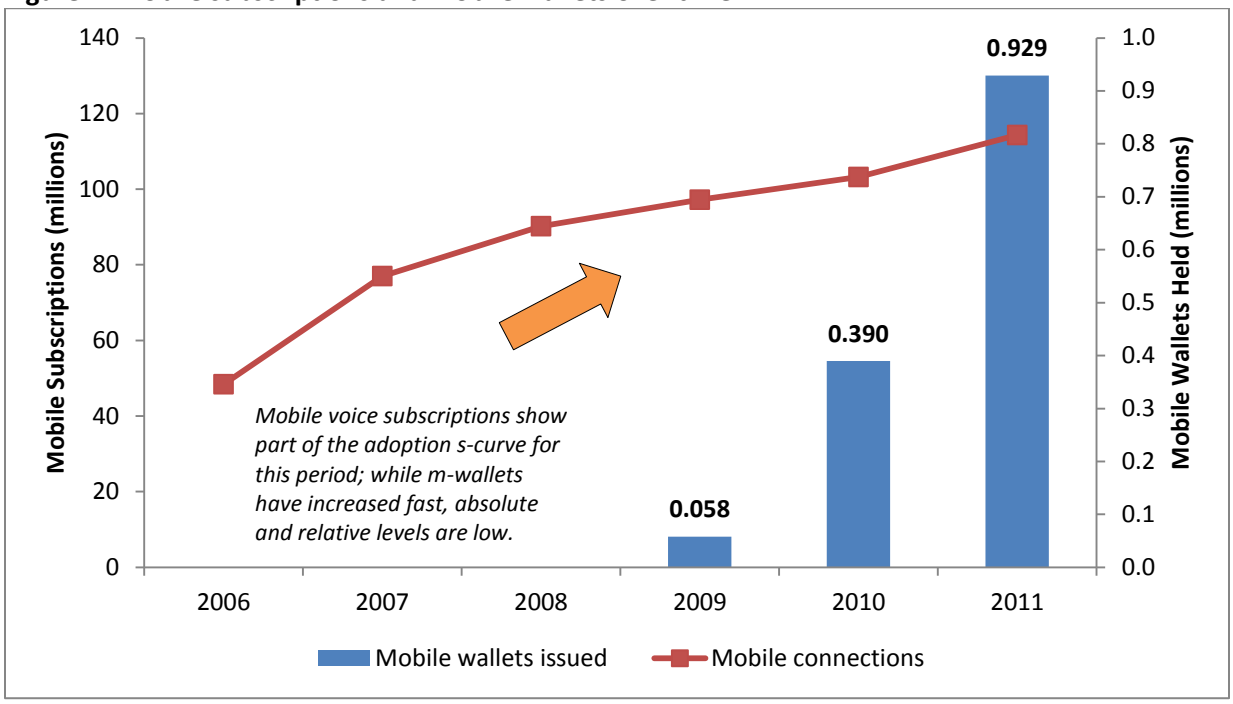
… or the glass is half-empty

However, some stakeholders voice concerns about the pace of development. Despite the new services, formal financial services penetration in Pakistan remains low by any measure: bank accounts numbered roughly 25 million, or 20% of the adult population over the age of 15, while the Findex survey found only 10% of adults reported using a formal financial service in 2011. (For reference, consider that mobile networks have added 26 million new voice subscribers to reach a penetration of 64%, as shown in Figure 1 below).[5] The process of launching account-based mobile financial services has been slower and more complex than some hoped, although not out-of-line with the expectations of providers which initially promoted over-the-counter transactions as a deliberate choice based on business case and regulatory concerns). Account-to-account transfers comprised little more than 1.5% of transactions by volume in the fourth quarter of 2011, and most transactions were over-the-counter (OTC) transfers involving the

[1] Branchless Banking Newsletter, SBP, October to December, 2011, pg.4
[2] Branchless Banking Newsletter, SBP, October to December, 2011, pg.4
[3] http://www.easypaisa.com.pk/index.php/en/media-center/-press-releases?act=detail&arid=112
[4] For more information on entrants, see CGAP Brief: "Branchless banking in Pakistan: A laboratory for innovation", available via http://www.cgap.org/p/site/c/template.rc/1.9.55438/
[5] See for example the 2011 blog post of PTA chairman Yaseen which makes this point powerfully: http://www.yaseen.pk/ict.asp

handover of cash for the agent to initiate transfers for bill payments.[6] The trend in usage of account-based services so far does not yet show signs of accelerating mass adoption.

Figure 1: Mobile subscriptions and mobile wallets over time



Sources: Wireless Intelligence, State Bank of Pakistan

While overall volumes of mobile payments have increased quite rapidly, comparisons to other countries demonstrate that the take up of mobile wallets lags: at less than 1% of the total mobile subscriber base after three years, it is below the take-up rates witnessed in shorter periods in other countries such as Cote d'Ivoire or Mali.[7] Fewer than 1% of adults reported using a mobile to send or receive money in 2011, a level well below those reported in countries like Kenya, Philippines, or South Africa which have had commercial mobile financial services for slightly longer than Pakistan (since 2007, 2004, 2005 respectively).[8]

Furthermore, the level of policy uncertainty related to this sector has risen recently:

1) Many current and prospective providers do not yet fully understand the need for the Third Party Service Provider regulation (TPSP) (draft dated 2012) which has been developed by the Pakistan Telecommunications Authority (PTA) and SBP under an memorandum of understanding agreed last year, and provides for a new category of provider for which interconnection to MNOs and banks is mandatory;
2) The Competition Commission has recently signalled its intent to issue a formal order to the banks that are members of the largest switch, 1LINK, to justify why their uniform pricing for not-

[6] Branchless Banking Newsletter, SBP, October to December, 2011, pg.4
[7] BFA (2010) *Mobile Market Structure and Mobile Money,* report for CGAP; see also the recent MMU report *State of the Industry 2011*, which makes the point that comparison of different services is not straightforward and compares payment volumes to subscriber base. If for example the number of unique OTC customers were counted as a proxy for the customer (base who may adopt m-wallets in future), which is not publicly disclosed at present, then rate of customer adoption of the service may well be more in line with peer experience, other than Kenya.
[8] World Bank (2012), Global Findex database

on-us transactions, which has prevailed since ATM card was first achieved in 2006, is not collusive and anti-competitive.

As Table 1 below captures (see line 6), a wide range of views exists among stakeholders interviewed for this report as to whether the achievement of 'full interoperability' between existing retail payment systems such as card or interbank funds transfers will be an inevitable development over time. There is a similar diversity of opinion on the question of whether such future interoperability will require a particular switch structure, such as one national switch, to achieve the efficiencies and economies of scale necessary to keep costs low (line 5 in Table 1). There is also general ambivalence as to whether there is a common understanding of interoperability in Pakistan, although banks agree the least on this, and the telco sector the most.

Table 1: Consolidated opinions of stakeholders in Pakistan to statements presented in interviews

Responses on a scale of 1=fully agree; 5=fully disagree

	Statement	Government (n=4)	Banks (n=5)	Telcos (n=4)	Others-switches/ tech (6)	Overall
1	There is a common understanding among key players in the financial sector in Pakistan of what interoperability means.	2.5	4	2	3.5	3
2	The State Bank has played an important role in promoting interoperability in the past.	2.8	2.6	3.3	2.5	3
3	Electronic payments are already highly interconnected in Pakistan.	2.8	1.8	1.8	3.2	2
4	Full interoperability creates challenges for the business models of some providers.	2.5	2.4	1.8	1.8	2
5	For greatest efficiency and lowest possible pricing, Pakistan ultimately needs one national switch.	3.0	1.8	2.5	2.8	2
6	Achieving full interoperability of financial instruments is inevitable although it takes time.	3.3	2	1.0	1.7	2

See Annex B for more detail

In this environment, it is appropriate to understand and reassess the drivers and uncertainties which would link the question of interoperability of retail payment systems to the end goals of financial policy, especially financial inclusion.

This report will investigate the definition and measurement of interoperability in more detail, but, as a starting point, we take the definition in the *Glossary of terms used in Payment and Settlement Systems* published by the international standard setting body on payments, the Committee on Payment and Settlement Systems (CPSS):

> *"a situation in which payment instruments belonging to a given scheme may be used in other countries and in systems installed by other schemes. Interoperability requires technical compatibility between systems, but can only take effect where commercial agreements have been concluded between the schemes concerned."*[9]

1.2 Purpose of this report

Against this background, this project was not intended to consider strategies for financial inclusion generally, but rather to focus specifically on how payments interoperability in Pakistan affects the

[9] https://www.bis.org/publ/cpss00b.htm

outcome of financial inclusion. In order to focus the discussion on the issue of scale, we adopt the following as a driving question: *Which pathways to interoperability will result in 100 million people using electronic financial services by 2020?*

We have chosen this number because it is almost four times larger than the current total number of bank accounts, which all stakeholders would agree would be a remarkable positive achievement. It is also akin to the number of mobile subscribers a decade after the launch of mobile services in Pakistan, and it would raise the percentage of adults banked from the current level of below 20% to roughly 70%,[10] an unprecedented increment for financial services in this timeframe. An objective of this magnitude and significance can certainly be inferred from a recent post from PTA Chair Dr Yaseen,[11] which sets out a compelling vision of the possibilities created by mobile connectivity. This view was echoed in a recent speech by the Governor of SBP, in which he expressed confidence that the number of agents in Pakistan would double to 50,000 soon, and said "I strongly believe that where conventional banking has its limitations, the electronic payments and mobile banking products should fill the gap".[12]

Even if the developments in branchless banking to date show promise, achieving a goal of 100 million customers is clearly—and deliberately—an enormous stretch from the reality in 2012. Reaching this target is not the preserve of current branchless banking approaches alone, though they are arguably most important in the next eight years and are the focus of this report. A wider discussion must ultimately include the full range of retail payment functionality for required in the future, such as supporting nascent electronic commerce.

It is through the lens of interoperability that we consider different answers to the question of how to reach a state in which 100 million adults use electronic accounts. Our goal is to facilitate ambitious thinking among the stakeholders who are, together, capable of realizing this vision.

This report draws on in-person interviews with a diverse sample of stakeholders from banking, telco, third party entities, and government agencies, conducted during March 2012 (see the list in Annex A), and a workshop with SBP and PTA in May 2012 at which initial findings were discussed. The report draws on our team's range of experiences with financially inclusive retail banking abroad. Where they can illuminate the options faced by stakeholders in Pakistan, we recount these experiences in text boxes throughout the report.

1.3 Structure of the report

The report in successive sections addresses key questions relating to interoperability. Section 2 addresses the question of 'Why interoperability?' as the basis for taking any policy action. In Section 3, we consider the 'What', wrestling with the diverse understandings of the issue and attempting to apply a clear measurement framework. This framework also enables us to recount and assess the history of ATM interoperability in Pakistan as a clear example of where interoperability has been achieved. Then, Section 4 moves on to consider how particular measures related to interoperability shape the pathways forward to the desired outcomes. Section 5 concludes with implications, especially for policymakers.

[10] 22% is based on estimates of 25 million banked, which may be overstated according to recent World Bank FINDEX findings (2012) that 10% of adults have an account at a formal financial institution. By 2020, the UN Population Division estimates that Pakistan's total population is estimated to be 190 million, and the number of people over 15 years is estimated to be 141 million, hence 100 million is just over 70% .
[11] Available via http://www.yaseen.pk/ict.asp
[12] Keynote address at the Fifth International Conference on Mobile Banking, Karachi, 15 March 2012

2. WHY INTEROPERABILITY?

2.1 Conventional policy objectives

Despite its centrality to platform success, interoperability is not a goal unto itself. Instead, it is best considered as a tool to achieve broader social, economic, and market goals.

Intermediate policy objectives for which interoperability is a potential lever are listed in Table 2 below. We understand that policymakers share all of these direct objectives in Pakistan today.

Table 2: The policy objectives advanced by retail interoperability

	Intermediate Objectives		
	Objective	**How interoperability helps to achieve this**	**Potential indicators of objective being achieved**
1	Productive efficiency	By reducing the need for duplicate devices (POS or ATM) or for multiple relationships to be negotiated with merchants and site owners, interoperability can reduce the overall unit operating cost per electronic transaction and increase the utilization of devices. If this efficiency is translated into end user pricing of services, this may increase usage of the system.	• Average cost per transaction reduced
2	Greater customer value through enhanced functionality	As the number of instances in which users can potentially transact increases, the transaction platform and instruments grow more useful to customers through positive externalities. These positive externalities are also known as network effects.	• Changes to account-based electronic transaction volumes per capita
3	Greater customer value through convenience	By increasing the number of places at which customers can transact, the transaction costs of customers to access suitable infrastructure are reduced.	• Accessible number of devices per capita increases
4	Dynamic efficiency	By allowing financial institutions to specialize in issuing or acquiring, specialized business models may develop, with economies of scale and scope which may compete in new ways and for new customer groups in ways which expand the markets	• The number of new players with competitive offerings increases

Even if all of these intermediate objectives are desirable, it is important to prioritize among them since there may be trade-offs among the objectives in the pursuit of interoperability. For example,

- A given interoperability standard may lock in a more expensive technology that impedes the dynamic efficiency of market development
- Interoperability could lead to enhanced competition and customer convenience in already served market niches without generally increasing financial inclusion
- A high degree of payment systems interconnection may be achieved and maintained without necessarily increased competition.

South Africa's experience with interoperability illustrates how trade-offs may pit objectives against each other. South Africa achieved a high degree of bank card and EFT interoperability of its retail payment systems relatively early on by consolidating domestic switching through one national switch owned by the banks. However, in 2008, a government Commission of Enquiry into Banking Charges found

substantial grounds for concern about the high level of not-on-us transaction fees and about the manner in which customer-facing transactions were priced and interchange set. This case is presented in Box A.

The intermediate objectives outlined in Table 2 usually exist in the context of wider societal goals. Two such goals already exist in different forms in Pakistan: increasing financial inclusion, linked to growth and social objectives, and reducing the use of cash, at least for government payments as a way of reducing waste and loss which can extend the reach of social programs such as the Benazir Income Support Program. These goals are in fact linked, and may be mutually reinforcing. Reducing the use of cash requires that more people have access to formal, electronic financial instruments; equally, high levels of financial inclusion are much more difficult to achieve in a cash-dependent financial system, since of the costs of carrying and managing cash are likely to make formal transactions unaffordable.

Interoperability alone will not yield increased financial inclusion. Effective interconnection, which we describe more fully in Section 3, is likely a *necessary* input for full financial inclusion, although, alone, it is not *sufficient* to realise financial inclusion. Financial inclusion arises from interconnected, affordable services that meet real consumer needs. Therefore, inclusion requires strong pricing incentives, product clarity, and a motivated user base.

Box A: South Africa: Interoperability to what end?

South Africa reports a high level of interoperability of both its ATM and POS systems.[13] Indeed, any debit card of an association member can be used at the ATM or POS of any other member, as all issuers and acquirers are part of an automated clearing house. Yet interoperability in SA has not necessarily yielded substantial competitive pressures nor improved financial inclusion.

ATM card interoperability evolved soon after ATMs were first introduced to SA in the early 1980s, through two competing bank-based networks being launched —Multinet and SASwitch—by different groups of banks in 1985. Key members of the first network, which involved bilateral agreements, soon defected to the more efficient central hub model of SASwitch which became the dominant model connecting all ATMs, all of which, whether bank-owned or not, had to be bank-sponsored into the relevant payment clearing house. SASwitch was eventually absorbed into BankservAfrica, the bank-owned operator of the national switch. The practice started early, with the ATM-owning acquiring bank charging a carriage fee—essentially reverse interchange—to the issuer to compensate for its services. The issuer would then recover this fee through another bank ATM charge which would include a so-called 'SASwitch fee' to cover this component, although the amount charged to the customer could vary considerably by bank. This agreement on carriage fees was a key part of the commercial agreements giving effect to ATM interoperability, which was technically provided through the central switch. The carriage fee, which had evolved from a simple fixed fee, changed to a partly fixed and partly *ad valorem* charge, depending on size of withdrawal. This variable fee was initially set multilaterally by banks, but, after competition concerns were raised, the banks claimed to move to bilateral negotiation of the fee. In a country in which ATM ownership and account issuance is dominated by four large banks, total off-us transactions has averaged around 22% for these banks.

