

**Mobile Payments Infrastructure Access and Its Regulation:
USSD**



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1. Mobile Payments Infrastructure Access and Its Regulation—USSD

1. The development of mobile payment services is an important financial innovation. It is expected to bring massive benefits to an economy because it allows for a cheaper way to extend financial services to a larger number of people—current users of financial services as well as the unbanked.¹
2. Given this potential, regulators face an important question: How can they ensure rapid development of mobile payment services? Competition among mobile payment operators (MPOs) is an important factor for the development of the market because it helps to keep the costs of these services low for consumers,² helps increase access points, promotes product innovation, and can ultimately contribute to greater financial inclusion.
3. Given that mobile network operators (MNOs) and banks are part of related markets (mobile communication and financial services, respectively), they are most likely to enter the mobile payments space.³ They also own a variety of infrastructure that may be required by an MPO:
 - 3.1. To enable its customers to carry out financial transactions, MPOs require access to a mobile communication channel, which is owned by MNOs. While most of these channels are offered commercially by MNOs, some channels may not be. One important communications channel is Unstructured Supplementary Service Data (USSD), which is often considered to be crucial for providing mobile payment services, on almost any phone, at low cost, to a large proportion of the population in the developing world.
 - 3.2. Similarly, MPOs need an extensive distribution network of cash-in and cash-out (CICO) points that allow customers to deposit or withdraw cash using their mobile-linked accounts. Banks have an existing network of automatic teller machines (ATMs) and bank branches that can serve as CICO points. An MNO has a retail agent network as part of its telecommunications business, which can be used as CICO points by customers. Further, they can leverage their expertise in building and managing a retail network to set up a new network of mobile money agents, if needed.
 - 3.3. In addition, a bank branch network is important as MPOs need the cash management facility of banks for their agents to deposit or withdraw cash.
4. Since MNOs and banks compete in the mobile payments market, and also own some of the required infrastructure for providing mobile payment services, it is possible that they may create infrastructure access problems for MNOs, banks, and other entities that do not own the required infrastructure (third parties⁴). These access issues could be in the form of complete denial of access to the infrastructure, providing access to the infrastructure but only at a high price, or providing access but degrading the quality of the

¹ Note that, in general, one does not expect all services to be offered at the start of a mobile payments platform. Initially, the mobile payment service is likely to include basic services like buying airtime and money transfer. Over time, as the ecosystem develops, more advanced financial services such as savings, credit, insurance, and merchant payments may be offered leveraging the platform.

² In this report customer and consumer is used interchangeably and refers to the final user of the mobile payment service.

³ There are also examples of nonbank, non-MNO mobile payment providers, such as Ferlo in Senegal; however, banks or MNOs are actively involved in driving most mobile payment services.

⁴ In this report, third parties could include other MNOs, banks, or nonbank non-MNOs.

infrastructure. These can potentially exclude competing MPOs by way of vertical foreclosure:

- 4.1. Vertical foreclosure issues may arise when two distinct markets exist at different stages of the same value chain—the “upstream” and the “downstream” market. Foreclosure refers to a situation where a vertically integrated firm (i.e., a firm that is present in both the upstream and the downstream market) having market power in the upstream market refuses to supply, or charges high prices, or degrades quality of its upstream product to its downstream competitors, such that the downstream competitors are unable to compete with the integrated firm.^{5,6}
- 4.2. For mobile payment services, the infrastructure required to provide these services is the upstream market while the provision of mobile payment services is the downstream market. A firm present in both the upstream and the downstream market is the vertically integrated entity. It can be an MNO or a bank, depending on the infrastructure being considered.⁷
5. Foreclosure of competitors may result in harm to competition and consumers depending on conditions in the mobile payments market. In some markets, despite foreclosure, competition between mobile payment platforms of the infrastructure owners (MNOs or banks) can result in competitive outcomes. In other markets, foreclosure through infrastructure access issues can result in significant market power in the mobile payments market. This could lead to anti-competitive outcomes for consumers. In such situations regulatory intervention may be necessary.
6. Therefore, it is important to understand if, and when, infrastructure access issues can reduce competition in the mobile payments market. We present our findings on this issue based on analysis of information obtained from over 40 interviews with various stakeholders, including MNOs, banks, regulators, and other third parties and industry experts spanning across 18 countries.⁸
 - 6.1. It should be noted that, while this research considered competition issues related to communication channels of MNOs and ATM networks and cash management facilities of banks, the remainder of the report focuses on access to USSD because access to bank infrastructure (in this context) is unlikely to be a competition problem due to available alternatives (see Appendix 4).
7. Our findings on the impact on competition from infrastructure access issues are as follows:
 - 7.1. USSD access in mobile payments has been an issue in several countries. (Section 2.1)

⁵ For example, a broadcaster of television content may own rights to critical television content and may also own television distribution entities such as cable operators. If the broadcaster refuses to supply this critical content to rival television distributors, this could result in consumers choosing the distribution entity owned by the broadcaster where the critical content is available. This can lead to foreclosure of the rival cable operators.

⁶ The situation described is referred to as “input foreclosure.” There is another type of vertical foreclosure possible, where a firm with market power in the downstream market refuses to purchase from its upstream competitors—which similarly leads to harm to the competition in the upstream market. This possibility is referred to as “customer foreclosure.”

⁷ As there are economies of scale for the MPO, it is important that it reaches a critical mass such that its platform becomes financially viable. In situations where issues in accessing critical infrastructure limit the growth of an MPO such that it is unable to become financially viable, this would lead to its foreclosure from the market.

⁸ A list of organizations interviewed is presented in Appendix 1.

- 7.2. Denial of USSD access by MNOs to third-party MPOs can result in foreclosure of third-party MPOs. (Section 2.2)
 - 7.2.1. MPOs do not currently have effective alternatives for USSD. In the future internet may replace USSD but one cannot predict when this will happen. (Section 2.2.1)
 - 7.2.2. Sufficiently large MNO(s) can foreclose third-party MPOs by denying access. (Section 2.2.2)
 - 7.2.3. MNOs can have a strategic motivation to deny USSD access to competing third-party MPOs. (Section 2.2.3)
- 7.3. Even if access is given, high USSD prices charged by an MNO to third-party MPOs can result in their foreclosure. (Section 2.3)
- 7.4. It is unclear if selective degradation of the quality of infrastructure resulting in foreclosure can happen. (Section 2.4)
- 7.5. A market-specific analysis is needed to determine the impact of foreclosure on competition. (Section 2.5)
8. Where USSD access is a competition issue, appropriate regulatory intervention is important for the continued and robust growth of mobile payment services. Given that this is a relatively new service in most countries, there may be lack of clarity and consensus on which regulator is best suited to intervene given differences in the expertise and jurisdiction of regulators. Further, to the extent that intervention is warranted, another important question relates to the appropriate remedy that promotes and preserves competition, and also leads to the most efficient outcome.
9. Our recommendations and findings on regulatory interventions needed to preserve competition in the mobile payments market are as follows:
 - 9.1. Coordination between regulators may be necessary to tackle possibility of anti-competitive behavior given the differences in approaches of regulators. (Section 3.1)
 - 9.2. Banning MNOs from mobile payments market to tackle nonprovision of USSD access may be counterproductive and sometimes ineffectual. (Section 3.2.1)
 - 9.3. An appropriate remedy for nonprovision of USSD access could be rules mandating access provided the risk of reduced investment in USSD by MNOs is low. The telecommunications regulator may be in the best position to intervene while competition and financial regulators may also act in certain cases. (Section 3.2.2)
 - 9.4. Price regulation should be used only when there is a substantial risk of exclusion of MPOs due to high price of USSD access. Simple rules for price regulation may be easier to implement. While such rules could be placed by any regulator depending on market circumstances, the telecommunication regulator is likely to be best placed to do so. (Section 3.2.3)
 - 9.5. If quality can be selectively degraded by the MNO to exclude competitors, the regulator may consider mandating quality standards. One measure could be to put a cap on the proportion of dropped USSD sessions. (Section 3.2.4)

10. In addition, Appendix 2 presents a background discussion on mobile payments and related issues focusing on several key introductory concepts such as the use of mobile payments, the relevant infrastructure, and the general business model of an MPO.

2. Impact of Infrastructure Access Issues on Competition

2.1. USSD Access for Mobile Payments Has Been an Issue in Several Countries

11. USSD access for provision of mobile payment services has been noted as a problematic issue in several countries. This has been in the form of nonprovision of USSD access, high access price, or allegations of degradation of quality of USSD sessions by MNOs.