A Banking Commission of Enquiry was appointed by the Competition Commission in 2006 to investigate concerns about competition issues in the retail banking sector which touched prominently on payment-related issues, including the fees and charges levied by the banking system for use of payment cards. In the technical report published by the Commission in 2008,[14] the Enquiry panel considered a full range of issues and evidence which had been presented. The Commission devoted a chapter of its findings to the issue of ATM fees and charges. The

[13] For example, see South Africa's self-assessments of interoperability in the World Bank's 2008 and 2010 Global Payment Systems Surveys.
[14] Available via http://www.compcom.co.za/enquiry-in-to-banking/

Commission found evidence that the carriage fee had remained at a uniform level for a long time and raised concerns about the way in which it was set. Specifically, the Commission was concerned that the off-us fees were set to discourage off us usage of ATMs, which then enabled banks to charge more also for on-us transactions than they otherwise would, were pricing of off-us more competitive and permissive of more options.

The Commission concluded (p.182) that: "In terms of cost and risk sharing and enhancing one's competitive offering, each of the banks has an incentive to share infrastructure and participate in a network arrangement…However, the continued carriage arrangements and the indirect pricing to consumers raise a number of competitive concerns."

In short, interoperability has been achieved in South Africa, but, potentially, at the cost of increased competition, lower fees, and whatever resultant improvements to financial inclusion this might have yielded. The Commission recommended the consideration of direct charging for ATMs as a more equitable approach. This, together with the Commission's other recommendations, have yet to be agreed and implemented by the regulators responsible for oversight.

In 2011, the South African Reserve Bank (SARB) which is the payment system overseer published a guidance paper on interoperability[15]. In this, the SARB affirms its general goal of interoperability but recognizes that there may be trade-offs between interoperability and innovation; and states that it will not require innovative solutions to interoperate from the outset.

2.2 A vision of an 'inclusive cash lite' world marshals interoperability for financial inclusion

Because interoperability is not itself an end-goal, it belongs in the category of policy instruments and market approaches that require careful sequencing and prioritization to achieve a clear end-vision laid out by policymakers.

Combining the already stated goals of financial inclusion with reducing the use of cash for government payments, one possible vision for Pakistan is that of an 'inclusive cash lite' society.[16] The inclusive cash lite vision is characterized by:

1) full financial inclusion, aiming ultimately for all adults to have an electronic store of value, and
2) greater efficiency through electronic transactions, reducing the use of cash from a predominant usage across many categories of payment to a state where cash is used as a residual so that cheaper, more efficient electronic transfers are common even for person-to-person transfers.

Note that 'cash lite' is not the same as 'cashless': no society has achieved this end, although some have tried and failed.[17] The costs involved in driving cash out altogether are extremely high, compared with displacing it to the margins of society. In some developed countries today, cash is no longer the most-used payment instrument because electronic acceptance, largely through debit cards, for purchase (P2B) is extremely high. In developing countries like Kenya, two-thirds of adults already report using mobile phones to make convenient interpersonal (P2P) electronic transfers.

[15] Available via http://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/PP2011_01.pdf

[16] For more of the motivation behind this vision, see the CGAP blog by Mas and Porteous (2012) wherein we use the term "LiFi" to represent the inclusive cash lite vision available via http://technology.cgap.org/2012/01/11/a-lifi-world/; or the blog "Going Digital" by Rodger Voorhies of Gates Foundation, available via http://blogs.worldbank.org/psd/going-digital

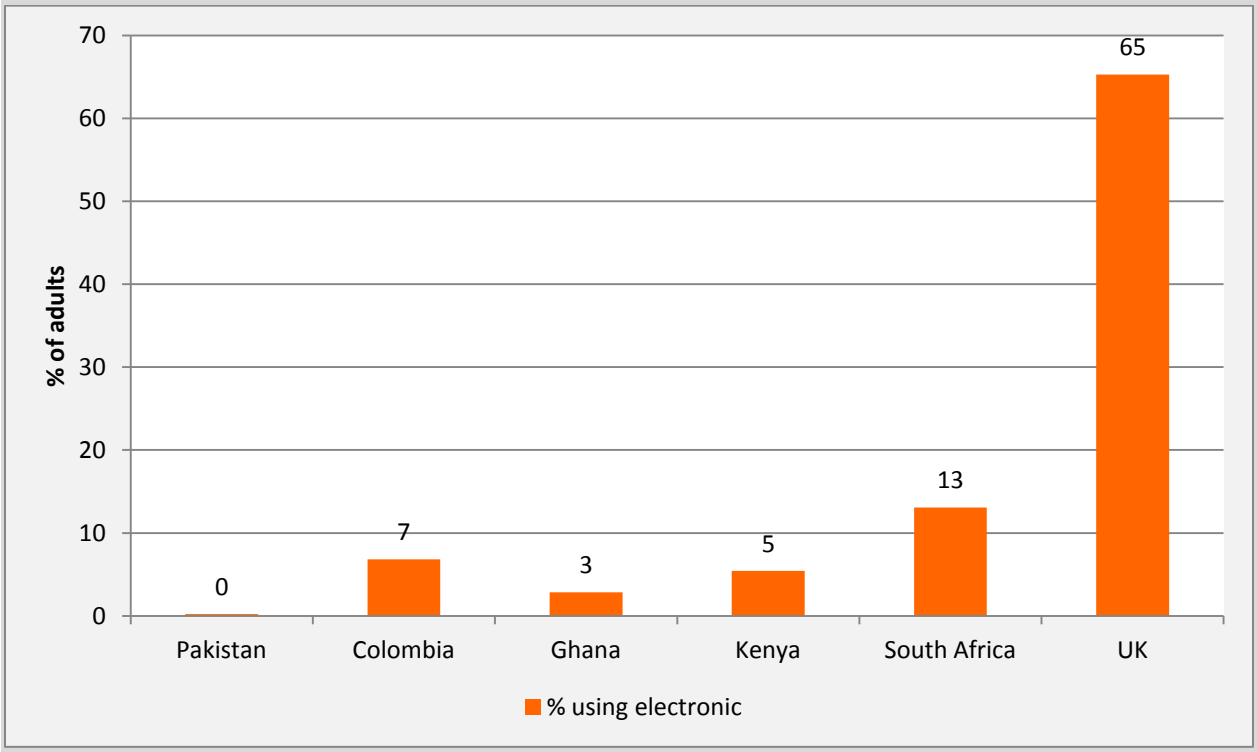
[17] Mas & Rotman (2008) "Going cashless at the point of sale" CGAP Focus Note available via http://www.cgap.org/p/site/c/template.rc/1.9.7885/

Quite apart from the strong inclusive dimension, the 'cash lite' aspect is also highly relevant to the driving question stated above, since 100 million people cannot be served effectively using conventional banking approaches or with heavy reliance on cash. The cost of cash handling transactions, such as teller transactions, may be as much as twenty to thirty times higher for banks than purely electronic transactions, such as mobile or internet transfers. A heavy reliance on the need for cash deposits and withdrawals likely makes the service unaffordable to providers and clients alike.[18]

Box B: Which countries are closest to 'cash lite' today?

CPSS data tracks the number of electronic payments per capita across its member countries. In high-income countries, the number per capita per year has almost doubled to reach 265, or 22 per month. While cash remains important for micro-payments in these countries, surveys of consumer payment choice in the US have found that consumers now on average make more electronic payments per month than paper-based payments (cash or check).[19] This heralds the arrival of 'cash lite' in that cash is displaced as the major payment instrument. This results from an environment in which almost all people have one or more convenient payment instruments (such as debit cards) and in which the acceptance of these instruments, even for small purchases, is widespread, and, coextensively, the use of largely internet based channels for bill payment has soared. In the developing countries, the per capita numbers are far lower, ranging from 5 in India or China to 104 in Brazil, but are rising fast: roughly doubling in four years in Brazil, China and India. Equivalent numbers are not available for Pakistan, but, using the total number of e-banking transactions as a proxy (235 million as per the SBP Payment System Review Q1FY12, 2012), the per capita number would be 1.2 per annum in 2011.

Figure 2: Usage of electronic payments



Source: World Bank, Global Findex 2012

[18] Reference for example forthcoming GAFIS Focus Note 3, www.gatewaytosavings.org

[19] Of course, it is possible that, due to the likelihood of undercounting cash transactions, this may overstate the *degree* of the eclipse of cash, but, even under the most generous assumptions, this statistical uncertainty does not diminish the *secular trend* of increased electronic payments at the expense of cash payments.

There is, unfortunately, little publicly available research in Pakistan at present about general patterns of payments usage among low-income customers. There is also little basis for accurate market sizing of the sort which has been performed in certain other markets.[20] Finally, there is also no available research in Pakistan—and little elsewhere—on the elasticity of demand for payments (e.g., how much a price reduction of e-payments would cause a switch in payment behaviour for existing payments, or stimulate new payments which were not possible before). Collecting this type of information is costly and requires care, but doing so may have great value in the context of undergirding assumptions of business plans and of any national strategy (see Section 5).

In the past year, the SBP has commissioned and disseminated some research on specific categories of customer, such as recipients of social transfer schemes,[21] and more research of this category is underway. Though G2P schemes like BISP are growing, recipients represent a minority of the millions of new customers to be acquired; however, because government has an incentive to pay them in a cost-effective manner, this group, like salaried people, is being rapidly converted to electronic payments in Pakistan, as in other parts of the world.[22]

Achieving cash lite requires resolution of a paradox

To reach a cash lite future, there is a key dilemma to resolve: in order to reduce reliance on cash, it is necessary first to deploy pervasive 'bridges to cash', such as bank branches or agents, so that people can access cash easily and, importantly, exchange cash for electronic money. Without these 'bridges' or touchpoints, people may not trust electronic value, and, even if they do, they will have no easy way of entering the electronic world. Thus, bridges to cash are necessary to harness the demand-side network effects of electronic money. There is therefore a need for a major build-out of issuance (electronic bank accounts) and in cash handling infrastructure (branches, ATMs, and agents).

The need for building out this customer acquisition and service infrastructure is especially pronounced in Pakistan, as it lags other countries on measures of ATMs and agents. Table 3 below shows Pakistan's relative gap against a cross-section of low income (Kenya) and middle income (Colombia, Brazil, South Africa) countries, most of which embarked on the process of allowing agents and mobile money in different forms at a similar time to Pakistan.[23] Brazil started the process of enabling bank agents earlier—effectively from 1999—and linked agent network growth to the rollout of a large national cash transfer (G2P) scheme which helped make the business case. Today, Brazil has a much higher number of touchpoints per capita, although most are non-cash handling points of sale for purchase only.

Table 3: Comparing cash handling touchpoints across countries: Branches, ATMs and agents

Country	Pakistan	Brazil	Colombia	Kenya	South Africa
GNI pc US$	$1,050	$9,390	$5,510	$790	$6,090
Per 100,000 adults:					
Bank branches	8.6	14.0	13.7	4.6	17.9
ATMs	4.6	112.8	28.1	8.5	66.6
Agents*	20.1	104.5	61.2	37.8	22.9
POS	33.0	2,419.0	419.4	82.7	783.9

[20] See example of market sizing in Philippines (2010) via http://www.bankablefrontier.com/assets/pdfs/BMGF.PDP-FinalReport-dec2010.pdf.
[21] See www.sbp.org.pk
[22] See the recent CGAP Focus Note on the experience of four countries with large cash transfer schemes which have all 'gone electronic'.
[23] The Central Bank of Kenya allowed the launch of the non-bank led M-Pesa model in 2007; Colombia adopted regulations allowing banks to appoint agents for deposits and withdrawals in 2006; while Pakistan launched its enabling Branchless Banking Guidelines in 2008.

TOTAL	66.3	2,650.3	522.5	133.5	891.3
Total number cash in and out	28.7	180.0	103.0	111.0	112.2

Sources: GNI pc: WDI 2010; Measures of touchpoints come from a variety of courses, mostly published by financial authorities for each country for most recent year (2011) or in case of Colombia, WB GPSS number of ATMs and POS for 2009 plus agent data for 2011 (Banca de las Oportunidades).
*: note that not all agents, especially in Brazil are cash handling, nor can ATMs accept deposits in many places. Hence the cash in *and* out lists only those which can do both.

Once a critical mass of people begins to transact electronically, the need for cash handling infrastructure diminishes. The revenues to agents and owners of cash acquiring infrastructure per point will decline accordingly. This means that achieving inclusive cash lite requires business models that allow the large-scale deployment of agent and ATM networks which handle cash in the short- to medium-run, knowing that, in the long-run, volumes through such networks will decline.[24]

2.3 Scaling the size of the investment in Pakistan to achieve the outcome

The driving question proposed at the outset asked how payments interoperability would help to reach a total of 100 million adults (of whom at least 75 million would be new account holders) with formal financial services by 2020.

Calculations in Annex D provide some sense of the magnitude of meeting this challenge. First, financial service providers must be willing to spend some $375 million, based on estimated issuance costs including the commissions to agents or the costs of own staff, verification of identity with NADRA and entering the new account on the banking platform for a card-less basic account.

Second, to service this client base will require substantial expansion of the banking infrastructure, in particular the places at which customers can deposit or withdraw from their accounts. If Pakistan follows benchmarks of a upper-middle income country, such as Brazil, for the ratios of touchpoints per capita and if the same distribution applies across new branches, ATMs, POS devices and agents,[25] then the country may require financial providers to deploy more than 1 million new units, up from some 74,000 total of branches, agents, POS devices and ATMs today. Using general norms of costs for each type, this would require a collective investment of $5.2 billion. To place this figure in perspective, it is four times the entire profit of the Pakistan banking sector in 2011 and it starts to approach the total of $6.7 billion in capex reported across all Pakistani MNOs to Wireless Intelligence in the five years to 2011.

If the new outlets were primarily mobile-enabled agents, not branches or ATMs which are more expensive, the capex associated with this 'branchless banking' scenario would fall by half to $2.4 billion, although this remains a daunting investment proposition. The problem is compounded if the number of cash handling locations is expected to fall in the long run, as a society converges on the 'inclusive cash lite' outcome.

Not only are these combined issuer and acquirer costs very substantial, but they generally have to be committed upfront, without any certainty of return. Return from transactional accounts is not likely to come mainly from holding the float—even if each new account holds an average balance of

[24] This was the essential dilemma pointed out in the Scenario 4 (MPayZ) in the BB2020 CGAP Focus Note 57 (2009).
[25] Around 1,200 per 100,000 people (not adults as earlier), though POS devices at merchants make up the largest component.

Rps1000/$11,[26] then $830 million in total new deposits will be mobilized, or only 1.2% of the total deposits of the Pakistani banking system in 2011. The new revenue must come either

a) directly, through frequent usage, wherein senders or receivers (such as businesses receiving bill payments) are willing and able to pay for transactions, or
b) indirectly, through the cross-sale of other services, such as credit in the case of banks, or through other valued benefits such as a reduction in pre-paid airtime churn in the case of mobile network operators.

The level of fees which the bulk of new, low-income customers are willing and able to pay is likely to be low. This is illustrated by the fact that the Average Revenue per User (ARPU) on mobile voice subscriptions has declined gradually as penetration has grown downmarket from $3.58 in 2006 to $2.60 per month in 2011.[27] More than 100 million people are willing to pay that amount for voice and SMS services, but ARPU for voice and data users is likely to be much higher than that of mobile money users when schemes are widespread.