Nonprovision of USSD access

12. Nonprovision of USSD access by the MNO(s) to third-party MPOs (i.e., MPOs who do not own the USSD channel) appears to be happening in many countries and has played out in different ways. One set of complaints of denial of USSD access have been directed at the largest MNOs of a country. As discussed in detail later, the large MNOs could be of particular importance to third-party MPOs. Thus the denial of USSD access by large MNOs could affect the business of third-party MPOs significantly.

Box 1: Large MNOs denying USSD access

Telecommunications markets vary across countries in terms of market structure. While in some countries several MNOs provide services to customers with no single dominant provider, in other countries one MNO has a large market share relative to its competitors. In several countries where the latter situation prevails, third-party MPOs have complained of denial of USSD access by the largest MNO:

- *Senegal*: There are three MNOs in Senegal. Some third-party MPOs have allegedly been refused USSD access by the largest MNO, which has around 58 percent market share.
- *Zimbabwe*: There are three MNOs in Zimbabwe.^a Banks have accused the largest MNO, which has a market share of over 70 percent^b and also owns a mobile payment scheme, of not providing banks access to its USSD channel.^c The other MNOs in Zimbabwe provide USSD access for free to banks. Recently after discussions with the regulators, the MNO has agreed to provide USSD access to banks. According to our interviews, some stakeholders argued this move will lead to greater competition.
- *Uganda*: There are seven MNOs operating in Uganda.^d A third-party payment service provider has complained that the largest MNO with a share of 52.5 percent^e has denied it USSD access.

a. Econet Wireless, Telecel Zimbabwe and TelOne.

http://www.africatelecomsnews.com/Operators_Regulators/List_of_African_fixed_and_mobile_telcos_Zimbabwe.shtml.

b. <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/EcoCash-Zimbabwe.pdf>

c. <http://en.africatime.com/zimbabwe/articles/e-cash-system-riles-zimbabwes-banks>

d.

http://www.africatelecomsnews.com/Operators_Regulators/List_of_African_fixed_and_mobile_telcos_Uganda.shtml#Uganda

e. <http://www.mtn.co.ug/About-MTN/News-Room/2013/March/MTN-Celebrates-Strong-Results.aspx>

13. In some other countries, MNOs have given USSD access only to those banks that are in a partnership with the MNO for provision of mobile payment services, and not to other banks. In Pakistan, there are five major MNOs,⁹ with no single MNO having a dominant

⁹ <http://www.cgap.org/sites/default/files/CGAP-Technology-Program-Country-Note-Pakistan-Apr-2011.pdf>, p. 8.

market share. These MNOs offer mobile payment services via joint ventures with a bank (or typically microfinance banks). In general, the MNOs are unwilling to give USSD access to any bank other than the partner bank. However, recently some of the relatively smaller MNOs have started talks with banks to provide USSD access to nonpartner banks, with Warid and HBL recently agreeing to a strategic alliance whereby Warid will provide USSD access for the HBL Express product.¹⁰ In the Philippines, there are only two major MNOs, SMART and Globe, and they have their own mobile payment services. Globe also provides USSD to a third party named BankO, which is partly owned by Globe. Similarly SMART owns 40 percent of the shares in mBank and is providing it with USSD access. Our interviews indicated that other banks are unlikely to get USSD access from the MNOs in the Philippines.

14. In countries where USSD access has been provided by MNOs for mobile payment services, regulations seem to play a big role in driving their decision. In some countries, such as Kenya and Rwanda, regulations ensuring access exist. In other countries, such as Nigeria, Bangladesh, and Indonesia, regulations limit the role played by MNOs in the mobile payments market by either banning MNOs from the market or imposing other restrictions on MNOs. In Bangladesh, Colombia, Nigeria, and Mexico, MNOs are prevented from directly providing mobile payments,¹¹ while in Indonesia there are various restrictions on MNOs in terms of offering mobile payment services (Box 5).
15. Two exceptions to the access issue are Tanzania and South Africa, where USSD access is being voluntarily provided. Market structure and fear of regulatory sanctions could explain this.

¹⁰ State Bank of Pakistan. Branchless Banking Newsletter, Issue 8, April- June 2013; <http://propakistani.pk/2013/09/13/warid-gets-contract-for-provision-of-ussd-channel-for-hbl-branchless-banking/>.

¹¹ In Columbia, despite the ban, complaints of nonprovision of USSD access by MNOs have been noted by stakeholders. In Mexico, while MNOs are banned from mobile payment services, they sometimes have joint ventures with banks for such services.

Box 2: Voluntary provision of USSD access in South Africa and Tanzania^a

South Africa

In South Africa, the MNOs provide USSD access to all third parties via the Wireless Applications Service Providers' Association (WASPA), which was established in 2004.^b The third parties are not limited to MPOs but also include other service providers. The MNOs now require that these third parties become a member of WASPA, which is a self-regulating body for mobile-based value-added service providers. Members of WASPA are entitled to USSD access from the MNOs at a nondiscriminatory rate.^c Note that in South Africa USSD was a commercialized communications channel, for example, for the sale of airtime and ringtones, even before the introduction of mobile payment services.

Tanzania

MNOs are understood to have opened USSD to third parties in Tanzania. One possible explanation for this, as noted by the stakeholders, is the relatively competitive environment between MNOs. There are six MNOs active in Tanzania, and while Vodacom leads the market with a 37 percent market share, other operators such as Airtel (market share of 32 percent) and Tigo (market share of 23 percent) are similarly placed.^d

a. Stakeholder Interviews.

b. <http://www.waspa.org.za/>

c. Sometimes different prices are being charged for different service levels of USSD. However, the price for a particular service level remains the same for all users.

d. <http://www.tcra.go.tz/images/documents/telecommunication/telecomStatsDec13.pdf>

Complaints of high USSD price

16. In some countries where USSD access is provided, complaints of high USSD prices have surfaced. The MPOs in these countries allege that the high USSD price acts as a barrier in their ability to attract customers who can often be price sensitive. For example, these complaints have been noted in Kenya and in Nigeria. Note the MNOs in Nigeria contest that the price is too high and believe it is in line with their costs. Even when the MNOs charge for USSD access as a share of the MPO's transaction revenue, rather than a fixed price, this share can be high. For example, our interviewees have indicated that in Bangladesh, an MNO's revenue share for USSD varies from 7 percent to 25 percent of the MPO's revenues, and we understand that MNOs have sometimes charged up to 50 percent of revenue.

Complaints of poor USSD quality

17. The quality of USSD access has been another issue raised by stakeholders in our interviews. The main quality issue is session drop outs. Session drop outs refers to a situation where a USSD session ends without completion of the transaction. The main reason why session drop outs are important is because they could result in increasing the cost of accessing mobile payments for customers, which can accentuate the problems of high price, noted above. As MNOs typically charge a USSD access fee for the dropped sessions, a large proportion of dropped sessions effectively raise the cost of using mobile payment services. Another impact of poor USSD quality could be in terms of negatively impacting the customer experience and thus reduced trust in and demand for the services of third-party MPOs.

18. Session drops have been an issue in some countries, such as Kenya and the Philippines. Further stakeholders in countries like Rwanda and Indonesia fear quality could be a real issue in the future.

Box 3: Complaints of high price and poor quality in Kenya

Some MPOs claim that Safaricom, which is the largest MNO in Kenya, is charging customers of rival MPOs around 4 to 5 Kenyan Shillings for a USSD session while not charging customers anything for the communication channel used for its own mobile payment service, M-PESA. It has been alleged that this price can be a high proportion of the total value of a transaction, especially for low-value transactions. For example, for a customer buying airtime worth 20–40 Kenyan Shillings, a charge of 4 to 5 Kenyan Shillings for a USSD session could be a deterrent to performing the transaction via the mobile payment services of M-PESA's rival MPOs. This can discourage customers from using rival MPO platforms especially if customers of these MPOs are price sensitive.

This problem is allegedly accentuated by the poor quality of USSD. MPOs claim that up to 40 percent of sessions are dropped. Thus, if Safaricom is charging 4–5 Kenyan Shillings for a USSD session, because of dropped sessions, the effective price can increase to around 6–7 Kenyan Shillings (see table in Appendix 2 with USSD prices in select countries)..