Even getting to an active level of monthly usage may be challenging on the client side as well. As Figure 2 showed, usage of electronic payments starts from a low level in Pakistan, and the time required for uptake to surge is uncertain. What is certain is that considerable marketing expenditure will be necessary, adding to the upfront cost for providers. If accounts opened do not become active, then the cost of acquisition becomes deadweight loss to the issuer. Recent CGAP research has shown that dormancy is a pervasive problem with mobile money services worldwide, with as many as 92% of new customers inactive after registration, many of them without ever making a transaction.[28]

In short, there are severe business model challenges to reaching this goal and considerable uncertainties on the client side in the current context.

2.4 Interoperability and incentives for providers & clients

How, then, does interoperability affect this picture? Table 4 below lays out the three main channels of effect on the incentives of financial providers and clients, related to the policy goals discussed in Section 2.1.

Table 4: How interoperability affects incentives of providers and customers
(cross referenced to the policy goals in Table 2)

1	Cost reduction for provider (Policy goals 1 & 4: Productive efficiency and Dynamic efficiency)	Interoperability may reduce the upfront costs which each provider must incur by allowing access to infrastructure built by others, and by creating economies of scale in the production of services which also eliminate the need for multiple interfaces between providers. However, as a result, it may also undermine incentives to invest in new infrastructure.
2	Fee reduction for consumer (Policy goal 4: Dynamic efficiency)	Cost savings on the supply side will only be passed on to end-customers if there is sustainable competition; interoperability may enable new specialized business models to emerge, or at least reduce the barriers to entry for new providers, increasing contestability, in ways which will cause providers to reduce fees pre-emptively. While this reduction may make the service more

[26] This is higher than the average for basic bank accounts in many countries, but the average is dragged down by very high rates of dormancy with zero0 balance; this assumes active usage.
[27] Wireless Intelligence for Pakistan
[28] Source: http://technology.cgap.org/2012/02/22/how-are-you-using-your-data-cgap-releases-study-on-use-of-data-analytics-to-understand-low-customer-activity/

		affordable and appealing to the customer to use, this corresponds to lower revenue per account for providers. Competition among providers without efficient cost structures can lead to loss for providers.
3	Enhanced value proposition for the customer (Policy goals 2 & 3: Transaction costs; Network externalities)	Network effects in electronic payments mean that the value of any payment scheme to customers will be in some proportion to how many of their current or future social or business network can be paid or can pay them. In this case, incentives may work in the same direction for customers and providers: more customers on the network means more usage by those customers, which should mean more revenue for providers; however, *how* that revenue is split will depend on the patterns of usage for payment instruments—regarding interchange fees for example.

Interoperability may reduce costs for providers if, *inter alia*, it:

- *Enables the exploitation of economies of scale in production*—for example, on equipment which meets a common standard therefore serve a bigger market with larger production runs.
- *Eliminates the need for duplicate investment*—for example, not having to deploy ATMs in the same location as a competitor in ways which reduce the utilization (and, therefore, increase the cost per transaction) of both machines; more accurately, whether interoperability in fact reduces costs for the provider in the long-run will depend on whether the fee paid (carriage fee for ATMs) to another provider for clients to use their device is, in fact, less expensive than deploying owned devices. However, interoperability changes the profile of investment (namely, there is much less upfront), and therefore the risk, at least for entrants who can use incumbents' devices. The logic for incumbents to allow this is, of course, the reverse.
- *Reduces the number of interfaces necessary to conduct payment business*—for example, one central national payment switch means that each financial institution need only implement and maintain one interface, rather than having to pay for multiple interfaces. This is the classic argument for one national switch, but it is counterbalanced somewhat by the risk that, even if efficient at the beginning, one monopoly provider may not maintain dynamic efficiency over time; having some options may be more efficient in the long run.
- *Aggregates demand for services through a central point*—for example, if a group of banks are each buying communication services from MNOs, aggregating their demand through a common hub which connects to all MNOs may enable keener pricing from MNOs, which can be passed on to the banks.

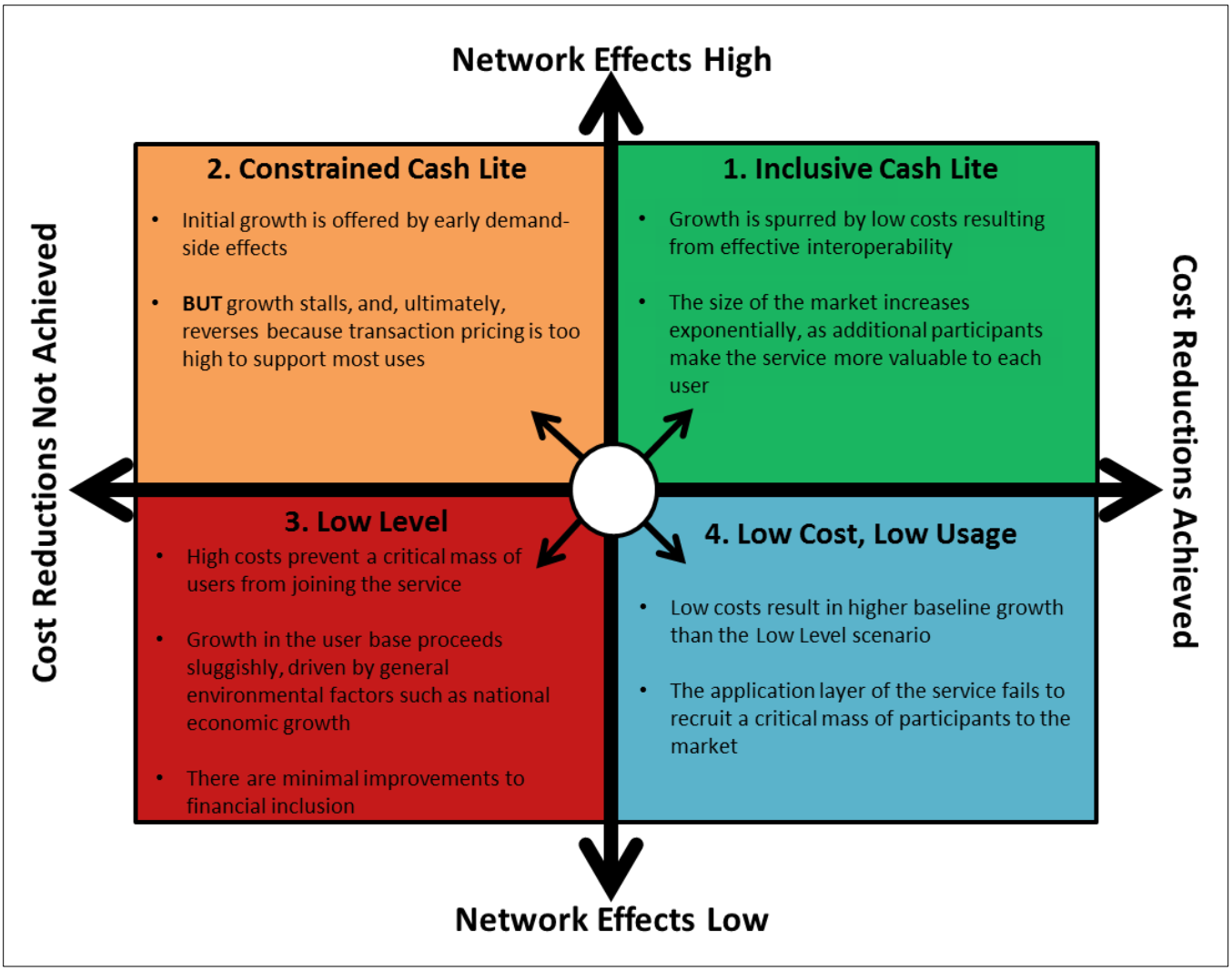
Cost savings will be passed on to consumers in the form of reduced fees as the result of competition. By enabling innovation through the entry of specialized, new business models (which do not need to serve both sides of the market, for example), interoperability can unlock dynamic efficiencies which will make financial services more affordable to consumers over time.

However, to achieve the outcome of 100 million financially included clients, fee reduction is not enough: clients need a strong value proposition to use electronic services. Interoperability harnesses network economies by making an electronic account much more usable and accessible as a payment channel.

The pathways to an inclusive cash lite society therefore depend on how these three factors—cost reduction for providers, price reduction for consumers, and network effects that enhance the customer proposition—interplay over time to reinforce or undermine each other. For the purpose of representation, we simplify the two cost factors into one: sustainable fee reductions resulting from cost

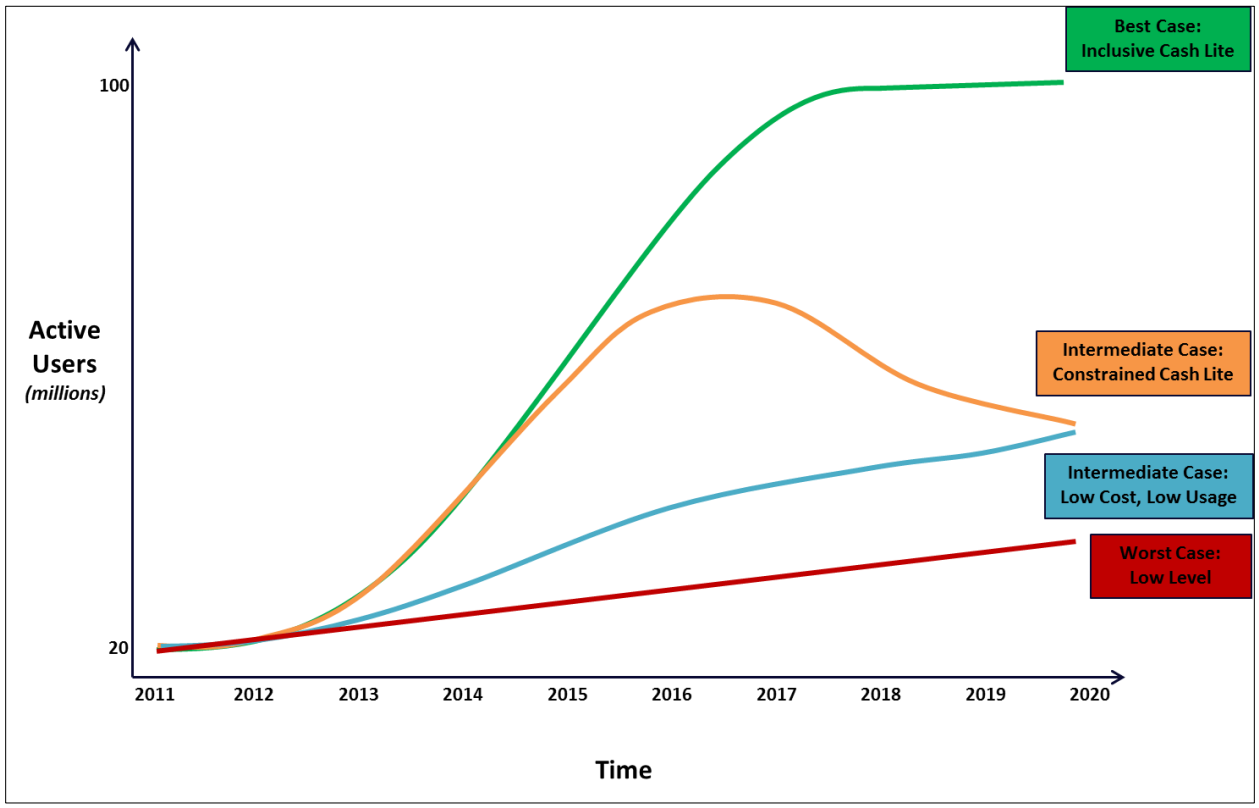
economies passed on to customers. There are at least four possible resulting end games of development, summarized in Figure 3 below, depending on whether network effects are harnessed or not (on the vertical axis) and whether costs are reduced (horizontal axis).

Figure 3: Cost reductions and network effects offer pathways to various end-states for retail payments



Not only will the end outcome differ in each quadrant, but the route to get there will look different. For example, Quadrant 1, in which there are both strong positive network effects and sustainable cost reductions, is the scenario most likely to generate a classical S-curve of adoption with enough velocity to reach the goal of 100 million customers, although the timing is uncertain. The S-shape is generated as adoption accelerates after an initial period due both to lower fees and network effects, as has been witnessed in many mobile voice markets. Figure 4 below stylizes this best case trajectory in green on the basis that it does in fact reach 100 million by 2020.

Figure 4: Pathways to future states of end-states of financial inclusion



Other scenarios are more constrained in their outcomes in terms of the numbers using electronic financial services. The scenario in Quadrant 3, lacking both positive network effects and cost reduction, constitutes the worst case with a low level trajectory with only a moderate upward slope at the underlying trend growth rate of the economy and banking system (which could even turn downward due to exogenous factors unrelated to these factors). This is because neither demand-side network effects nor cost reductions figure significantly in the underlying picture for customers or providers.

Quadrants 2 and 4 capture one, but not both, effects; as a result, they generate different 'intermediate case' trajectories. In the 'constrained cash lite' scenario (#2), network effects achieved through a high degree of interoperability unlock an initial take off in usage as a result of customer interest because of positive externalities hence tracking but providers cannot sustain their fee levels due to their high costs. They either raise fees or withdraw (or do not promote) the service. As a result, the initial surge in uptake is short lived, and a number of customers lose interest as a result, resulting in a decline in numbers even though the number at the end is still higher than in the worst case (#3). In the 'low cost, low usage' scenario (#4), costs are reduced more and faster than in the worst case, and these savings are passed on to customers resulting in higher rate of adoption than in that case; but the small size of the network of potential transacting parties and/or a lack of other product features prevent a rapid rise in service usage—rather a high rate of growth over the period, but without explosive adoption as in #1.

3. UNDERSTANDING AND MEASURING INTEROPERABILITY

Section 2 discussed why interoperability could be marshalled to support the goal of financial inclusion: it can generate cost reductions for providers and customers, and can harness network effects to improve the utility and affordability of services to customers. This section

1) advances a definition of interoperability that can help policymakers assess the state of interoperability within their areas of remit, and
2) applies this definition to the Pakistani context and seeks to understand the history thus far.

The definitions and assessment of interoperability advanced in this Section highlight areas for improved data collection and can help regulators define and monitor more precise objectives in this area.

3.1 Common definitions

The Payment System and EFT Act (2007) and previous regulations of SBP have not yet defined interoperability explicitly. Instead, the SBP Branchless Banking Guidelines of 2008 refer to permissible models of cooperation between banks and MNOs, which include one-to-one, one-to-many, and many-to-many. In a recent speech, the Governor of SBP affirmed that all of these models remain permissible.[29] Of these, one-to-many models permit a form of interoperation inasmuch as clients of a bank can access mobile services, regardless of their mobile operator. Equally, many-to-many models permit clients of multiple banks to interact across the mobile channels of multiple MNOs. SBP acknowledges that these models fall short of the usual model for 'full interoperability' which is often called 'any-to-any', implying that any client of any bank and telco can transfer funds to any other bank client, regardless of the recipient's bank or telco. Nevertheless, SBP recognizes that one-to-many and many-to-many models may serve as stepping stones in the direction of any-to-any models.

In the current draft regulation on 'third-party service providers', *interoperability* is defined as 'a system which enables interconnection among the authorized financial institutions (AFIs), operators, TPSPs and other participants for the provision of mobile/branchless banking services to customers of member AFIs and subscribers of member operators.'

Interconnection is then defined with reference to the PTA Telecommunication Rules of 2000 at (Sec 2(h)): 'the physical and logical connection of two operator's connectable systems thereby allowing customers of one system to connect with customers of the other system, or to access telecommunication services provided from the other system.' While interconnection is a term more commonly found in telecommunications than in financial services (where 'interoperability' is more commonly used as the financial equivalent), this definition clearly identifies the components necessary for interconnection as physical and logical connections between connectable systems. A system must therefore first have the *ability* to connect, then have the *physical interfaces* necessary to do, backed by the *logical interfaces*—including the interconnection agreements which define business rules—to lead to a state in which customers of one service can connect to customers of another service.

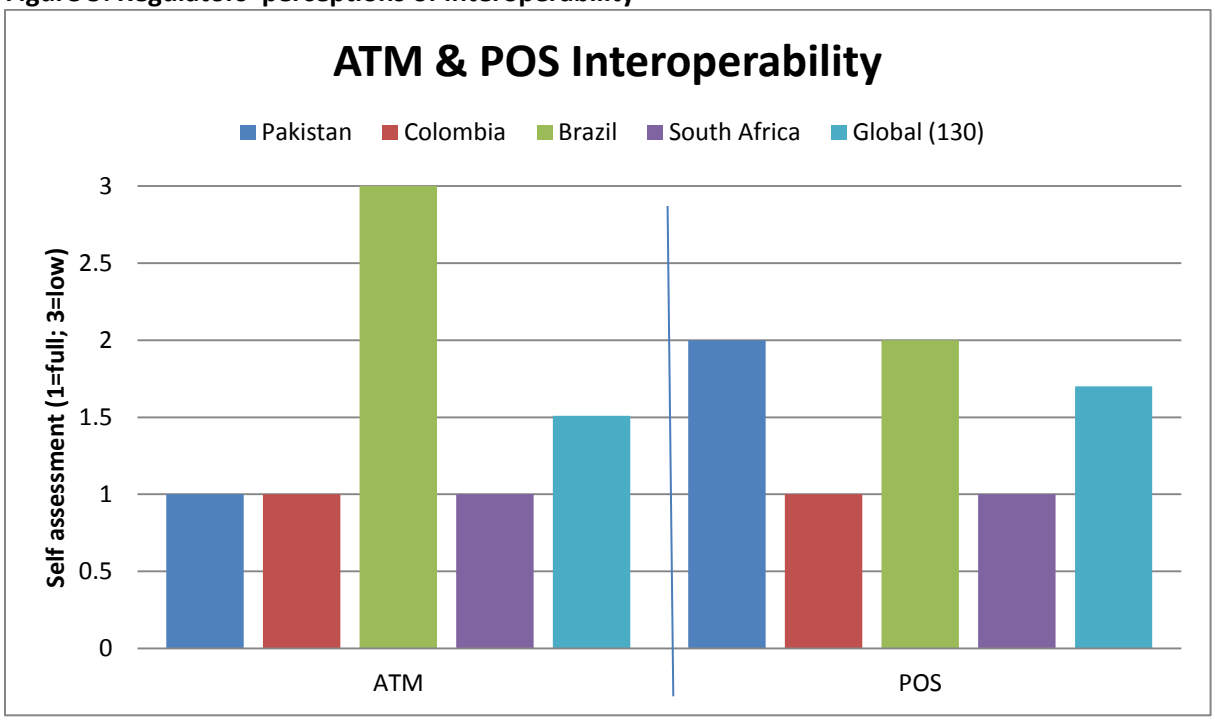
3.2 Measuring interoperability

Financial regulators seldom measure interoperability precisely, in part because it can be hard to do and because there are not yet internationally consistent bases for doing so. Instead, a common approach is to survey perceptions of the degree of interoperability across defined payment systems. For example, the World Bank Global Payment Survey asks regulators to assign a score on a three point scale—from 1

[29] Speech on 15 March 2012

= full interoperability to 3 = limited or no interoperability. The results are shown in Figure 5 below for Pakistan in respect of ATMs and POS compared with other countries. According to this outcome, Pakistan ATM systems are fully interconnected while POS systems are partly interconnected, a view which coincides broadly with views expressed to us by stakeholders.

Figure 5: Regulators' perceptions of interoperability



Note: Global: all 130 countries answering this question in the GPS.
Source: World Bank Global Payment Survey 2010

But what of other transaction types and channels? And, even if the results above are considered broadly 'right', can one measure the degree of interoperability in a more calibrated and less perception-based manner?

To improve information richness and precision, we propose and apply to Pakistan a new approach to measuring interoperability. This approach measures the proportion of eligible accounts which meet a tiered definition of interoperability for each payment instrument. The approach requires definitions of three dimensions.

First, distinguish clearly among the instruments, transaction types, and channels involved and determine a clear use case to examine. The level of interoperability will vary, depending on the:

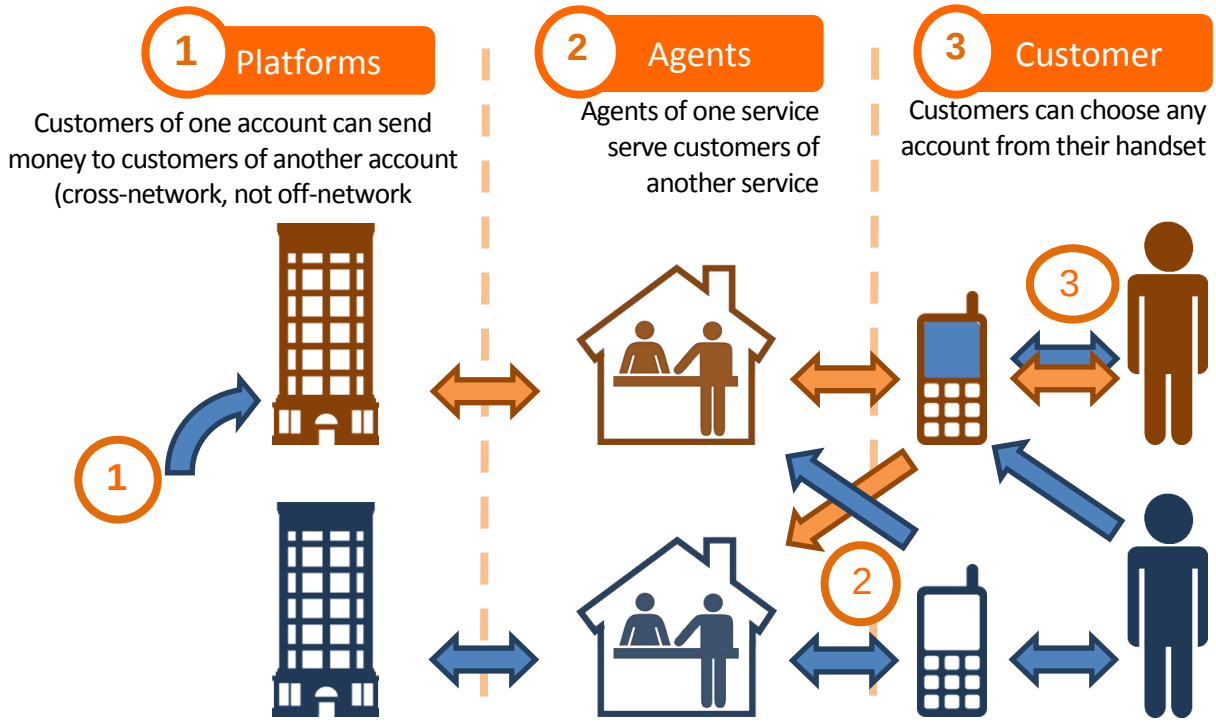
- Accounts to and from which payments may be made (e.g., all bank accounts, card-linked accounts, basic accounts, mobile wallets)
- Payment instruments (and associated transaction type) used to effect a given use case (e.g., cash withdrawal as a specific use case in the category of the card payment instrument)
- Channels used (e.g., ATM or agent)

This precision around the cluster of components forming the interoperability use case is necessary for measurement. As an example, consider the exchange of electronic value in an account for cash. This

outcome can be effected via cash withdrawal using a debit card at an ATM, or it can be effected via a mobile phone-mediated electronic funds transfer to an agent. Even though these two cases share an outcome—cash in hand—they rely on very different payment instruments (the first is a pull transaction from the acquirer, and the second is a credit push transaction from the sender) and use different channels. And the accounts from which the electronic value may come is different in each case. Even varying one component such as the transaction type—for example, to cash deposits at an ATM—may change the measure of interoperability substantially.

This use case framework essentially generalizes the three levels of interoperability suggested by Tarazi and Kumar in a series of CGAP blogs earlier this year,[30] which are summarized in Figure 6 extracted from their post below. These three examples highlight threshold use cases particularly relevant to branchless and mobile banking. 'Platform level connection' refers to a 'pure' electronic funds transfer between banks, regardless of channel used to initiate the transfer. The agent case (Number 2 below) refers essentially to a particular transaction type (cash in and cash out) using a particular channel. The customer level (#3) relates to the particular characteristics of the mobile device as a channel access instrument.

Figure 6: CGAP Interoperability Framework



Source: Michael Tarazi & Kabir Kumar "Interoperability and related issues in branchless banking and mobile money", 9 January 2012

*Second, for the use case selected, define discrete levels at which interoperability can be measured***.** By disaggregating the various levels of interoperability, it is possible to measure the number of accounts

[30] See http://technology.cgap.org/2012/01/09/interoperability-and-related-issues-in-branchless-banking-and-mobile-money/

that correspond to a given level. Table 5 presents a view of interoperability wherein the levels are clearly articulated, and, importantly, additive: higher levels require the lower levels to be in place. This process emphasizes the incremental nature of interoperability. For example, if the banking system of a financial institution is not capable of functioning in a connected way (Level 1), then no matter what types of agreements are in place (Level 4), there can be no effective platform interoperability. Or consider the example of a payment system in which Level 4 interoperability has been achieved for all qualifying accounts; irrespective of business rule agreement, the effective level of interoperability will be very low if the cost of interconnection faced by users exceeds a defined norm. While payment regulators have generally not set standards for inclusive pricing, telco regulators have more commonly considered the cost-to-customer dimension as part of their definitions of universal service coverage.

Table 5: Defining five levels of interoperability of a defined payment instrument

Level	Name	Definition	Requirements
1	Theoretically interoperable	System of one participant is capable of connecting to another	Typically, the issuer must have a core electronic banking system
2	Technically interoperable	Standardized interfaces exist for trustworthy message exchange between parties	Standardized interfaces must be physically in place for exchange
3	Functionally interoperable	Interfaces and systems function to required robustness	The systems must actually be able to connect at determined specifications for instrument (uptime, response time, etc.)
4	Interconnected	Business rules exist which enable exchange of value between participants	The agreements must be in place defining fees, rules and risks of the exchange
5	Effectively interconnected	Interconnection achieves intended objectives (e.g., is not impeded by high fees)	To define effective requires that some norms be set. For example: for end user cost for a use case in order to achieve a specified goal (such as greater inclusion)

Third, define the scope of the interoperability measure—this will form the ratio's denominator. Measurements of interoperability run up against the question, 'Relative to what?' We address this question by identifying a reference category populated with the number of qualifying accounts over which the measure will be applied. Moreover, by adjusting the reference category we are able to address different questions about the scope of interoperability. There are three core ways to define the scope of an interoperability measure. It can be based on the:

a) *Universe of adults* (120 million), so that the proportion of interoperable accounts is relative to the absolute maximum. This method provides the broadest scope and will assess exclusion in a society in which most adults do not have accounts, provided that the instrument is meant to be universal.
b) *Total number of accounts at authorized financial institutions* (25 million), so that the proportion of interoperable accounts is defined with reference to extant accounts. This method separates the assessment of financial exclusion from the assessment of interoperability by considering only the population of accounts that are currently open. In practice, this measure would help shed light on whether interoperability is depressed by characteristics of the accounts themselves. For example, despite being tallied as an account, a bank account without a linked ATM card is inaccessible at an ATM; therefore, it is not interoperable.

c) *Number of accounts qualifying for the particular instrument*, in order to provide a narrow measure of interoperability across platforms that offer the same instrument. This method assesses interoperability without reference to either financial exclusion or the pervasiveness of a given instrument. For example, when measuring card interoperability, only accounts with linked cards would be counted when determining the denominator. Although this is the most direct measure, it may overstate the situation by losing track of the forest for the trees; if only 10% of people or one-third of bank accounts have associated cards, it may be less meaningful to state that the accounts of this tiny minority are interoperable.

These three steps enable us to define with greater precision what *full payment instrument interoperability* means at a *given level of interoperability* for a *stated use case.* If the SBP were to collect the inputs for this measure on a regular basis, the proportion of interoperable accounts could then be tracked to indicate trend over time.

3.3 Applied to Pakistan

We demonstrate the application of this measure to Pakistan with respect to three use cases which are critical to the achievement of the inclusive cash lite vision and are summarized in Table 6 below. Note that use cases 2 and 3 correspond essentially to more defined versions of the agent-level and platform level interoperability in the CGAP framework discussed earlier.

Table 6: Interoperability use cases considered

		Use cases		
		1. ATM withdrawals	**2. Cash-in and out at agent**	**3. IBFT**
A	Store of value (from which accounts)	Card linked bank accounts	Mobile wallets	Any bank account
B1	Payment instrument category (how value is transferred)	Payment card	Credit transfer	Credit transfer
B2	Transaction type (application of discrete rules to instrument)	Cash withdrawal	Cash in/out	Real time electronic transfer
C	Channels used (to access instrument)	ATM	Agent	Mobile, PC, ATM

Note that the final production of these measures requires accurate data reporting by banks which would have to be collated by the State Bank. Consequently, in order to arrive at the initial indications in Table 7, we have used available data and made assumptions shown in Annex C. In part, this exercise illustrates the value of collecting the required data and undertaking the measurements over time.

Table 7: Measuring interoperability for three use cases in Pakistan

Layer	**Definition**	**% of accounts qualifying at each layer**		
		ATM withdrawals	**Cash-in and out at agent**	**IBFT**
1	Theoretically interoperable	100%	100%	[all accounts at online branches only]
2	Technically interoperable	100%	0%	46%
3	Functionally interoperable	100%	0%	46%

4	Interconnected	100%	0%	[accounts at the 20 1LINK banks that have signed IBFT agreement]
5	Effectively interconnected	100%	0%	[as for 4, provided pricing is appropriate and not an impediment to service usage]
	Total eligible accounts for instrument (Denominator definition C from Section 3.2)	15,327,626	929,184	28,700,000

Source: SBP numbers; see workings for each in Annex C. Note where numbers are not stated, they are not presently available.

The outcome of these measures is to confirm the view that the degree of interoperability card-based ATM withdrawals is high at all levels (even effective level #5 since the cost to customers is low in absolute and relative terms and there are few impediments to ATM withdrawals). Note that this would be different if we considered ATM deposits as the transaction type, underling the importance of clear definition of what is being measured.

Interconnection at Level 4 for IBFT applies only to all those accounts at 1LINK members which have signed the IBFT agreement (an unknown subset of the 12.9m accounts at all 1LINK member banks, although the majority); however, all card-linked accounts at 1LINK member banks would qualify at Levels 2 and 3, constituting 46% of the total number of bank accounts in existence which is the chosen denominator. There is no basis yet to set norms by which to judge effective interconnection for IBFT. Of course, the bigger issue for all measures remains that the eligible number used in the denominator above remains small relative to the inclusion goal.

Finally, it is important to emphasize that the low current level of interoperability measured for agent-based transactions is not, per se, cause for concern. Since these use cases were all introduced at different times, one would expect differences in the levels; hence, timing and market development must be taken into account in interpreting the measure. Even allowing time for interoperability to evolve, a higher interoperability measure is not necessarily an unalloyed 'good thing' in itself, as the earlier section and the example of South Africa highlighted. Rather, the appropriate level must be judged against what is necessary to achieve defined objectives.