In assessing these allegations, however, it is important to note that (i) Safaricom uses SIM Toolkit (STK) technology together with SMS, hence making it difficult to compare the price or quality of the communication channel with those of other MPOs using different channels, and (ii) depending on how the systems of the rival MPOs are set up, there could be a number of potential failure points in a USSD session, not all of which are necessarily Safaricom's responsibility.

2.2. Denial of USSD Access by an MNO Can Result in Foreclosure of a Third-Party MPO

19. Denial of USSD access by MNOs can result in foreclosure of third-party MPOs from the mobile payments market. This is because MPOs do not have effective substitutes for USSD to reach their target customers, at least in the short to medium term. If sufficiently large MNO(s) deny an MPO USSD access such that the MPO is unable to reach enough customers to build a financially viable platform, it would result in the MPO's foreclosure. MNOs can also benefit from foreclosure in some situations and, therefore, may be motivated to deny USSD access. These issues are discussed further below.

2.2.1. MPOs currently do not have effective substitute channels for USSD

20. Most stakeholders (MNOs and non-MNOs) believe that USSD access is important for MPOs. In fact, some MNOs have agreed that not having USSD access can harm a bank's business. While mobile payment transactions can be done over several communication channels that are commercially available from MNOs, such as Short Messaging Service (SMS), Interactive Voice Response (IVR), and the internet,¹² and these channels are being used in some countries,¹³ USSD can be of critical importance to MPOs, as discussed below.

21. An MPO's choice of the communications channel to be used for provision of mobile payment service depends on factors such as reach in the target customer base, cost of

¹² Refer to brief discussion on USSD, SMS, IVR, STK and the internet in Appendix 2.

¹³ For example, despite USSD access, many banks in Mexico are using alternative communication channels to USSD. However, based on interviews with stakeholders, it appears that the reliance on SMS was, at least partly, due to difficulty in getting USSD access. Further, the market segment using USSD is a growing proportion of the total.

channel access, security of the communication related to the financial transaction, and functionality in terms of reliability, speed, ease of interface, etc.

22. In terms of the above parameters, the advantages of USSD as a communications channel for provision of mobile payment services are well understood as it is cost-effective, has interactive features that work on all GSM phones, and is relatively secure.¹⁴ It is often considered to be superior to SMS, IVR, and internet as explained in Table 1.

Table 1: Comparison of alternative channels for mobile payments with USSD

Alternative channel	Reach (handsets)	Cost	Security	Functionality
SMS	Similar to USSD	Typically more expensive than USSD ^a	Less secure	USSD has better functionality
IVR	Similar to USSD	May be more expensive as is often used in conjunction with other technology, such as SMS.	Similar	Depends on consumer preference and whether used with other technology such as SMS.
Internet	Limited reach in the low income consumer segment	Depends on mobile data costs. Mobile phones with access to internet are more expensive.	More secure	Better functionality than USSD

a. It is worth noting that this is not the case in every market, including due to different pricing strategies of MNOs in different markets and the existence, or lack thereof, of a market for USSD beyond mobile payments.

Sources: (1) J. Sanganagouda. Aricent. *USSD: A Communication technology to potentially oust SMS dependency*. A White paper. Available at http://www.aricent.com/files/pdf/Aricent_WhitePaper_USSD_0911.pdf. (2) Key Issues in branchless and mobile banking. CGAP presentation. October 2012. (3) TRAI. *Consultative Paper on USSD-based Mobile Banking Services for Financial Inclusion*. (4) Stakeholder Interviews

23. Another option being used is STK; however, STK still relies on a communication channel such as USSD and SMS. The benefit of STK is that it can make SMS more secure. However, STK is not easily available to third-party MPOs. STK access requires an agreement between MPOs and MNOs, as for USSD access, and in a situation where USSD access is not being provided by MNOs to MPOs, STK is unlikely to be a viable substitute for them. In addition, STK may require customers to swap their SIMs (as was the case with M-PESA in Kenya).¹⁵

In the future Internet may replace USSD

24. While SMS and IVR may be ineffective substitutes for USSD due to their cost, security, or functionality disadvantage, the internet is not an effective substitute for USSD because of its current inability to reach low-income consumers, as data connectivity is available only on relatively costlier smartphones.^{16,17}

¹⁴ J. Sanganagouda. Aricent. *USSD: A Communication technology to potentially oust SMS dependency*. A White paper. Available at http://www.aricent.com/files/pdf/Aricent_WhitePaper_USSD_0911.pdf

¹⁵ GSMA, Mobile Money for the Unbanked, March 2009, *What Makes a Successful Mobile Money Implementation? Learnings from M-PESA in Kenya and Tanzania*. <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/What-makes-a-successful-mobile-money-implementation.pdf>

¹⁶ Defined as phones that can be used to access the internet.

25. In the future, as smartphone costs continue to decrease and penetration becomes sufficiently high, it is possible that MPOs are able to build a critical mass of customers using smartphones to achieve viability in mobile payments using an internet-based mobile payment service. Several stakeholders have acknowledged this possibility. Thus, while the internet may not be a substitute for USSD currently, and perhaps even in the medium term, it is likely that at some point in the future, growth of internet-based mobile payment services reduces an MPO's need for USSD. The number of years this may take to happen, however, is difficult to predict. At that point, the internet may be an effective substitute for USSD, and competition in the mobile payments market may be preserved by using internet-based mobile payment services.
26. However, even in such a situation, financial inclusion could be limited because of the higher costs of data services in rural areas in some countries. It was also argued by a stakeholder that once an MPO is able to dominate the mobile payment market using USSD, and if it remains a closed network,¹⁸ its position can become difficult to replicate even with internet replacing USSD. This is because the customers may not want to leave the larger platform for a smaller platform because of the benefits of belonging to a larger network (such as lower costs for transactions with customers on the same network).
27. USSD's unique position is also reflected in the widespread usage of USSD by MPOs. In fact, we have found only a few examples where MPOs are using alternate communications channels in response to nonprovision of USSD access. Further, it is suggested by stakeholders that these models were viable due to specific circumstances and may not be replicable in all situations. This implies that USSD access will be important to most MPOs.

¹⁷ It is worth noting that MPOs often offer both USSD- and internet-based mobile payment services to cater to a heterogeneous customer set.

¹⁸ Closed network in this context refers to a mobile payments platform that does not allow its customers to transfer money to accounts on other platforms.

Box 4: Use of alternative channels to USSD by MPOs

UBL Bank, Pakistan

UBL was the first major bank in Pakistan to commercialize branchless banking on a large scale. UBL developed its own in-house technology and distribution infrastructure in terms of an agent network, and structured its business to be MNO agnostic. UBL uses a combination of mobile phone apps, SMS, and IVR in the following way:

- UBL has provided its agents with app-enabled phones such that they can make transactions on behalf of customers using mobile apps (the over-the-counter [OTC] model).
- Customers can also initiate transactions themselves via SMS, which is then confirmed through an IVR call.^a

HBL Bank, Pakistan

HBL has entered the market by setting up an agent network and providing its agents with app-enabled phones. This is similar to UBL.

According to some stakeholders in Pakistan, HBL and UBL's success in the market would be very difficult to replicate by other banks. For example, UBL is understood to have received international aid for setting up its mobile payment service. HBL is the largest bank in Pakistan and therefore has had the financial ability to undertake extra investment. UBL's and HBL's model of providing app-enabled mobile phones to agents has been regarded by some stakeholders as an expensive proposition in terms of the investment made in the equipment that is likely to increase the costs for providing mobile payment services.

Ferlo, Senegal

Ferlo is a mobile payment service that has been operational in Senegal since 2005. This service promotes the "branchless banking" model via mobile phones and cards. Ferlo has developed its payment service through IVR for which there are no infrastructure access issues. Ferlo is understood to be having no difficulties in using IVR instead of USSD.

a. Using the term IVR could be misleading in this context. After the transaction is initiated using SMS, the personal identification number (PIN) is entered (using the phone keypad) during a voice call from a pre-specified number. So there is no "voice response" as such.

2.2.2. Sufficiently large MNO(s) can foreclose third-party MPOs by denying access

28. Denial of USSD access by an MNO does not necessarily lead to foreclosure of the MPO from the mobile payments market if other MNOs provide USSD access allowing the MPO to reach a sufficient number of customers. A third party may be able to operate a mobile payment service even if it has USSD access from some MNOs or even one MNO. For example BankO and mBank, which provide saving, loan, and insurance products that can be accessed via mobile phones in the Philippines, receive USSD access from only Globe Telecom and Smart Communications, respectively. Thus, the possibility of foreclosure depends on the presence of other providers of USSD access, i.e., on how the telecommunications market is structured.
29. The extent to which an MPO is affected by denial of USSD access by an MNO depends on the market share of the MNO in the telecommunications market. The MNO with a greater market share will have greater market power to foreclose competitors by refusing access to USSD. Nonprovision of USSD by an MNO with a greater market share will result in a greater impact on the ability of the MPO to reach a sufficient number of

customers to be financially viable. As the MPO faces significant economies of scale due to upfront costs, it is possible that the MNO's market share could be so large that its refusal to provide USSD access is enough to result in foreclosure of third-party MPOs. As depicted in Figure 1, suppose there are two MNOs in a market, A and B, each with its own MPO. Additionally, there is also a third-party MPO in the market. While MNO B provides USSD access to the third-party MPO, MNO A doesn't. If MNO A has a sufficiently large market share in the telecommunications market, it is possible that the third-party MPO is foreclosed despite having access to customers of MNO B. As noted above, there have been many complaints about the MNO with the largest market share in the telecommunications markets in different countries denying USSD access to third-party MPOs. Whether their market share is sufficiently large to result in foreclosure of the MPOs from the market can be assessed in a market-specific inquiry.

Figure 1: Graphical depiction of choices to consumers when USSD access is either denied or provided



Source: Genesis

30. On the other hand, competition among MNOs may result in USSD access being provided to MPOs if no single MNO is large enough to foreclose an MPO. Even if a certain MNO denies USSD access to the MPO, it would not be foreclosed from the market if other MNOs are providing access (although it may still be foreclosed from the particular MNO's customers). For example, in Figure 1, if MNO A and MNO B have similar market shares in the telecommunications market, the third-party MPO can potentially survive by accessing customers of MNO B alone. In this scenario, it is possible that to access the services of the third-party MPO, customers start to switch from MNO A to MNO B. This creates a competitive constraint on the MNO, resulting in an incentive to provide USSD access to the third-party MPO. Note that this depends on the extent of consumer willingness to switch if the third-party MPO's service is not available.¹⁹ The situation in Tanzania is

¹⁹ This type of scenario is more likely to develop once the mobile payment service is already successful. For example, if bKash in Bangladesh continues to grow at the same rate, MNO customers might over time start to demand access to bKash from their MNO. This type of dynamic could start to shift the power in the USSD price/revenue share negotiations.

consistent with this scenario—the telecommunications market is relatively competitively structured, and all MNOs are willingly providing USSD access to MPOs.

31. It is also important to note that foreclosure may happen even in countries where the telecommunications market is competitively structured if all, or most, MNOs deny USSD access to third-party MPOs. For example, in Pakistan and the Philippines several MNOs do not provide USSD access to third parties.

2.2.3. MNOs can have a strategic motivation to deny USSD access

32. Given USSD's importance to MPOs, MNOs may have an incentive to deny access such that it leads to foreclosure of rival MPOs. As discussed above, MNOs have denied USSD access in several countries. In our interviews, some MNOs have admitted that they have denied USSD access to banks because banks are their direct competitors. They also agreed that their denial may be an impediment to fair competition in the market. This clearly implies that, at least in some countries, MNOs intend to foreclose competitors. There are instances where MNOs are giving USSD access to banks for their mobile banking services (where MNOs and banks do not compete) but not for mobile payment services (in Pakistan, Ufone offers USSD access to commercial banks for their existing banking customers through Upayments). MNOs are also sharing USSD with banks that are partly owned by them (as is the case in the Philippines). This suggests that in some countries MNOs may be denying access to their rivals for products in which they compete.
33. Theoretically, whether it is in the interest of the MNOs to deny USSD access to third parties or open USSD access depends on the gain from each strategy:
34. *Gain from denial of USSD access.*
 - 34.1. *Gain in the mobile payments market.* An MNO could provide mobile payments as a value-added service to its customers, which creates another source of revenue. If the MNO denies USSD access to third parties, it gains market share in the mobile payments market, and therefore revenue and profits, which may have otherwise gone to the third party.
 - 34.2. *Gain in the telecommunications market.* If an MNO is offering an attractive mobile payment service, this may make a consumer join its mobile network. Once a customer is on the mobile payment platform of an MNO, it has less incentive to migrate to a rival MNO's network where the platform the customer is on, is not available.
 - 34.2.1. One reason consumers may stick with the payment service of a given MNO is because of "network effects." This refers to a situation where customers prefer being on a larger network as compared to a smaller one because a larger network gives them greater value. Under certain conditions,²⁰ money transfer is easier, and potentially cheaper, if a consumer is part of a dominant mobile payment platform, i.e., one with the

²⁰ If mobile payment platforms are not interoperable, customers are unable to directly transfer money to mobile accounts of another MPO. It is often possible that the recipient is able to get cash from an agent of the MPO of the sender. However, in general, a money transfer is more expensive for customers if it is made to a different platform or if the recipient takes cash from an agent, than if the money transfer is made within the platform.

largest network because then it is more likely that recipients of transfers from a consumer are on the same platform. By foreclosing third-party MPOs (if it has sufficient market power), an MNO could build a dominant payment platform, and as a result, the consumer would also want to be on the MNO's network. These network effects may result in creation of dominant positions in the telecommunications market. The MNO may foreclose other MPOs to benefit from greater market power to price higher in the telecommunications market as customers will be less likely to switch to rival MNOs.

35. *Gain from provision of USSD access.*

35.1. *Gain from mobile payments market.* MNOs benefit from giving USSD access to third parties in terms of additional revenue generated by the sale of USSD access to competing MPOs. This happens where the competing MPOs can generate a large enough volume of transactions, for example, if the MNO itself is limited in providing mobile payments service.

35.2. *Gain in telecommunications market.* If a third-party MPO's service can attract customers, an MNO may benefit from giving USSD access to the MPO as it could lead to customers of the rival MNOs switching to its network.

36. Thus, the incentive to open USSD access will be greater when there are limitations on the ability of MNOs to earn revenue from the mobile payments market itself. If an MNO is banned from the mobile payments market, the only revenue it can earn from the USSD infrastructure is by selling access, resulting in greater incentive to open USSD access.²¹ Some of these issues have played out in Indonesia.

²¹ It is worth noting that this is true only if the MNO believes the ban on entry into the mobile payments market is permanent. This is expanded on in section 3.2.1.

Box 5: Provision of USSD access in Indonesia

Indonesia is an example of a country where limitations on MNOs is playing a role in the decision of MNOs to give USSD access.

In Indonesia, all MNOs are providing mobile payment services and are currently sharing USSD with banks that offer similar mobile payment services. One of the reasons for this is that the MNOs' mobile payment businesses have not achieved the desired growth, even though they have been in that business for some time. This is, at least partly, due to the fact that they are subject to regulatory restrictions such as those on the total amount of e-money that can be put in an account and ownership of CICO agents. The first restriction reduces the usability of their service to higher-income individuals, and the second restriction limits the growth of CICO agents for the MNOs, which is a key factor for success for a mobile payment service.

Faced with such restrictions, Indonesian consumers prefer bank's mobile payment services to MNOs' services as the banks are not subject to the above restrictions. By providing banks with USSD access, MNOs were looking for an alternate source of revenue growth in the form of USSD fees, as they faced slow growth in their own mobile payment businesses. Further, initially some smaller MNOs provided USSD access to banks to also help reduce customer churn.

As a result all major MNOs share their USSD with the banks. Further, because of competition between MNOs, the price at which USSD is available to banks is quite low, and in some situations, the MNOs are offering USSD for free.

Nonstrategic motivation

37. There could be other justifications for MNOs not providing USSD; these are listed below.

Lack of billing facilities

38. As USSD was previously not considered a commercial opportunity by MNOs in several markets, lack of billing facilities may be a reason as to why the MNOs do not provide USSD access to third parties, according to our interviews. Even if their own payment platform is USSD based, MNOs may not be charging a separate USSD fee to customers.

39. However, this explanation is valid only in the short run, and even then there are alternatives available for MNOs in the form of third-party aggregators or USSD gateway operators (such as Concurrent South Africa) who may undertake the necessary investment to create billing facilities.²² Further, a revenue sharing model between the MNO and the third-party MPOs may be adopted in cases where billing facilities by the MNO are not fully developed.