3.4 Understanding the past: how did interoperability evolve in Pakistan?

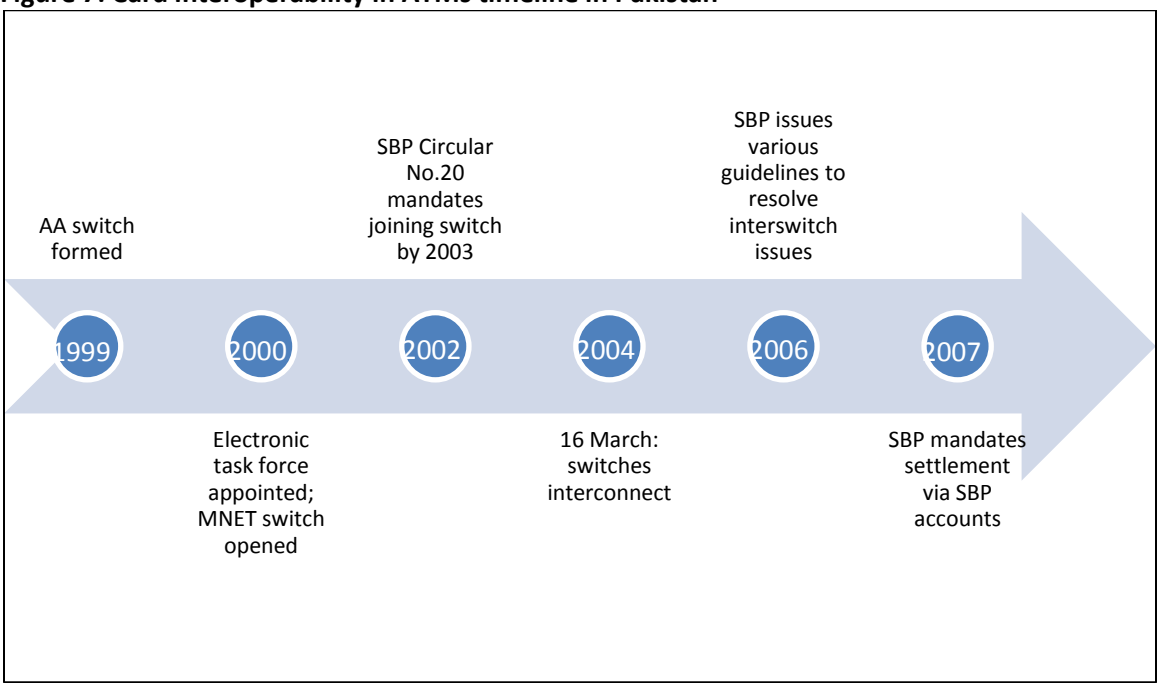
Given the high levels of interoperability for card-based ATM transactions and IBFT, it is worthwhile to investigate the origins of their interoperability for lessons on how to promote the interoperability of other instruments. The evolution of interoperability in card-based ATM transactions and interbank funds transfers presents two strikingly different stories, and we review them below.

ATM interoperability: A success of regulatory intervention

Interoperability of ATM cards dates back to a mandate issued by the SBP in 2002, as the timeline in Figure 7 below. SBP Circular 20 required all banks to connect to one of the two locally-owned ATM switches, 1LINK (originally ABN AMRO shared ATM switch) and MNET, by 2003. Both of these switches were established around 2000 as a means of sharing ATMs among a small consortia of banks. As a part of its interoperability mandate, SBP also required the two switches to interconnect to each other. The connection of the two switches was effected in 2004, but there were several years of operational

difficulties that followed. Such difficulties illustrate that the technical aspects of payment instrument interoperability cannot be overlooked even if it is promoted using common messaging standards. The original mandate to interconnect followed the recommendations of an Electronic Clearing Task Force appointed by the SBP, and the Task Force drew its membership from industry, the State Bank, and the Ministry of Science and Technology. This Task Force had a broader remit: considering how to upgrade the IT backbone of the banking sector, and recommending that banks move towards on-line core banking systems as a pre-requisite for interconnection.

Figure 7: Card interoperability in ATMs timeline in Pakistan

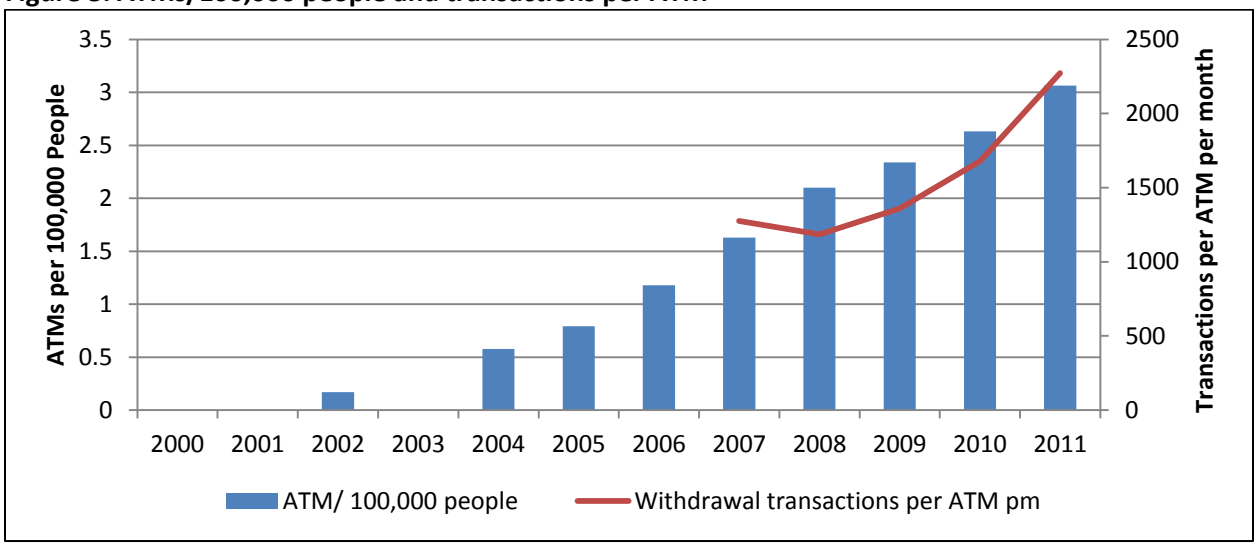


SBP's 2002 mandate came early in the deployment of ATMs, in that there were only 255 ATMs in the entire country at that time. However, while the issued card base was correspondingly low, there were already millions of bank accounts in existence. These customers could only be serviced in branches, and this constraint exerted considerable pressure on banks to offer more convenient and cheaper channels to service their existing issued customer base.

It was at the time of mandated interconnection that the fee structure for ATM balance enquiries and withdrawals was established based on prevailing charges and continues to this day: no charge for on-us services, and a flat fee of Rs15 for off-us withdrawals. 1LINK member banks split this fee between the acquirer (Rs11.61), the switch (Rs2) and the processor (ABN AMRO, subsequently Faysal Bank, Rs1.39. MNET banks also assess the Rs15 fee for off-us withdrawals, but Rs11 is paid to the acquirer and Rs4 is paid to the switch for off-us intra-switch transactions, and, for off-us inter-switch transactions, the Rs15 is divided among the acquirer (Rs11), the switch (Rs2), and the processing bank (Rs2). The Rs15 fee has not been adjusted since then, although there have been some indications that banks may have wished to increase the fee, since it barely covers costs even for the largest acquirers. The practice by which this fee was effectively set at a uniform level across the banking sector has recently been subject to challenge by the Competition Commission of Pakistan.

These actions laid the basis for the high measure of effective interoperability for card-mediated withdrawals from ATMs discussed in Section 3.3. Ten years after the initial interconnection mandate was issued, it is appropriate to ask about the policy's outcomes. These can be considered by various measures. First, the number of ATMs per capita has risen sharply over time as shown in Figure 8 below. The increase in ATM prevalence suggests that interconnection did not undermine absolute incentives to deploy new ATMs. However, the number of ATMs and POS per capita in Pakistan are below the level which would be expected for a country of its level of income, which implies that the growth may not have been as rapid as it could have been. Second, transactions per ATM have risen, suggesting that utilisation of ATMs has improved. This, too, affects incentives for ATM acquirers, for if utilisation had fallen, it could point to inadequate incentives on the issuing side of the market.

Figure 8: ATMs/100,000 people and transactions per ATM

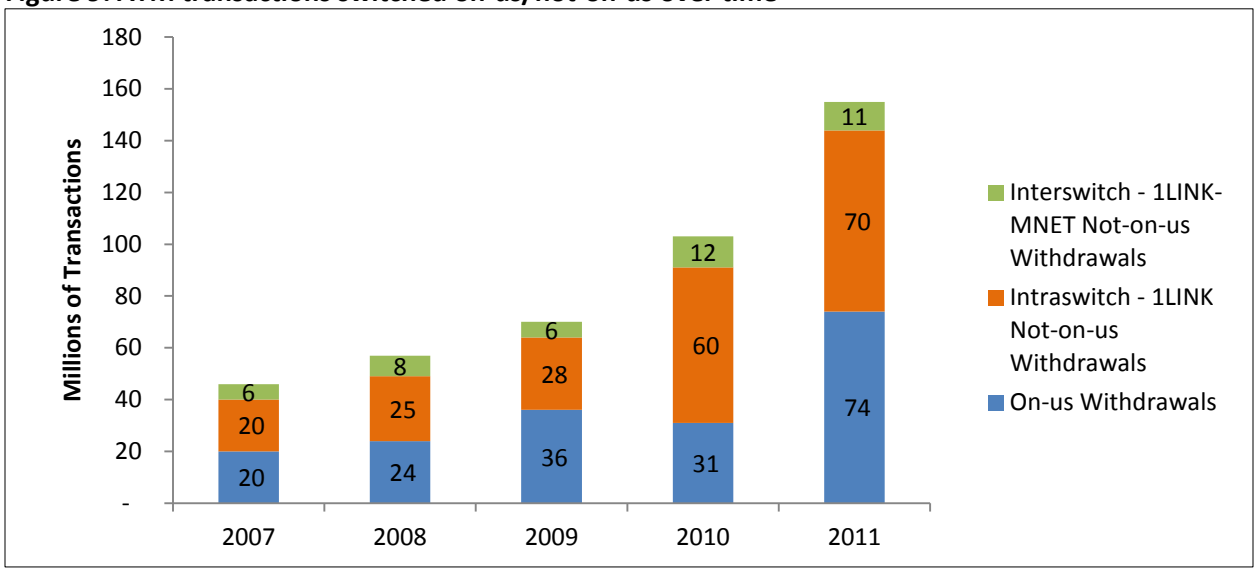


Sources: ATMs: 1LINK data; Population: WDI

Finally, in terms of outcomes, Figure 9 below shows the absolute number of ATM transactions and the breakdown of not-on-us transactions. The proportion of not-on-us (area other than blue) has remained consistently high—around 40%. By comparison, the similar figure in South Africa, a country with high level of functional interoperability of cards in ATMs, is only 22%;[31] in Mexico it is 11%. These disparities suggest that bank customers in Pakistan with cards do indeed take advantage of the interoperability of their cards to perform transactions.

[31] Source: Banking Inquiry Report 2008, SA Competition Commission

Figure 9: ATM transactions switched on-us/not-on-us over time



Sources: PSD SBP; 1LINK, MNET's annual December reports

In general, these indicators suggest that the interoperability mandate for ATM cards has not stifled growth, although the prolonged low level of fees may have reduced incentives to deploy further: Table 8 shows how low the not on us ATM fee is relative to South Africa and Kenya, but the level of ATMs per capita is also much lower (half that of Kenya, for example) as shown in Table 2. Clearly, the low level of this fee has encouraged much higher levels of usage. Also, the uniformity of the fee may have given greater certainty to consumers, possibly encouraging greater usage of ATMs in general than if a variable price regime were in place.

Interestingly, it is this uniform end-pricing regime which has been subject to question by the Competition Commission: not the level, which the Commission acknowledges to be low relative to cost numbers obtained from banks, but rather the manner of setting the end-user price in a way which prejudices competition.[32] If this challenge is upheld, the uniform pricing of ATM withdrawals may end, allowing a range of differentiated pricing. It will still be necessary to agree on a method for charging interchange for not-on-us ATM transactions, which industry bodies and regulators in many jurisdictions have struggled with how to do (see Box C below). Certainly, as Table 8 shows, the pricing of interchange and switch has been low relative to some international precedents, although many factors contribute to these differential pricing outcomes.

Box C: Interchange: necessary, but how best to set the level?

The Commission of Inquiry into bank charges in South Africa considered in detail the issue of how interchange pricing is determined across various payment streams as well (ATM, POS, and other instruments). Considering international precedent and the economic rationale, the Commission opined that while interchange had been internationally established as a legitimate fee in a two-sided market, the process by which it is established was subject to question and to the standard tests of competition law and policy: "it is important to ensure that the theoretical case for interchange does not become a smokescreen for an impermissible exercise of market power, whether by schemes or participating institutions" (Section 6.6.10).

[32] See announcement re search and seizure at Bankers Association: http://www.cc.gov.pk/index.php?option=com_content&view=article&id=231&Itemid=86

The local Banking Association made a submission to the Competition Commission on the issue, laying out the types of possible approaches which banks in South Africa had considered, and in some cases used, for interchange determination. These included:

- Multi-lateral setting:

--Pure: negotiations involving all participants;

--Using multi-third parties: a number of third parties such as the card associations conduct their own interchange studies and each sets interchange independently;

--Using single third party: an independent agency is appointed to cover all payment streams: in 2003, the banks commissioned an independent consultancy (EDC) to conduct a cost study, which considered free funding periods, guarantee costs, processing costs which led to a revision of the costs.

- Bilateral negotiations: covering all participants and payment streams would mean 2400 agreements
- Independent commercial structure: an independent body would set interchange
- Board of trustees: an independent group of people could be appointed using PASA structures to consider this.

Since each approach had issues and each could be subject to challenge, the banking industry asked for clarity as to which would be allowed. The Commission eventually recommended "an independent, objective and transparent regulatory process for determining interchange in the payment card and other relevant payment instrument streams be implemented as soon as practicable."

In 2011, the National Payment System Department of the central bank, which had been reluctant to get involved in price setting, finally stepped in, by commissioning an Interchange Determination Project[33] to consider the need and if so the approach to setting interchange. In terms of this project, the regulator would first gather independent technical evidence before embarking on a detailed process of price setting, which is likely to happen in 2012.

Table 8: Comparing costs of instruments

		Pakistan	Kenya	South Africa
Card withdrawals in ATMs On us	$	Free	0.38	0.44
			Varies by bank	Varies by bank (can be bundled)
ATM withdrawal average size	$	102.5	0.00	47.50
Not on us				
Average cost to client	$	0.17	0.88	0.88
Interchange paid to ATM owner	$	0.13	0.44	0.63
Switch fee	$	0.02	0.18	0.02
% not on us		40%	32%	22%
Real time clearing across banks – IBFT				
Average fee to sender	$	0.33	Not available	3.75
Interchange paid to receiver	$	0.13	Not available	1.25
Switch fee	$	0.02	Not available	0.02
Local currency units converted to USD at:	Mar-12	90	80	8

[33] http://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/IDP/Pages/Default.aspx

Dates		2011	2010	Various
Sources of financial data		SBP/ 1LINK	CBK data	BFA (2011)

These outcomes of ATM card interoperability in Pakistan square with the general view which we have heard from stakeholders: that in general, the ATM interoperability mandate has had positive outcomes in Pakistan. However, the counterfactual is not clear; in the absence of the mandate, we do not know whether ATM card interoperability would have been achieved anyway. Box D below describes the case of Ghana in which the Central Bank also mandated interconnection in retail payments at a relatively early stage. Where Pakistan was successful in respect of ATMs, Ghana serves as a cautionary tale of how mandated interconnection may be hard to enforce and even have limited effect.