Congestion on MNO's network

40. An argument made for not giving USSD access is that MNOs fear that, by opening their USSD channel, USSD traffic may increase substantially and will affect the network's provision of other services. The congestion due to increased USSD traffic could lead to cannibalization of SMS or voice revenues.

²² Telecom Regulatory Authority of India. 20 September 2013. *Consultation Paper on USSD-based Mobile Banking Services for Financial Inclusion*.p. 17.

41. However, this is possible only if MNOs are constrained in terms of network capacity. If there is sufficient spare capacity, then it is unlikely that an increase in USSD traffic would lead to any cannibalization of voice or SMS revenue. Moreover the increase in USSD traffic would be gradual, increasing as the mobile payment service gains popularity. This could give the MNOs enough time to plan further investments in their network, according to our interviews. Capacity constraints are not an issue in many countries, as indicated by our interviewees, and no MNO we interviewed has said that they are currently affected by this situation, but this argument could be further examined by the relevant regulator on a case-by-case basis.

2.3. MNO May Charge a High USSD Price Resulting in Foreclosure

42. As the cost of accessing USSD can be a significant proportion of total revenues for an MPO, a high and discriminatory USSD access price, as compared to that charged by the MNO to its own payments platform, charged to third-party MPOs can affect their business by raising costs. If the MPO passes on these costs to the consumers (or if USSD price is charged directly to the customer), the difference in price for mobile payment services offered by the MNO's own platform and those offered by third-party MPOs can become an impediment for the latter to attract customers. Thus even if an MNO is mandated to provide access, it may charge a high USSD price such that the third-party MPOs are foreclosed or marginalized in the market.
43. The likelihood of excessive and/or discriminatory prices for USSD depends on the market power in the hands of the MNOs since there is no effective substitute for USSD. The market power of MNOs is potentially constrained by the competition between them in the telecommunications market as was discussed earlier in the context of denial of USSD access. An MNO may be constrained in charging a higher USSD price than that charged by rival MNOs because of the risk of the customer switching to the rival MNOs for its lower-priced mobile payment services, everything else being the same. The switching depends on the importance of mobile payments in the decision of consumers to join a telecommunications network and also on alternative MNOs available.
44. An MNO with a larger share in the telecommunications market may have the market power to price higher, and thus foreclose third-party MPOs, since its USSD can provide third-party MPOs access to a larger customer base. In Bangladesh, where MNOs give USSD access to banks, there are bilateral revenue sharing agreements between MNOs and banks. Our interviewees indicated that the largest MNO is able to negotiate better deals in such agreements, which has sometimes resulted in their revenue share being more than three times higher than the revenue share of the smallest MNO.
45. The impact of competition between MNOs on USSD price can be observed by comparing the USSD pricing outcome in different countries. For example, one could compare pricing in Kenya and Rwanda as USSD access is mandated in both countries.
- 45.1. *Kenya.* Stakeholders have complained of the price of USSD being too high in Kenya. A large part of the Kenyan MNO market is captured by Safaricom, which has around 68 percent market share, and it is likely that it has market power relative to other MNOs who have much smaller market shares.²³

²³ http://www.cck.go.ke/resc/downloads/Sector_Statistics_Report_Q2_201314.pdf

- 45.2. *Rwanda.* Non-MNO stakeholders believe that USSD prices are not very high in Rwanda, and that it was possible for prices to reduce further due to market forces as transaction volumes increase. Rwanda is also perceived to be a more competitive telecommunications market by some stakeholders (MTN has approximately 57 percent market share and Tigo has 30 percent market share in the telecommunications market). It is possible that competition between these MNOs plays a role in lower USSD prices.
46. Similarly, some stakeholders in the Philippines told us that they believed that if USSD access were mandated, then prices would be competitive due to competition between MNOs.
47. A competitive MNO market structure can result in lower prices even without mandatory access. As aforementioned, this is the case in Tanzania, where we understand that the MNOs are all charging a similar price for USSD that is low enough to not be a barrier for third-party MPOs to operate. There have been no complaints regarding USSD access or price until now. Some of our interviewees felt this is largely a result of banks being able to bring the USSD access prices down through individual negotiations based on price charged by the other MNOs.
48. In situations where an MNO charges a high USSD price, a third-party MPO can be foreclosed from the mobile payment market if there are no or an insufficient number of MNOs that provide USSD access at a fair price. Note, while it is less likely, USSD price may be a problem in competitively structured markets as well. This can happen, for example, when MNOs are coordinating to charge a high price.

2.4. Unclear If Selective Degradation of Quality Is Possible

49. Another USSD access issue is USSD session dropouts, which can raise the cost of accessing USSD, be detrimental to the customer experience, and ultimately lead to the foreclosure of third-party MPOs.
50. A key question here is whether MNOs can selectively degrade quality for particular MPOs. If the MNO's mobile payment services are also based on USSD, which they are in most cases, then for quality to be a competition issue, MNOs need to be able to selectively degrade the quality of the USSD given to third-party MPOs without lowering the quality for their own mobile payment platform (or selectively upgrade their own service, for example, by using a dedicated server).
51. There is a difference in opinion across stakeholders as to whether quality can be used as a strategic tool by the MNOs.
- 51.1. On one hand, some MNOs have claimed they cannot selectively control the quality of USSD sessions because USSD is encrypted from origin to termination, and it is not possible to identify the MPO for which the session has been initiated. Hence, MNOs cannot discriminate against third-party MPOs by providing lower quality of USSD or deprioritizing the queries for their mobile payments services. Further, even if it is possible (with sufficient investment), service level agreements should be in place to discourage such behavior.
- 51.2. On the other hand, some non-MNO stakeholders, including telecommunications regulators, have claimed that MNOs likely have the ability to prioritize/deprioritize

sessions for particular USSD users and therefore could target third-party MPOs. It is also believed by some stakeholders that quality should be regulated.

52. Thus, whether quality can be selectively degraded by the MNOs, and if they are doing so, is a factual issue that can be further explored by a regulator in markets where these allegations arise. Note that most stakeholders do not claim that the fault for poor quality of USSD necessarily lies with the MNO, and also acknowledge that quality could be poor due to various reasons, not all of which are within the control of the MNO.²⁴

2.5. Market-Specific Analysis Needed to Assess Impact of Foreclosure on Competition

53. Foreclosure of third-party MPOs—whether from denial of USSD access, high price, or session dropouts—does not necessarily lead to harm to competition and thus harm to consumers. Instead, the regulator needs to conduct a market-specific analysis to assess the harm to competition.

Box 6: Implications of foreclosure on provision of mobile payments services

Foreclosure of third-party MPOs by an MNO implies that the customers of that MNO have only one option of a mobile payments service, namely the service run by the MNO itself. On the other hand, if a third party, for example a bank, was allowed by all MNOs to access their USSD, the customers would have a choice between the mobile payment service of their MNO and the bank's mobile payment service.

While foreclosure leads to a reduction in choices and could potentially influence prices, it does not necessarily affect the services offered to end customers. That is, even if the banks were foreclosed, in a competitive voice market the MNOs could potentially provide most payment services, such as a facility to have a mobile payment account, transfer money, pay utility bills, etc.

However, provision of advanced financial services such as savings, lending, and insurance may get affected if MNOs are not allowed to offer them due to regulatory restrictions. It is possible that foreclosure of banks in the mobile payments market affects the provision of such financial products to customers, and in the extreme case, these services not being provided to the target customer base of the MPOs—the unbanked and the underbanked. This is an important concern as financial inclusion is about more than just payments. Note that even if banks are foreclosed from providing mobile payments services themselves, they can partner with MNOs to provide advanced financial services in the market. This has happened, for example, in Kenya and in the Philippines.

54. The presence of MNOs in the mobile payments market alone may be sufficient for customers to get the desired services at a competitive price.
55. Competition between mobile payments platforms run by different MNOs could result in competitive outcomes in the mobile payments market even if non-MNO players are not present. A high USSD price charged by one MNO could result in consumers switching from its mobile payments platform to a rival MNO's platform. To do this, however, the consumer needs to switch its mobile payment account as well as its mobile network. The extent of switching by customers would determine the competitive constraints on MNOs,

²⁴ Sometimes technical issues may arise at the other end of the chain, such as with the aggregator or even at the MPO. In other situations, the design of the USSD session by the MPO may be incompatible with what the MNO could support. This could be in terms of, for example, the character limit for the USSD session or with the session timings. There can be poor quality of USSD in general because of technical issues unrelated to the MNO's potential incentives to foreclose third parties.

and depends on several factors such as the presence of effective substitutes in the form of MNOs that also offer similarly placed mobile payments platforms, importance of mobile payments for customers, stickiness of customers to networks and to payments platforms, etc.

56. Apart from competition between mobile payment platforms of MNOs, the regulator may also consider competition between such MPOs and other traditional financial and payments service provider firms, such as banks. Since such MPOs also compete with banks for certain existing banking customers, MNOs may need to keep the prices of their payments services low, and as a result there may be no consumer harm from foreclosure.²⁵
57. If these competitive constraints are not sufficient, however, foreclosure of third-party MPOs may result in some MNOs gaining market power in the mobile payments market, increasing the implications of anti-competitive behavior. This could potentially lead to higher prices of mobile payments services provided by the dominant players and therefore harm to consumers. In Zimbabwe, a stakeholder argued that denying banks access to USSD had been instrumental in Econet being able to create a dominant mobile payments platform.

Box 7: Potential anti-competitive outcomes in the telecommunications market

Foreclosure in the mobile payments market can also reduce competition in the telecommunications market. By creating a dominant position in the mobile payments market, an MNO could also extend its market power to the telecommunications market. Because of its large size, consumers may stick to the mobile payment platform of the MNO and, therefore, to the telecommunications services of the MNO itself. This results in increased market power to the MNO in the telecommunications market, possibly resulting in anti-competitive outcomes.

Telecommunications markets are an example of markets where network effects exist, as customers may prefer MNOs that are larger. This is because customers of smaller networks are more likely to pay interconnection costs than customers of larger networks (resulting in a higher average cost of calls and SMS). Similarly, through its mobile payments platform, a large MNO may also be able to generate similar network effects, as discussed earlier. In every deployment we are familiar with, a customer's option to transfer money to customers of other MNOs is restricted or is more costly. For this reason, customers are likely to prefer larger networks resulting in consumer stickiness for dominant platforms.

3. **Regulatory Mechanisms to Address Infrastructure Access Issues in the Mobile Payments Markets**

58. Regulatory intervention may be justified based on a market-specific analysis to determine if there is foreclosure and reduced competition in the mobile payments market that is resulting in consumer harm. The following are our findings and recommendations for the appropriate regulatory intervention.

²⁵ Competition from banks may force MPOs to charge a price lower than what banks charge for similar services, as otherwise the MPO may start losing customers to the banks. Whether a bank is truly able to force an MPO to price close to cost depends on the extent to which the banking sector competes for the same customers, and leverages lower cost branchless banking models to offer accessible and affordable products and services (which is not the case in every market).

3.1. Coordination among Regulators Is Necessary

59. Though every country is different in terms of regulatory structure, potentially there can be three relevant regulators for the mobile payments market: the financial regulator (central bank), the telecommunications regulator, and the competition regulator. These regulators differ in terms of objectives, focus, and strengths and thus are suited for intervention in different circumstances.
60. *Objectives and mandates of the regulators.* While a key objective of a financial regulator is to ensure a strong financial system that minimizes financial risks, the telecommunication regulator's objectives include ensuring efficient and competitive functioning of the telecommunications market, with price regulation as a key tool. The competition regulator's objectives are to ensure competition in different sectors of the economy and to eliminate practices that impede competition.
61. *Jurisdiction.* Typically, the competition regulator will have all firms in the economy under its jurisdiction while the jurisdiction of sector regulators is carved out based on sectors. The firms under the jurisdiction of sector regulators tend to be the relevant licensees—licensed MNOs are under the telecommunications regulator and licensed financial institutions, such as banks, are under the financial regulator. In mobile payments, there could be an overlap of jurisdiction between the telecommunications and the financial regulator if the latter also regulates the mobile payment services of MNOs. In Zimbabwe, there is an overlap in the jurisdiction of the telecommunications and the financial regulator. This has led to the signing of a memorandum of understanding between the two regulators to jointly address the relevant issues. In many countries, however, our discussions with regulators indicated that there are situations where the central bank does not have jurisdiction over the MNOs, if it does not license the MNOs for mobile payments.
62. *Basis for assessment.* Even where the jurisdiction of two regulators overlap, there can be significant differences in the way the regulatory bodies approach an issue and the basis for their assessment. For example, typically both the telecommunications and the competition regulator have jurisdiction over the telecommunications sector. However, the basis for assessment is different:
 - 62.1. The competition authority typically works on an ex-post basis, i.e., after the alleged anti-competitive conduct has taken place, and while it can often launch an investigation independently, it may not be constantly monitoring such issues. On the other hand, the telecommunications regulator looks at the issue ex-ante, i.e., whether there is a likelihood of anti-competitive conduct in the market, and intervenes accordingly to maintain or enhance competition.
 - 62.2. The difference can also be in terms of strictness of legal standard for the two regulators to justify intervention. Often, competition authorities face a stricter test of demonstrating abuse of market power which led to harm to competition and consumers to justify regulations on firms, while the telecommunications regulator needs to demonstrate that an intervention would benefit competition in the market. The differing legal standards perhaps reflect the fact that typically competition authorities impose penalties along with remedies while the telecommunication's regulator may not impose penalties.
63. *Powers and processes.* Finally, regulators may differ in terms of powers and processes. These could either be formal or practical limitations in implementing certain remedies. The

competition authority often takes time to come to a decision, and has strong appeal procedures making it less suitable for continuously monitoring prices. Thus, regulation of prices, which requires continuous monitoring, is often left to the sector regulator.

64. Because of these differences, it is important for the financial regulator, the telecommunications regulator and the competition regulator to coordinate on the USSD access issue.

Box 8: Cooperation among regulators on USSD access

Cooperation among regulators is important to effectively tackle USSD access issues. Sometimes the regulator identifying the problem in its market is unable to take the necessary action and relies on another regulator to intervene.

- For example, the financial regulator may identify the potential for anti-competitive behavior in the mobile payments market but may coordinate with the telecommunications regulator to appropriately regulate the MNOs over which it has jurisdiction. This has happened in Bangladesh, where Bangladesh Bank (the central bank) has asked Bangladesh Telecommunication Regulatory Commission (BTRC) to engage after it received complaints of nonprovision of USSD access as well as of USSD price.
- Similarly, the competition regulator may find that the prices charged for USSD by MNOs are excessive or discriminatory leading to corrective regulations being introduced and implemented by the telecommunications regulator.
- In Peru, the financial regulator and the telecommunications regulator have worked together to regulate the actions of MNOs with respect to USSD. These regulations restrict an MNO from charging MPOs, including its own payments platform, discriminatory prices for USSD. While these regulations have been set by the telecommunications regulator, the financial regulator has played a significant role in creating the regulatory framework.
- Similarly in Zimbabwe, the Reserve Bank of Zimbabwe (RBZ) coordinates with the telecommunications regulator on matters of technical information and expertise. In Tanzania also, the financial and the telecommunications regulator cooperate for regulating mobile payments.

3.2. Appropriate Remedy Should Be Least Restrictive, Easily Monitored, and Minimize Harmful Effects

65. The guiding principle for regulation is that the remedy for harmful conduct should be the least restrictive to achieve the intended objective and should be proportionate to the extent of risk. In the context of sharing USSD, a least restrictive rule will be one that minimizes risk of anti-competitive behavior without putting unnecessary restrictions on MNOs. For example, banning MNOs from the mobile payments market is more restrictive than a regulation mandating USSD access. The regulatory rules should be justified by the risk of anti-competitive behavior—the higher the risk, the stricter the rule.
66. Another important criterion for an appropriate remedy is that it should be easy to implement and monitor. The rules should be simple so that they can be easily monitored. For example, regulation of price based on detailed cost considerations can be complex and time consuming to monitor. Instead, if one could use a simple benchmark for prices, such as prices prevalent in adjacent markets, if appropriate, then this results in a much simpler form of price regulation.

67. Potential harmful effects of a remedy should also be considered to minimize unintended consequences. For example, while regulating access to USSD for third parties, it is important to consider if such regulation can affect the incentives for the MNO to make the necessary investments to maintain and update their USSD infrastructure.

3.2.1. **Banning MNOs from mobile payments may be counterproductive and ineffectual**

68. Some countries, such as Nigeria and Bangladesh, have banned MNOs from directly providing mobile payments. If MNOs are banned from providing mobile payments services, they may not have an incentive to deny USSD access to banks and others.