Box D: Ghana: a cautionary tale of mandated interconnection and interoperability

The Bank of Ghana (BOG) embarked on a payment modernization process in 2000, passing an NPS Act (2003) and setting up an RTGS (2002). With a desire to promote greater efficiency of the retail payment system, the central bank embarked on a process of encouraging the banking system to establish a national retail payment switch. In 2007, the BOG established a new subsidiary company, Ghana Interbank Payment and Settlement System (GhIPSS: http://www.ghipss.net/) which had the mandate of partnering with the banking sector to provide and manage infrastructure for electronic payment systems. It was originally envisaged that banks would co-own shares in GhIPSS, and even eventually, spin it off from BOG; but banks proved unwilling to make the investment necessary. BOG went ahead anyway as the sole funder using its own funding and senior BOG personnel were seconded to lead GhIPSS.

BOG purchased the Net1 system, which was launched in 2008 in Ghana under the brand eZwich. eZwich was a full payment system, offering not only a transaction switch but also a new payment instrument (the smart cards used to transact on compliant ATM or POS devices).

In parallel, using its regulatory powers through issuing a circular in January 2008, BOG mandated integrating all existing bank switches to eZwich and ensure that all future switches were eZwich compliant. The mandate went further though: banks were also required to issue eZwich cards (which they had to buy from GhiPSS for around $3 but provide free to customers) to all their existing personal customers and deploy eZwich POS devices in all their branches and agencies. Later that same year, BOG issues branchless banking guidelines[34] which insisted on a bank-based approach and prohibited exclusive partnerships. Instead, only the 'many to many' model was to be allowed. A case study in 2010 found that the take up of the smart card had been very low: barely 300 000 cards had been issued by banks, constituting 10% of the estimated banked population. While banks had bought stocks of the cards as required and had deployed POS devices at branches, the larger banks on the whole were reluctant to issue since they saw little business case to issue the new cards and from using the proprietary system. Balances held on cards (linked to bank accounts) were low; and the average card had fewer than one transaction per year in 2009, despite large advertising campaigns funded by eZwich.

By contrast, Visa debit card issuance had risen rapidly: 9 domestic banks had become members of the card association; and the ATM network connected through VISA (using a domestic interchange rate which reduced the cost of not on us below the default rate which had previously applied) had grown six fold. Visa ATMs could not accept the eZwich smartcards without a biometric add on to enable fingerprint reading. Also, several mobile payment services such as MTN Mobile Money had been launched since the start of eZwich on the many to many model. The unexpectedly rapid rollout of cell phone penetration to 68% made possible these on-line systems which focused on money transfer.

[34] Notice No. BG/GOV/EC/2008/21

Although in 2011, GhIPSS planned to continue adding additional features to cards and to subsidize the deployment of infrastructure and promoting the card through media campaigns, the utility of the smart card payment system to its issuers and acquirers was in doubt. It had proved difficult to enforce all aspects of the interoperability mandate: even if all bank switches had become eZwich compliant, that was not sufficient to incentivize issuance and the deployment of acquiring infrastructure which was BOGs real intent.

However, GhIPSS had also launched other utility functions, including a check codeline clearing project. This project was well received by banks since it had cut the time and costs to process paper checks and converted this inefficient paper-based payment instrument into a more efficient one.

Source: BFA: Case study on e-Zwich prepared for Windsor Conference on Branchless Banking March 2010

Interbank funds transfers: A qualified success of market-led standards

While the case of ATM card interoperability attracted the attention from regulators, there is another example of a relatively high level of interoperability being achieved in Pakistan without intervention: that of interbank funds transfers (IBFT). This payment instrument was introduced by 1LINK for its member banks, offering real time clearing from devices like own ATMs to any account of a bank which has signed up for the service, as 20 banks so far have. The cost per transfer is set by the issuing bank, and averages around Rs50 at present. This cost is apportioned in accordance with ATM norms; Rs2 is paid to the switch, Rs1.39 to FBL and Rs11.61 to the acquiring bank. Although the share of IBFT in electronic transactions is not high, the technical ability to clear and settle retail transactions in real time is uncommon for a country of Pakistan's level of financial sector development.

IBFT interoperability has not been mandated but rather evolved as a product innovation on the base of the infrastructure developed by 1LINK, driven in part by the commercial incentives of the technology provider and the settlement agent bank behind 1LINK to increase revenue through greater volumes. However, as reflected in the measure of interoperability, IBFT access exists only for 1LINK member banks today—accounts at MNET are not currently able to initiate or receive inter-switch transfers.[35] The existence of real time clearing on this basis is, however, a very positive aspect of the infrastructure available in Pakistan, which exceeds that available in many low-income countries. This development shows how multi-party owned switches can innovate, although the speed and scope of innovation is dictated by its governance process: 1LINK cannot introduce new products without the majority approval of its board.

So we cannot conclude from the history in Pakistan that regulatory intervention is always necessary to achieve high levels of interoperability, but neither can we say that intervention has been or will necessarily be harmful. The key regulatory questions are therefore not about whether to intervene, but rather to understand the circumstances in which the natural trajectory of market development is less likely to lead to an effectively interconnected outcome and then only to make a case for appropriate intervention.

[35] Initially, MNET's switching application did not support this transaction type. Euronet has since developed the capability, but, to date, no MNET member bank has requested certification.

4. MEASURES TO PROMOTE THE DESIRED SCENARIOS FOR PAKISTAN

The framework detailed in Section 3 allows us to discuss a series of policy measures which may help to unlock the desired end game depicted in Quadrant 1 of Figure 3, following the green line trajectory in Figure 4. Some of these measures, such as the use of regulated third party service providers (TPSPs), are under consideration whereas others are new proposals. All are considered in the light of whether intervention is necessary and helpful to support the trajectories necessary to achieve the desired outcomes.

4.1 Third party service providers

A draft regulation envisaged the designation of a new class of entities as "third party service providers" (TPSPs). TPSPs will be licensed by the PTA under the class licensing regulations for value added providers using telecoms networks and be listed by the SBP as designated payment systems. Since they are not financial institutions, they many not store value (as a bank or e-money issuer could, for example) or directly offer their own transactional channels such as agents; however, they may offer a range of technical services. The current definition of technical services offered by a TPSP is very wide, including a wide variety of IT services.

Since TPSPs cannot be account providers themselves, the business model of a TPSP is based on providing a service to providers which addresses the current 'pain points' in their cost structures such as:

1. High transaction costs of negotiating connections between each mobile operator and banks, and of installing interfaces to each
2. Overpriced transaction handling charges
3. Lack of scale in buying bearer channel connectivity from MNOs
4. Lack of access to MNO or bank channels due to anti-competitive behaviour
5. Lack of economies of scale in specialized activities such as processing transactions and account hosting.

In the Pakistani market of five telcos and more than thirty authorized deposit-taking institutions, hub-type structures are likely to reduce costs by centralizing clearing and settlement and reducing the need for each entity to incur resources to build, test, and monitor more than 150 separate bilateral interfaces. Indeed, this is the reason for the growth of switching services offered by the existing two financial switches in Pakistan, which have extended well beyond ATM transactions. If the overall aim is cost reduction, it is unclear if there is a need to authorize more switch providers

Whether a TPSP will be able to reduce the costs of bearer channels (such as SMS, USSD, IVR) by bulking up usage of several providers and negotiating bulk discounts from MNOs will depend on MNOs' willingness to negotiate.

This willingness may be in question if the MNOs are themselves also providers of mobile financial services. This raises a more general competition issue: *If, instead, the pain point for providers is an inability to negotiate access on suitable terms to mobile bearer and to bank channels, then there is a need for a clear, firm dispute resolution process to address this.* One draft of the TPSP regulation provided for a tiered dispute resolution process for TPSPs with regard to interconnection pricing which has not previously existed for these services—ultimately, a coordination committee comprised of PTA and SBP would step in if a dispute cannot be resolved among the parties themselves. The existence of such a mechanism, if perceived to be fair and transparent in the principles to be applied, may prompt

more rapid agreement than otherwise has been the case and may thus contribute to interconnection. Such a mechanism is likely to be needed by the market as a whole—hence this issue deserves more general treatment in Section 4.2.

It is also not clear that a new entity like a TPSP by its existence and function alone will bring benefits. TPSP activities may involve specialized, high-volume IT, requiring both high robustness and high security. Such activities may even fit within the existing financial switches. The example of a TPSP-like entity in Colombia described in Box E shows how building a common interface between banks and MNOs, while convenient for providers, is not sufficient to promote adoption among banks or end-clients. In particular, the case underscores the importance of appropriate pricing of payment services and of functionality for end-users. While the Colombian platforms are technically interconnected, they nonetheless fail to drive volume increases, owing, in substantial measure, to user fees that are too high and to poor user interfaces.

The extent to which TPSP regulations function as a key or an impediment will depend on 1) the extent to which the desired TPSP use cases are defined to provide greater clarity as to intent, and 2) the extent to which these correspond to resolving the potential blockages above. TPSPs may bring cost savings under the circumstances defined, although it is not certain that they will reduce overall costs; more importantly, perhaps, it is clear that cost reduction alone is not sufficient as a key to unlock the desired end state.

Introducing TPSP regulations may be useful in harnessing productive efficiencies in processing and switching although if there is further fragmentation of switching, it could also undermine them. However useful, TPSPs are not necessary for the achievement of the desired outcomes, and are certainly not sufficient.

Box E: TPSPs IN COLOMBIA: PUSHING ON A STRING?

In 2005, the Financial Ministry of Colombia passed Decree 1400 which brought the operators of low value payment systems under the supervision of the financial regulator, SFS. Low value was defined by an average daily value of transactions cleared of less than the equivalent of $1.2 million. Previously, only high value payment systems were subject to regulation by the Central Bank under the national payment systems law.

Colombia currently has two supervised low value payment systems, which are bank-owned and evolved from the two card associations: Redeban Multicolor, which has the Mastercard acquiring franchise, and Credibanco, the local Visa franchise.

Both payment system operators perform a variety of the range of roles associated with the definition of TPSPs in Pakistan: that is, they operate switches, process transactions, and host accounts for members, can acquire merchants and agents directly. Importantly, Redeban has implemented a secure mobile platform with all the major telcos in Colombia for the purpose of facilitating secure mobile banking transactions for member banks. In terms of this approach, the switches host mobile platforms which enable any bank customer registered for mobile banking to use a standard STK menu on their handsets to transact securely with their bank via the switch. However, the cost per mobile banking transaction is considered relatively high (around COP100 = 5.5cUS); and in particular, the user interface is considered slow and inconvenient, certainly compared to card or internet transactions.

These factors have meant that, while mobile banking has been available to all Redeban member banks which have implemented the interface, the take-up has been disappointingly low. As a result, despite having these centralized platforms, Colombian banks have been exploring other channels for mobile banking as well.

Sources: http://www.redebanmulticolor.com.co/portal/page/portal/indexcol/index
https://www.visa.com.co/visa-colombia/comercios/credibanco-es-su-red.aspx

4.2 *Fair channel access*

MNOs control access to, and pricing of, their bearer channels for mobile financial service transactions. Bearer channels differ significantly in their security features, pricing, and fitness for mobile financial services. Current generation services are configured for use on basic handsets, using widely available channels such as SMS or USSD, even though these channels were not designed for and are not optimized for financial services. The level of commercial use and availability of these services varies across providers, limiting access to groups of customers of particular networks with which terms have been agreed. If MNOs compete not only to provide bearer channels to clients like banks, but also to provide financial services over these channels through partners or subsidiaries in competition with those banks, there is a heightened risk that strategic competition may limit the extent of channel access which undergirds interoperability.

To unlock dynamic efficiencies and competition in mobile financial services, it is essential that all authorized financial service providers have access to robust, secure bearer channels on a fair (i.e., non-discriminatory) basis. The importance of this issue was recognized in the Ministry of IT Directive of 2008.[36] This directive required operators to ensure interoperability between their systems "no matter which technical platform they chose to implement for m-banking service in collaboration with their banking and TPSP partners" (clause 6), and that "no operator may deny interconnection to another operator who has an m-banking system with the same or other FI's" (clause 8). The Directive also makes provision for quality of service benchmarks to be set and guaranteed to ensure that, for example, transaction times are within agreed maxima.

In practice in the current generation of mobile financial services, the fair access issue relates especially to access to the SIM card and to the USSD channel. Services which use SimToolKit (STK) encryption depend on access to SIM card security keys, which MNOs are reluctant to divulge to other parties. In principle, encryption keys could be held by a trusted third party in a TPSP model (such as Redeban in Colombia) and made available to a range of financial providers. However, the use of STK is reportedly limited by regulators in Pakistan, and the reasons for this limitation would need to be addressed first before this model would be viable.

The USSD channel has been much used for m-banking in other markets such as South Africa. However, there is not yet accepted or uniform market practice regarding making the channel available on a fair commercial basis. Uniform short codes for providers across networks (also provided for in the Directive Clause 7) will also facilitate uptake by making it easier to advertise one number to access a service. Ensuring fair access to the USSD channel for PTA is a key application of the 2008 Directive to enable subscribers of any MNO to access mobile financial services.[37] The Directive also makes provision for PTA

[36] "Policy Directive to Support Technical Implementation of Mobile Banking including mobile money transfers and remittances", 20 May 2008
[37] For more on the role of the telco regulator in fair channel access issues, see blog post by Ignacio Mas available via http://technology.cgap.org/2012/05/08/what-is-the-telecom-regulators-role-in-fostering-mobile-money/

to enforce these provisions and to become engaged in dispute resolution procedures should the parties not be able to come to settlement.

Ultimately, the growing adoption of smart phones, which combine a secure and convenient customer interface with the usage of data channels which are cheapest and over which MNOs have least control, will resolve the bearer channel bottleneck. However, smart phone adoption, while rising fast, is currently estimated at less than 10% of Pakistani subscribers. Models which seek mass adoption in the period under consideration here (to 2020) will still need to be based on basic and feature handsets.

Therefore, we recommend that PTA clarify the application of the 2008 Directive to ensure that licensed branchless banking services should have access to priority bearer channels such as USSD across MNOs on terms equivalent to those offered by any MNO to its own subsidiary or affiliated mobile financial service.

4.3 Sharing agent networks

For financial service providers, acquiring agents to undertake transactions differs from rolling out infrastructure such as branches and ATMs since the acquirer does not have full control over an agent. The agent may respond to incentives but the acquirer may not able to enforce contracted terms on the agent in the way that it could with its own staff (or a programmed machine like an ATM). For example, it is already proving difficult for acquirers in Pakistan to enforce exclusivity agreements with agents. In practice, agents are responding to incentives to be 'multiple acquired' so that they can offer more services to more people and generate greater commission revenues. This informal 'interoperability' through the agent is the *de facto* type emerging in many developing countries today, meaning that agents are the points at which clients from multiple schemes are served even with no formal agreements between schemes.[38] This trend is likely to grow with increasing competition among schemes in Pakistan, with new schemes reportedly even advertising to attract agents of existing schemes. With the choice of different schemes to send money, agents will route their clients' cash transfers through whichever scheme offers the agent the best commission structure or overall proposition.

However, while such informal interoperability may enable more customers to be served in the short- to medium-run, it carries costs for the payment system as a whole. For network acquirers, multiple acquiring is likely to be inefficient, since each must incur costs every time an agent is recruited, and each agent must be monitored and the relationship managed. For the agent, being multiple-acquired requires holding multiple floats at different banks and undertaking multiple reconciliations. It also means that only the 'prime' locations are likely to be served, with a thick enough mix of clients of each scheme separately to justify the deployment of the scheme.

By comparison with informal interoperability, formal 'sharing' of agents can happen in various ways. First, at one extreme, it is possible to envisage having one national agent acquiring entity, to which all eligible issuers connect. This is the norm followed in some countries such as Brazil in the card sector, in which merchant acquiring has been centralized for each scheme. The same argument can be made for owning and managing ATM networks, although full centralization in a single utility seldom results. It is also akin to mobile tower sharing where MNOs outsource the construction and maintenance of masts to a third party in return for a fee, which has started to happen, albeit in a small way in Pakistan today, as the nature of competition evolves from access and coverage to price and service.

[38] One estimate is that around 10% of the current agent total in Pakistan is already overlapping; this is likely much higher in other countries with schemes which have competed for longer such as in Tanzania.

Such a national utility scheme may bring productive efficiencies because there is no duplication of infrastructure (among the members of scheme, at least) and because investment costs are shared across participating issuers and other capital providers. However, it may not result in improvements to dynamic efficiency, as the utility acquirer may not be most effective over time at sustaining the relationship with the agent. Additionally, a national utility scheme may function as monopoly that would require oversight, and even price regulation, from regulators.

Second, as an alternative to one national acquiring scheme, agent acquirers could agree to interconnect with issuers such that their agents could accept deposits or allow withdrawals from clients of the others. Note that this is not really 'sharing' in the same sense, since the agent remains the customer of one acquirer (rather than of the central acquiring entity); it is rather about interconnecting schemes for the purpose of agent transactions. To do this requires an inter-scheme arrangement on pricing and interchange, as well as a switch that allows real-time clearing across accounts. The first requirement does not exist although the second does. The IBFT instrument currently allows a client to send money to the account of an agent of another bank in real time. If a notification were supplied to the handset of each party, this could form the basis of confirmation to enable the exchange of cash.

However, while widespread IBFT may enable cash in and out to happen, the pricing of the current IBFT instrument does not encourage this transaction type: quite apart from the high average charge to the end-client to initiate an IBFT, the agent as either receiver or sender of transfers is likely charged by his bank for IBFTs, rather than being paid to do it. There is currently no agreed basis to pay a fee to the agent for cash exchange transactions, hence little incentive for agents to accept cash for deposit in this way, even if there is the traditional incentive to provide cash (i.e., the subsequent in-store spend). To use the existing infrastructure, there would be a need to define the different pricing scheme for a different transaction type within IBFTs. In other words, the specific use case of agent interoperability needs to be agreed separate from, although enabled by, the use case of platform interconnection for IBFTs. Additionally, such a scheme may need to provide for agent acquirers to receive compensation for not-on-us transactions.[39] The determination of interchange for acquirers and issuers, and, consequently, remuneration for agents in cross-scheme cash exchanges will be crucial to incentivising the growth of this type of formal interoperability.

Is such formal interconnection of agents among schemes likely to emerge without intervention in Pakistan? Current network managers profess to be willing to interconnect in future, but 'not yet'. This situation may prevail as long as the competitive advantage of a mobile money scheme is built on drawing new voice subscribers into an outlet (since the over-the-counter product does not require that customers of other networks switch to use the agents of another, merely that they stick to cash). However, the relative advantage of this position declines as:

(i) More schemes enter the market, reducing first mover advantage
(ii) The growth of the voice market slows naturally as a saturation point is reached
(iii) Due to more competition, agents demand higher fees to maintain the service, squeezing revenue on the service.

At present, these conditions seem likely to emerge on their own in Pakistan, tipping the market toward a state in which incumbents would negotiate the conditions under which the customers of other

[39] See fuller exploration of this issue of agent sharing in Bezuidenhoudt (2012) about shared mobile money agents in Tanzania

schemes could deposit or withdraw at their agents. The incentives to do this would hinge on the pricing of carriage fees, as in ATM networks. *A premature requirement to interconnect could destroy the incentive of incumbents (or entrants) to deploy further agents to increase coverage.*

In addition, as more customers open and use a mobile wallet, they become less dependent on the agent, and are able to initiate and receive payments on their own from other customers; hence, the value alone of having a large agent network should decline naturally over time. Promoting take-up of wallets should also be in the long-term interest of the scheme operators, for most of whom the business case is not built on fee margins from over-the-counter transactions but rather on long-term retention.

In order to get to anywhere near the critical mass of cash handling locations needed on the road to 'inclusive cash lite'—which is many multiples of the current number of agents—the country must encourage and sustain robust business models in which providers benefit both from deploying more agents and from aggressively seeking wallet-based customers (as discussed in Section 4.4). This requires that large providers with deep pockets continue to have an incentive to roll out new agents. Intervention to force interconnection of agent networks seems premature now, and may damage these incentives. But regulators could nonetheless signal that they will ultimately require agents to be interconnected for cash deposits and withdrawals, once a critical mass of deployment has been reached. Based on the estimates of numbers of agents required to reach a cash lite world, this number is likely to be well in excess of 100,000 agents.

We therefore recommend that interconnection of agents for cash in and cash out not be mandated until deployment has reached a defined critical mass; but that SBP signal now that interconnection of agents for cash in and out will ultimately be expected, and will be required if it does not evolve spontaneously.

4.4 Authorizing electronic money issuers as a new category of FI

Interoperability will lead to a reduction in the costs paid by customers to transact when it enables widespread access to cash (i.e., reduced transaction costs for the customer); and, in the long run, when it allows new specialized business models to emerge which compete with incumbent models. Since the need for cash handling points declines in a cash lite scenario, the competition will ultimately take place around issuance business models. Interoperability could enable new, specialized issuer models to emerge earlier, using access to the infrastructure of others, and this could challenge the business models of incumbents.

Issuers in Pakistan must be authorized deposit-taking entities such as banks or microfinance banks. To avoid the risks of mixed incentives and lack of control in joint ventures, MNOs in Pakistan wishing to launch mobile money models have, to date, preferred to use the lowest-cost way to enable them to control the issuance process: buying a controlling stake in a microfinance bank (MFB), following the precedent set by Telenor's acquisition of a majority stake in Tameer Bank in 2008.

The MFB license provides a legitimate but 'back door' means for a telco to enter the provision of branchless banking services at relatively low cost, since the minimum capital required for MFBs is considerably less than for commercial banks. The microfinance bank is then allowed to take deposits (in this case, issue m-wallets) and to provide wide functionality for domestic payments. The licensing requirements for this class of financial entity impose constraints on the nature and size of services to be offered, such as the mandate to serve the credit needs of defined microfinance customers within defined size ranges, which has recently been revised.

The requirement to lend widens the business model of the MFB to allow for income from intermediation, but it also may add risk and cost relative to a 'narrow bank' approach. Narrow banks invest their deposits only in banks of a certain quality or in high quality debt stock and do not provide credit. Their focus is primarily on the transactional aspects of electronic money. As a result, they can specialize in electronic acquiring, managing risks in specialist areas such as e-commerce.

Pakistan's Payment System and EFT Act already provides for a specialized financial entity of this type, which is generally known as an e-money issuer (EMI). An EMI is defined in broad terms as an 'undertaking issuing means of payment in the form of electronic money and duly authorized to do so', and the Act, in section 24, stipulates that the State Bank may license e-money issuers. EMIs would then become authorized financial institutions alongside banks and microfinance banks under the supervision of State Bank.

The SBP has not yet activated this category of authorized financial institution. However, it has become increasingly common for regulators elsewhere to allow for a class of specialized transactional entities in order to provide a regulated window that encourages low-value transactional business models. For example, countries like Peru and Colombia, both currently bank-based regimes, are introducing legislation in 2012 to allow for this type of specialized entity.

Enabling this specialized class of authorized financial institution may help unlock more competition for the issuance of electronic stores of value. As authorized financial institutions, EMIs could then interconnect into the wider financial system through becoming members of retail switches, much as MFBs can today.

Indeed, if the focus is to encourage reaching large numbers of customers, then the terms of authorization can be set to encourage entry via this route. For example, capital requirements for this special class of issuer are typically lower than those required of banks due to the narrower risks assumed. This reduction alone shaves costs from issuance, since there is not a requirement to earn profit on larger amounts of capital. SBP could also reduce the requirements for holding required reserves and for making contributions to deposit guarantee funds in the current microfinance bank rules. Instead, supervisors would ensure that EMIs manage operational risk and maintain liquid investments in a range high-quality instruments, exclusively.

It is even possible that EMIs could be collectively owned by groups of banks (and/or telcos) with the aim of acquiring basic accounts at lowest possible cost (i.e. operating as a transactional utility), and linking these accounts to additional financial services which would then be provided by the bank or microfinance bank. This approach would focus on achieving economies of scale in the operation of narrowly defined transactional platforms, but, since the scope of an EMI as an authorized financial service provider is broader than a TPSP as defined, this new category of financial provider may be more useful than a TPSP for the purpose of encouraging competitive low cost electronic business models.

We therefore recommend that SBP consider authorizing and supervising e-money issuers to issue electronic stores of value.

4.5 Promote interconnection of IBFTs

Despite a general lack of data on current payment patterns in Pakistan, Section 2 (Box B) highlighted the low starting level of electronic payments per capita.

Although there is a long way to go to reach an inclusive cash lite stage, there is no reason to believe that, if offered convenient, safe, and affordable payment options through which they could make payments to a wide network of other people, Pakistani customers would not use them on large scale. Kenya provides an instructive example of how powerful network effects may be: five years after the launch of mobile money, 72% of the adult population is registered for the leading service, Safaricom's M-Pesa, alone. A recent World Bank survey found that more than 60% of adults reported using their mobile phone in 2011 to send and receive payments to other people (compared with 1.5% in Pakistan).[40] Even though M-Pesa is **not** yet interconnected for electronic payments to other mobile schemes, the size of the accessible network of this dominant scheme alone is large enough to generate substantial network effects and to provide evidence that the uptake could be strong and fast, once a critical network size is reached.

In Pakistan, even combining the voice clients of the two largest MNOs does not achieve an addressable network of proportional size to M-Pesa's (55% of voice subscribers as opposed to more than 70%). Therefore, there is a real risk that, unless mobile payment schemes interconnect soon enough, the fragmentation of the Pakistani MNO market may dampen the network effects in ways which lead to sub-optimal outcomes: customers don't use electronic payments because they can't access a useful enough range of payees, and they can't afford the alternative of registering for multiple providers, or, even if they do, already low revenue streams per customer are further divided across the combined larger cost bases for the sector.

The likelihood that strong network effects exist for certain categories of pure electronic payments (account-to-account through real time credit transfer) makes a case that interconnecting *schemes* (or platforms) earlier, rather than later, may help to fuel the growth of the payment market.

Furthermore, as shown in Section 3, Pakistan already has one element of the infrastructure necessary to enable this in 1LINK IBFTs, even though it is not presently priced or designed for an inclusive cash lite future. Today's m-wallets are also issued by banks which are already members of 1LINK, although the interfaces have not yet been built which enable payments to be made to or from these accounts to other 1LINK member bank accounts. We heard that this may be imminent; however, if it is unduly delayed, there may be a good case for regulatory pressure in this particular use case. This pressure may also be needed to ensure that new entrants also interconnect in this way.

We therefore recommend that SBP signal that it expects within a relatively short period (such as year) that interconnectivity for IBFT will extend to all 1LINK banks, between the two switches and between bank accounts and mobile wallets. If this did not evolve through interbank negotiation, then SBP should reconsider mandating this form of interconnection.

[40] World Bank Global Findex 2012

5. CONCLUSIONS & IMPLICATIONS

Taking on and sustaining three times as many new customers as the current total number of accounts in the banking system is a highly demanding objective for any society. The current trajectory of growth in branchless financial services, while promising in several aspects, is likely not sufficient to achieve this.

Greater interoperability in defined use cases can play a key part in unlocking the desired end-state, but must be handled with care in each. First, agent level interoperability for cash in and out can help to rationalize the heavy investment necessary in cash handling infrastructure enabling greater efficiency in payment systems so that inefficient multiple acquisition of agents is minimized and it enables competition such that cost savings are passed on. However, interoperability at this (mainly the agent) level is a two edged sword: forced prematurely, it will depress the incentives to roll out a network of the size required; encouraged to evolve at the right time, it may indeed rationalize the extent of overlap and agent churn.

Second, platform level interconnection can create a compelling network effect that helps to pull consumers unaccustomed to making electronic transactions into a world in which their friends, employers, suppliers, and government agencies are all able to make these payments cheaply, safely and quickly. This requires ultimately full 'any to any' interconnection which allows real-time push transfers across any and all electronic stores of value, and that these transfers happen on a basis which is very low cost to the user. This level of interoperability would create the essential backbone for further transaction types (such as cash in and out across networks) to be handled. Pakistan is already not far from achieving this but fragmentation in the market may limit the speed of adoption if this interconnection is not achieved. For that reason, we have recommended that there is good reason to prioritize the achievement of full interconnectivity of the current IBFT instrument across both bank accounts and mobile wallets.

These two key interoperability use cases necessary for an inclusive cash lite society raise important questions about the role of the SBP: what does it need to do, if anything, to ensure these outcomes?

First, regardless of action taken, because of the importance of the issue, SBP has a role in collecting the data necessary to monitor progress towards greater effective interconnection, as it does on other payment-related topics. *We recommend that SBP collect the data necessary to monitor interoperability of defined use cases which support policy objectives; as well as to research customer payment behaviour in a systematic fashion, in addition to or as part of other market research surveys which are contemplated.*

Second, regulator choices with respect to actions to promote interoperability are often framed in terms of a binary choice to 'intervene early' (*ex ante* in traditional framing of competition policy issues) [41] or 'do nothing until specific problems arise' (*ex post*). Both approaches carry weaknesses, as we have already argued: early intervention may lead to the achievement of interoperability but at the cost of trade-offs with other important objectives, while the 'do nothing, until problems arise' approach may create lingering uncertainty over what are defined to be 'problems', and by then, intervention may be

[41] See for example Bellis and Houpis (2007) "Competition issues in the development of m-transactions systems", Vodafone Policy paper series no.6, July 2007 p.36-40

too late to maintain market momentum or too difficult to succeed in the face of entrenched market positions.

Instead, we propose a *managed approach* to interoperability in which the regulator establishes a clear framework of expectations around the timing and role of interoperability in achieving its broader goals. In this managed approach, rather than having action driven by undefined future 'problems', the issue of what is a 'problem' is placed in proper perspective of broader developments in the payment system, and broader desired objectives.

For SBP, this managed approach would require setting up a sequence of milestones which mark the pathway towards overall desired outcomes such as large scale inclusion. As long as progress continues towards defined milestones, no intervention is needed (i.e., 'do nothing' would be justified). The difference from a 'do nothing' approach is that a clear signal of intent has been sent, which requires market players to consider this issue now in their business plans rather than ignore it, and also clarifies market expectations so that the threat of unspecified intervention does not lurk over incentives for providers to roll out infrastructure on which others may freely ride. However, if progress towards a milestone is unduly delayed, then intervention may be triggered through a range of regulatory actions, including mandated interconnection, as happened with ATMs.

Deciding on the nature and timing of the milestone objectives should be a part of the wider process of building a national retail payments roadmap. This roadmap must take into account all the elements necessary, not only the question of interoperability, to achieve the specified national vision for retail payments. As Section 2 showed, interoperability is not an objective in itself but rather both an ingredient for and an outcome of a healthy inclusive retail payment system. Also, the retail payment vision must not be restricted to the use of current branchless approaches or the mobile channel alone: the wider payment ecosystem must be considered, with its interrelated overlapping providers, and, ultimately, the same end users of different channels and instruments. As part of the roadmap, issues such as payment arrangements to support e-commerce arrangements need to be considered as well. For this reason in part, we have made the case here for SBP to consider authorizing new forms of specialized business models, such as e-money issuers, which can compete and thrive in an interoperable world alongside existing providers.