69. However, there can also be significant harm from this measure. As discussed above, through their mobile payment platforms MNOs have emerged as low-cost competitors to banks for the provision of basic financial services. In a number of markets, such as Kenya, Tanzania, Uganda, and Zimbabwe, MNO-led business models already reach more customers than the entire banking sector.^{26,27} Such regulation may result in loss of consumer benefits from competition between MNOs and banks. This could happen since banks may not offer mobile payment services at the low price of mobile payment services of MNOs to avoid cannibalizing their existing banking operations. Consumers also benefit from the participation of MNOs who may price lower than banks for mobile payment services to also benefit in the telecommunications market due to stickiness of consumers, and lower costs of direct airtime distribution via the mobile payments channel. Low-cost branchless business models, together with these additional benefits to the core MNO business, may also allow MNOs to reach into more geographically dispersed areas on a commercially viable basis than banks. For these reasons some stakeholders believe an outright ban on MNOs would not be benefit the market.

70. It is also important to note that sometimes banning MNOs does not even serve the purpose of ensuring access. One reason could be that the MNOs do not believe that the ban on entry in the mobile payments market is permanent and if banks' mobile payments services do not grow as expected, the regulator may eventually allow MNOs in the market.

Box 9: USSD access issues in countries where MNOs are banned from mobile payments market

Banning MNOs from the mobile payments market may not be an effective remedy for the USSD access issue. There are a number of examples where there have been complaints despite a ban on MNOs.

In Bangladesh, some MNOs are refusing to give USSD access to certain banks even though they are providing access to other banks.

Similarly in Nigeria, despite the ban, initially there were complaints about delaying tactics used by the MNOs in providing USSD and now there are complaints relating to the price and quality of USSD. MPOs complain that price can sometimes be many times the price of SMS and has hindered the growth of mobile payment services. However stakeholders observed that more recently the price has been declining, in part thanks to pressure from the regulator.

In Colombia, while MNOs are not currently allowed to offer mobile payments, the telecommunications

²⁶ GSMA Mobile Money for the Unbanked, 2014, *State of the Industry 2013, Mobile Financial Services for the Unbanked*. http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/02/SOTIR_2013.pdf.

²⁷ Note that the data are based on registered customers rather than active customers.

regulator has still felt the need to introduce mandatory access rules for USSD as there have been complaints by banks regarding denial of USSD access.

3.2.2. Telecommunications regulator or others may mandate access to USSD to deal with nonprovision of USSD

71. To the extent that nonprovision of USSD is a competition issue, the appropriate regulatory intervention would be mandating MNOs to give USSD access to anybody who demands it, while not necessarily regulating the price. According to some of our interviewees, some countries, such as Kenya, Rwanda, and Colombia, have placed rules that oblige MNOs to provide access to all third parties, but the price for USSD access has been left to be determined by negotiation between the MNO and the third parties. In Zimbabwe, there exists no regulation requiring MNOs to provide access, but RBZ has reached an understanding with the MNO who had been denying USSD access that access will be provided to all banks that ask for it, according to our discussions with regulators.
72. To ensure implementation of the regulation, the regulator could set up a dispute resolution mechanism that can mediate between those parties that are unable to agree on commercial terms such as the USSD price. In Colombia, the telecommunications regulator has decided to mandate USSD access and introduce a case-by-case resolution of complaints about price and quality, if any. In Peru, as per our discussion with the regulators, the financial and the telecommunications regulators plan to coordinate for this purpose, such that the telecommunications regulator will receive complaints of breach of rules, which will be resolved jointly by the two regulators. In general, dispute resolution is used in several contexts by regulators. For example, the Telecom Disputes Settlement & Appellate Tribunal (TDSAT) set up in India adjudicates disputes among the regulator, the service providers, and the consumers regarding the provision of television broadcasting signals on appropriate terms.²⁸
73. An advantage of a dispute resolution mechanism is that it allows MNOs, banks, and other parties the freedom to negotiate price without regulatory intervention while also allowing regulators to engage with these entities to understand the factors driving USSD price. While not a dispute resolution mechanism, RBZ has constituted a process wherein it will receive monthly updates on the progress of the negotiation process between banks and the MNOs on USSD access, including any disputes. RBZ can intervene if banks and the MNOs disagree. Currently, there are outstanding issues between the largest MNO and some banks in terms of USSD access price. The largest MNO's asking price is currently significantly more than what some banks believe is fair (although others have agreed to pay the proposed price), according to our discussions with regulators. As another example, the Tanzania Communications Regulatory Authority (TCRA) has a dispute resolution committee that resolves disputes or consumer complaints in relation to telecommunications services. According to regulators, this mechanism helps it to resolve disputes between parties such that legal disputes are minimized.

²⁸ See interconnect regulations on television broadcasters in India.²⁹ Note that it is possible that the telecommunications regulator may have jurisdiction over competition issues in the telecommunications services but not over such issues in mobile payments. If true, this would constrain the telecommunications regulator. However, we have not come across an example of this type.

74. The appropriate regulator to implement this remedy, i.e., mandatory access to USSD, is typically the telecommunications regulator.
- 74.1. The regulator will have the jurisdiction over the MNOs. Given the objective of ensuring that the markets in which the MNOs operate is growing and competitive, it has the expertise to continuously monitor the state of the market.
- 74.2. The test for whether or not to intervene for the telecommunications regulator, which is likely to be whether making access mandatory will enhance competition, may also be lower than for the competition authority. The processes for implementing a remedy may also be shorter.²⁹
75. A competition authority may also intervene in the market if there is an instance of denial of USSD access by certain MNOs. The authority could investigate if this conduct leads to vertical foreclosure of third parties and therefore is an “abuse of dominant position.” The test likely to be adopted by the competition authority is whether the denial of USSD access led to harm to competition and to consumers. The competition authorities may need to determine if USSD infrastructure constitutes an “essential facility,” which is a fairly strict legal test. The competition authority may also be limited in its actions in certain situations. For example, if all MNOs are denying USSD access irrespective of their market position, then it may create difficulties for the competition authority to prove that their action constitutes an “abuse of dominant position.” In the absence of a collusive agreement, the competition authority may find it difficult to address the situation.
76. In certain situations, the financial regulator could also implement mandatory provision of USSD. For example, if it grants a licence to an MNO to operate in the mobile payments market, licensing conditions could include sharing of USSD with third-party MPOs. In some situations, financial regulators may have jurisdiction over the mobile-money-related activities of MNOs. While this may not provide jurisdiction for the regulation of nonpayment related activities of the MNO, such as USSD, it can provide room for moral suasion, such as in Zimbabwe.

3.2.3. Simpler rules to regulate price may be set where possible

77. In markets where mandating access to USSD along with a dispute resolution mechanism does not resolve competition issues, i.e., where high USSD price can result in exclusion of third-party MPOs, the regulator may want to regulate price. Instead of setting a regulated price for USSD, the regulator should adopt simple rules on USSD price where possible.
- 77.1. In India, TRAI has perceived USSD price to be a potential issue and has put a price ceiling of around US\$0.02³⁰ per USSD session.³¹ The basis on which the price was set is unclear.
78. Setting a regulated price is a complex process for regulators as it is important to fix the prices at a fair and competitive level to eliminate the risks of excessive and exclusionary USSD prices. However, price regulation also contains risks of distorting the market

²⁹ Note that it is possible that the telecommunications regulator may have jurisdiction over competition issues in the telecommunications services but not over such issues in mobile payments. If true, this would constrain the telecommunications regulator. However, we have not come across an example of this type.

³⁰ Rs. 1.5 per USSD session.

³¹ Telecom Regulatory Authority of India. 26 November 2013. *The Telecommunication Tariff 56th Amendment Order*.

dynamics. Some stakeholders, MNOs, and non-MNOs are not in favor of price regulation as they believe that it may be difficult to ensure that the regulated prices are not too low or too high. Further, the process could be very slow and, therefore, it would not be easy to adjust prices to changes in market dynamics. For these reasons, price regulation could have a distortionary effect in the market. This distortionary effect could skew the development of the market. Further price regulation may not be needed at an early stage in the development of the market, even if USSD prices are high as prices can come down over time with increase in transaction volumes. Thus, intervention by the regulator may be justified only when the intent of MNOs is to exclude competitors.