There is already a strong precedent for such a process of establishing a sector-wide vision and work plan. As Section 3 explained, the ATM interconnection mandate issued in 2002 followed the recommendations of a taskforce appointed by SBP in 2000 which included banking industry representatives. This task force created a process in which the views of a wide range of players could be discussed and engaged, resulting in a robust and cohesive vision which has guided electronic developments in much of the last decade, and providing the basis for card interoperability in the ATM networks. The time appears ripe now, therefore, for SBP and other government agencies with compelling interests to convene a new taskforce.

We therefore recommend that SBP, with PTA and other relevant government agencies, appoint a task force which includes private sector experts to recommend a retail payments roadmap which will achieve specified outcomes, such as the 'inclusive cash lite' vision.

The taskforce should be established under terms of reference that define the desired end-policy objectives and establishes a defined timeframe. The task force should be required to engage in wider consultation including with consumers where necessary. Given the dearth of accurate information on

consumer payment patterns and preferences, at least among the unbanked sector, it would be necessary to commission credible research to inform the discussion and then to monitor changes at a customer level. This type of process has been followed constructively by the UK Payment Council (see Box F) in developing the first UK National Payments Plan in 2008, and then keeping it updated.

Box F: The UK Payment Council charts a collaborative road map for UK payment systems

The UK Payment Council was established by the payment industry in the UK in 2007 to ensure that it meets the needs of its members, its users and the wider economy. It was set up following a multi-year investigation by the Payment System Task Force established by the UK Office for Fair Trading into the structure of the payments sector in the UK after an independent commission (Cruikshank Commission) found areas of concern in the way the payment system was governed and controlled. The Task Force concluded its work in 2007,[42] with the Chancellor of the Exchequer approving the structure of the Payments Council as the new way of governing collaborative initiatives.

The Payments Council has three main objectives:

- To have a strategic vision for payments and lead the future development of co-operative payment services in the UK
- To ensure payment systems are open, accountable and transparent
- To ensure the operational efficiency, effectiveness and integrity of payment services in the UK.

To achieve its objectives, the Payment Council is a membership organization covered by a set of rules and governed by a board. However, the special feature of its governance is that, of the 16 directors on the board, 11 are appointed by vote of the members and four, as well as the non-voting Chair, have to be independent of members. Though the independent directors are in a minority, they carry special powers of veto and are required to publish an annual report of their own, alongside the organization's annual report. This allows them to comment publicly and transparently on the decisions and strategies of the Council. The Bank of England as the payment oversee also has an appointee on the board. This special governance structure was designed to achieve a balance between the allowing the members with direct interests in payments to discuss and agree on collaborative strategies for the sector as whole, while ensuring adequate transparency and accountability to wider public interests.

The functions of the Council, which has a CEO and small full time staff, include providing statistical reporting for the sector, as well as undertaking particular projects which benefit the industry as a whole—for example, a report on the Future of Cash in the UK (2010).[43] The Council also coordinates and leads collaborative projects in the payment sector. A recently announced example of this is the announcement in February 2012 that the Council will build a central database which will map mobile phone numbers to bank accounts enabling payments made to mobile numbers to be routed to bank accounts.[44]

Perhaps most importantly, the Council is responsible for the National Payments Plan.[45] This sets out the agenda of the Council and the vision of the sector as a whole over a five to ten year period. The first Payment Plan was published in 2008 following a widespread public consultation process among members and users. One of the most controversial aspects of that plan as the objective to phase out paper checks by 2018. Recently, following further

[42] http://www.oft.gov.uk/shared_oft/reports/financial_products/oft901.pdf
[43] http://www.paymentscouncil.org.uk/resources_and_publications/publications/strategic_reviews/
[44] http://www.paymentscouncil.org.uk/media_centre/press_releases/-/page/2041/
[45] http://www.paymentscouncil.org.uk/what_we_do/national_payments_plan/

consultation and reconsideration, the Council has abandoned this objective. The Council announced a revised Plan in 2011. In this plan, the Council sets out the main objectives as fostering innovation and inclusion in the Uk Payment system, while ensuring its robustness and integrity.

Source: Payment council reports available via website http://www.paymentscouncil.org.uk/who_we_are/

Interoperability has indeed a key part to play in enabling pathways towards a desired future for the financial sector in Pakistan, but it needs to be clearly understood, defined, and measured in the context of what it can—and cannot—achieve. The sequenced achievement of greater effective interconnection across priority use cases is necessary to achieve that future but it is not sufficient. While much emphasis has traditionally been placed on how interoperability may reduce the costs of rolling out infrastructure-heavy financial services like cash or transaction handling points such as ATMs or POS, its bigger impact will likely come on the demand side, where it widens the options and functionality for payment system users. However, communicating these benefits to, and promoting and sustaining usage by, large numbers of first-time users will require a concerted effort from across the entire financial sector of Pakistan. Planning and mobilizing that concerted effort will demand the skills and perspectives of a new task force.

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ANNEX A: LIST OF PEOPLE MET

No.	Institution	Name	Title
1	State Bank of Pakistan	Yaseen Anwar	Governor
		Inayat Hussain	Executive Director, Banking Policy & Regulations Department
		Mansoor Siddiqui	Director, Banking Policy & Regulations Department
		Muhammad Akhtar Javed	Additional Director, Banking Policy & Regulations Department
		Rajesh Raheja	Deputy Director, Banking Policy & Regulations Department
		Rehan Masood	Assistant Director, Banking Policy & Regulations Department
2	1LINK (Guarantee) Limited	Faisal Ejaz	Chief Executive Officer
		Akber Sultan	Head Technology
		Fahad Sahab	Head Business Development
3	United Bank Limited	Abrar Mir	Group Head Branchless & E-banking
4	Habib Bank Limited / 1LINK (Guarantee) Limited	Ayaz Ahmed	Chief Financial Officer / Chairman
5	Abu Dhabi Group	Abbas Sikander	Chief Operating Officer
6	Euronet	Shahid Latif	Chief Executive Officer
		Karim Jindani	Manager Product Development & Technical Sales
7	Bank Alfalah	Atif Bajwa	Chief Executive Officer
8	Institute of Business Administration	Dr. Ishrat Hussain	Dean & Ex-Governor State Bank of Pakistan
9	USAID Pakistan	Kanwal Bokharey	Economic Growth Advisor
		Kathleen A. McGowan	Senior Policy Advisor
10	Pakistan Bankers Association / Barclays	Shazad G. Dada	Chairman / Chief Executive Officer
	Pakistan Bankers Association	Masood H. Raza	General Secretary
11	Habib Bank Limited	Mudassir Khan	Chief Information Officer
12	e-Access, Cyber Access Group	Imran Qureshi	President
		Owaise Zaidi	Chief Operating Officer
13	Tameer Micro Finance Bank	Nadeem Hussain	Chief Executive Officer
14	Telenor	Roar Bjærum	Vice President Financial Services
15	Ufone	Noman Azhar	Project Incharge, Mobile and Branchless Banking
		Shahid Habib	Executive (VAS) - Mobile Financial Services
		Mahmood-ul-Hassan Shaikh	Manager(VAS) - Mobile Financial Services
		Taimur Cheema	Head Mobile Financial Services

16	PTA	Dr. Mohammed Yaseen	Chairman
		Dr. Saleem	Director General
		Arif Saranga	Director
17	Khushali Bank Limited	Ghalib Nishtar	Chief Executive Officer
		Nasir A Naqvi	Head Information Technology
18	Mobilink	Aniqa Afzal	Head M-Commerce
		Rashid Khan	President
19	Competition Commission of Pakistan	Rahat Kaunain Hassan	Chairperson
		Nadia Nabi	Senior Joint Director
		Shaista Bano	Director (Cartels)
20	Askari Bank	Javed Iqbal	Chief Information Officer
21	USF	Parvez Iftikhar	Ex-CEO
22	Zong	Ali Raza Shah	Head Mobile Commerce
23	Benazir Income Support Program (BSIP)	Ahsan Ali Mangi	Director General (Operations)
		Gul Najam Jamy	Project Manager
		Noor Rahman Khan	Director Payments
24	NADRA	Ali Arshad Hakeem	Chairman
	NADRA Technologies Limited	Lt. Col(R) Hasnain Mehdi	Chief Operating Officer
		Usman Y. Mobin	Chief Technology Officer
25	Visa International	S. Amer Pasha	Country Manager Pakistan & Afghanistan

ANNEX B: TABULATION OF INTERVIEWEE RESPONSES TO QUESTIONNAIRE

Note that not everyone we met was able to supply answers to the questionnaire, even though they expressed views on the underlying issues in the meeting, hence the numbers alone do not reflect the views of the full sample but are large and broad enough to give a reflection.

	Statement	Government (n=4)	Banks (n=5)	Telcos (n=4)	Others- switches/ tech (6)	Overall
1	There is a common understanding among key players in the financial sector in Pakistan of what interoperability means.	2.5	4	2	3.5	3
2	The State Bank has played an important role in promoting interoperability in the past.	2.8	2.6	3.3	2.5	3
3	Mobile payment instruments can easily be integrated into existing industry switching solutions.	2.3	1.8	2.0	2.7	2
4	Electronic payments are already highly interconnected in Pakistan.	2.8	1.8	1.8	3.2	2
5	The biggest obstacle to greater interoperability is the lack of international standards to follow for mobile payments.	2.8	3.4	4.0	3.0	3
6	Full interoperability creates challenges for the business models of some providers.	2.5	2.4	1.8	1.8	2
7	For greatest efficiency and lowest possible pricing, Pakistan ultimately needs one national switch.	3.0	1.8	2.5	2.8	2
8	Integrating mobile and agent banking into the existing payments framework is a key strategic need in Pakistan.	2.8	2	2.0	1.5	2
9	Achieving full interoperability of financial instruments is inevitable although it takes time.	3.3	2	1.0	1.7	2

ANNEX C: MEASURING INTEROPERABILITY

Table C1: Measuring card payment instruments at ATM

Level	Definition	No of accounts	Notes/ source
1	Theoretically interoperable	15,327,366	All card issuing banks are required to be linked to a switch since 2002
2	Technically interoperable	15,327,366	All card issuing banks are required to be linked to a switch since 2002; and the switches are interconnected.
3	Functionally interoperable	15,327,366	After initial teething problems between the switches, there is no reason to believe that the service level standards are not met
4	Interconnected	15,327,366	Agreements exist for all card issuing banks which are switch members
5	Effectively interconnected	15,327,366	The cost per "off us" transaction (Rs15/20c) is low both by absolute international standards and as a proportion of the average withdrawal size. Although there is no general agreement on affordability norm, we deem that this qualifies as 'effective'.
A	Total eligible accounts for instrument	15,327,366	This is the total number of cards in existence in 2011 according to SBP
	% measure at all layers (i.e. I5/ A)	100%	

Table C2: Measuring interoperability in cash in/ cash out at agents (cardless, mobile wallet)

Level	Definition	No of accounts	Notes/ source
1	Theoretically interoperable	929,184	The two existing providers' systems are capable of interoperating
2	Technically interoperable	0	Interfaces do not yet exist connecting the mobile wallet systems although this would be easy to do (Tameer and UBL are members of 1LINK)
3	Functionally interoperable	0	There are no standards yet for operation of the interface
4	Interconnected	0	There is no agreement between them for transfer
5	Effectively interconnected	0	
A	Total eligible accounts for instrument	929,184	Total number of m-wallets (only accounts capable of operating at agents at present)
	% measure (measured at level 4)	0%	

Table C3: Measuring interoperability in IBFTs

Level	Definition	No of accounts	Notes/ source
1	Theoretically interoperable	Less than 28,700,000 total banks accounts	Total number of bank accounts in on line branches and mobile wallets
2	Technically interoperable	12,963,057	Interfaces only exist across accounts at 1LINK banks
3	Functionally interoperable	12,963,057	1LINK interface seems to operate across banks adequately
4	Interconnected	# of accounts of the banks with IBFT agreement	Only the 20 banks which have signed IBFT agreements
5	Effectively interconnected	Depends on definition of 'effective'	No affordability standard yet exists; average reported sender charges of Rs50 are 0.1% of average transfer of Rs 50,000; but 5% of benchmark small transaction value of Rs1000
A	Total eligible accounts for instrument	28,700,000	Total number of all bank accounts and m-wallets (i.e. all stores of value at authorized financial institutions)
	% measure (measured at level 3)	46%	Because of the absence of any consensus around target price, we measure this instrument at layer 4.

ANNEX D: CALCULATIONS SUPPORTING PROJECTION

D1. Revenues and Costs per New Account

(In PKR)		Revenue basis	Cost to provider/ea	Total revenue/month	Total cost to provider/month	Net profit /month
A. Average balance in account	PKR	1000				
Float interest rate	%	7%		5.83	0	5.83
B. Electronic transactions	No/mo	Fee ea				
P2P	5	2	0.66	10	3.3	6.7
P2B (billpay)	4	8	1.32	32	5.28	26.72
	Value/mo	Commission				
P2MNO (airtime purchase)	270	5%	1.32	13.5	1.32	12.18
C. Cash in/out	No/mo	Fee ea				
Cash in	1	0	10	0	10	-10
Cash out	2	20	15	40	30	10
TOTAL PER ACCOUNT PER MONTH				101.3	49.9	51.4
	Months	Cost				
Cost of acquisition amortized	36	450			12.5	
Overhead cost of platform per account		10			15	
NET PROFIT PER ACCOUNT				101.3	77.4	23.9

D2. Cash Handling Infrastructure

(PkR/US$)	90							
A. CLIENT BASE		*2011*	*2020*	New clients		Source		
Total population	No	173,374,613	205,262,774			http://esa.un.org/unpp/p2k0data.asp		
Adult population	No	112,000,000	140,605,000					
% adults banked	%	22.5%	71.2%					
Number banked	No	25,200,000	100,110,760	74,910,760				
			1.					
B. SERVICING NORMS		*Pakistan 2011*	*MIC-average*		*2. Branchless banking*		*3. Cash lite*	
Branches	No/100000	8.6	14		14		14	
ATMs	No/100000	4.6	100		30		30	
POS	No/100000	33.0	1000		200		125	
Agents	No/100000	20.1	100		970		425	
Total touchpoints	No/100000	66.3	1,214		1,214		594	
Of which cash/in out	No/100000	28.7	114		984		439	
C. INCREMENT								
		Pakistan 2011	*MIC-norm 2020*	*Increment*	*Branchless banking 2020*	*Increment*	*Cash lite 2020*	*Increment*
Branches	No	9,600	19,685	10,085	19,685	10,085	19,685	10,085
ATMs	No	5,200	140,605	135,405	42,182	36,982	42,182	36,982
POS	No	37,000	1,406,050	1,369,050	281,210	244,210	175,756	138,756
Agents	No	22,500	140,605	118,105	1,363,869	1,341,369	597,571	575,071
Total touchpoints	NO	74,300	1,706,945	1,632,645	1,706,945	1,632,645	835,194	760,894
D. INVESTMENT REQUIREMENT (USD)								
		Per point	*MIC-norm*		*Branchless banking*		*Cash lite--IC*	
Branches	$	100,000	1,008,470,000		1,008,470,000		1,008,470,000	

D2. Cash Handling Infrastructure

ATMs	$	25,000	3,385,125,000		924,537,500		924,537,500	
POS	$	600	821,430,000		146,526,000		83,253,750	
Agents	$	250	29,526,250		335,342,125		143,767,813	
TOTAL			5,244,551,250		2,414,875,625		2,160,029,063	
Investment as % of:								
Banking sector equity 2011	%		*60.2*		*27.7*		*24.8*	
Banking sector NPAT 2011	%		*429.1*		*197.6*		*176.7*	