79. A low regulated price could affect the incentives of MNOs to invest in infrastructure that enables USSD-based mobile payments. This is because MNOs may get a lower return from their investments than what they would get in the absence of the regulation, thereby reducing their incentives to invest. According to some stakeholders, the investment required in USSD for MNOs is low compared to the overall investment made by MNOs in their networks. TRAI notes that the major investment required by the MNOs is the USSD gateway, which can also be provided by third-party gateway operators, and suggests that the investment required for the MNOs is a small, one-time expense.³² On the other hand, some MNOs have claimed that the investment in USSD gateway is very high.³³
80. There are challenges in coming up with a methodology to set USSD prices.
 - 80.1. A test that the economic literature proposes for setting regulatory prices is the Efficient Component Pricing Rule (ECPR). ECPR is used for regulating access price to a bottleneck service: “ECPR specifies that the access fee paid by the rival to the monopolist should be equal to the monopolist’s opportunity costs of providing access, including any forgone revenues from a concomitant reduction in the monopolist’s sales of the complementary component.”³⁴ In the context of USSD infrastructure, ECPR implies that the USSD price charged by MNOs to third parties should be such that it compensates the MNO for direct costs of providing USSD as well as the profits foregone by the MNO by providing USSD to others. These foregone profits are the profits the MNO would have made from its mobile payment service had it not been giving USSD to third-party MPOs. The economic logic behind ECPR is that the USSD access price is sufficiently high to ensure that MNOs do not have any incentive to deny USSD access to third parties.
 - 80.2. There may be practical difficulties in using ECPR to determine USSD access fees. To determine foregone profits, one needs to know the downstream margin that depends on the price for mobile payment services. Mobile payment services consist of several elements, where each element may have a different price and some may not be priced. As a result, there are challenges in implementing ECPR.
 - 80.3. Another option could be to set the USSD access price on the basis of long-run incremental costs (LRIC). This is sometimes used by the regulators for setting interconnection rates as in Tanzania. In the case of interconnection, LRIC can be estimated by allocating a proportion of network operational costs, cost of capital on network assets and depreciation, etc., to the relevant business segment

³² TRAI tariff order. p. 11.

³³ An MNO can recoup its investments from USSD by way of a per-session fee as well as a one-time fee charged to the MPO.

³⁴ <http://www.stern.nyu.edu/networks/95-04.pdf>

(termination). In general, a financial model is used to calculate LRIC by identifying costs associated for a particular service and then a proportion of network costs are added.^{35,36} However, building a model to estimate LRIC could be complex, costly, and time consuming. Note that the Comisión de Regulación de Comunicaciones (CRC), the telecommunications regulator in Colombia, is considering using a LRIC model for USSD pricing. While this will not be used to regulate price, the CRC's objective is to use the model to assist in dispute resolution on USSD prices, according to some regulators we spoke to.

81. Given that many stakeholders do not feel it is appropriate for the regulator to set the USSD price, along with issues of complexity in setting and implementing regulated USSD prices, the regulator may prefer to implement simpler rules on prices that are easy to monitor and adjust.

81.1. One such rule is to mandate MNOs to charge prices in a “nondiscriminatory” fashion. This implies that the MNOs should not charge different USSD prices to different parties. Thus, this rule may force MNOs to charge the same price to MPOs that they charge other nonmobile payments-related third-party players (e.g., for ring tone applications and other value-added services) or to its own downstream entity, which are presumably fair. However, this rule may not work in all situations as in some countries there may be no commercial market for other USSD services. Also, the price charged by the MNO to its downstream entity may be a transfer price and the MNO could then inflate this price as it would not affect its total profits. In Peru, the regulators have implemented this remedy of nondiscriminatory pricing by requiring that the MNO creates a separate entity (e.g., a special-purpose vehicle) through which it provides mobile payments services. This lends more visibility to the implicit price being charged by the MNO to its owned entity, thus making enforcement of the nondiscriminatory pricing regulation easier. This may also help the MNO in developing billing facilities for USSD access, according to regulators.

81.2. Another rule could be to set prices according to a benchmark. An appropriate benchmark would be one that gives sufficient returns to MNOs while also not being too high.

81.2.1. Potentially, this benchmark could be the price charged for SMS or voice. However, some stakeholders have pointed to different technology being used by the other communications channels as a reason why these benchmarks are inappropriate. For example, a stakeholder believes that USSD is a better quality communications channel than SMS and so SMS prices would not be a suitable benchmark for USSD's price.

81.2.2. Benchmarking can also be done based on USSD prices in another market. This could be a market where USSD prices are not considered to be problematic. Annexure 3 provides USSD price data for some countries. Note that benchmarking based on international comparisons may also be

³⁵ There is also another model called the bottom-up model, where costs of a hypothetically efficient network are modeled and it is tested as to how the exclusion of the relevant business segment (termination) may decrease costs. This may be difficult for the regulators to implement.

³⁶ Similarly, for USSD, the access price may be determined on the basis of specific costs that are incurred by the MNO to provide access to third parties (USSD gateway, etc.) along with a proportion of network costs for the MNO. The latter, for example, could be based on the proportion of network capacity allocated to USSD.

subject to criticism due to differences across countries (for example, whether the benchmark should be nominal price in other markets or adjusted to take into account differences in voice or SMS costs).

82. As the above discussion indicates, these simple rules for pricing may not always result in the precise ideal or correct prices, which would be based on detailed analysis of costs. However, these rules may still prevent potential competitive foreclosure resulting from high USSD prices if they result in USSD prices sufficiently close to the ideal prices while also not being below the costs for the MNOs. In such situations, the regulator can consider using them to regulate price. The telecommunications regulator is most appropriately placed to regulate price. The competition authority or the financial regulator could also intervene to set other rules, for example, those enforcing nondiscriminatory prices. For the competition authority this could be part of a ruling on anti-competitive conduct of certain players in the market, while the financial regulator could put this remedy as part of the licencing agreement with the MNO or its mobile payments entity.

3.2.4. Quality standards can be used to ensure quality of service

83. If the regulator believes that the quality of USSD sessions should be regulated, i.e., the degradation of quality can be a competition issue, then it can mandate quality standards for MNOs. It is believed by some stakeholders that this can be done in the form of setting an upper limit for the proportion of dropped sessions. While we have not come across a situation where this has been done by regulators in the context of USSD, the telecommunications regulators in many markets have placed similar regulations for other business segments of the MNOs, such as voice, SMS, etc.

For example, in Rwanda, the Rwanda Utilities Regulatory Agency (RURA) has regulations for mandating quality of service by MNOs.³⁷ Under these regulations, the regulator has set 2 percent as the cap for call drop rates in a quarter. Additionally, the SMS completion ratio has to be above 95 percent. Similar regulations have been put in other countries such as Nigeria and India.³⁸ TCRA has similar quality standard regulations.³⁹ These quality regulations are periodically monitored by the TCRA by way of reports on all the aspects on which standards are regulated. Further, TCRA also gets feedback from consumers to help it assess their experience of the quality. A threshold for quality standards may be developed by the regulator after understanding the technical ability of MNOs to meet them. However, maintaining quality standards close to 90 percent or so would help to reduce costs of accessing USSD to consumers.

4. Conclusion

84. As our research, including interviews with stake holders, has shown, USSD access is an important competition issue in many countries since currently there are no effective substitutes for USSD that have been proven at scale. The importance of regulatory intervention in less competitive markets is therefore clear given the importance of a

³⁷ RURA. Regulations for Quality of Service of cellular mobile and fixed networks services. February 2013.

³⁸ In Nigeria the regulations require, for example, the busy hour call completion rates to be more than or equal to 97 percent while busy hour dropped call rates to be less than 1 percent. In India, the call set-up success rate within the licensees' own network needs to be above 95 percent in a quarter while the call drop rate is 3 percent.

³⁹ For example, the percentage of successfully established calls that are dropped are to be less than 3 percent. See (TCRA. Quality of Service regulations. <http://www.tcra.go.tz/images/documents/regulations/qualityOfService.pdf>)

healthy and growing mobile payments market for financial inclusion, particularly in developing countries.

85. Our report has laid out the issues that are relevant from a regulatory perspective—extent of jurisdiction of different regulatory agencies and the need for coordination among them. In our view, the guiding principle for regulation is that the remedy for harmful conduct should be the least restrictive to achieve the intended objective and should be proportionate to the extent of risk. And this appears to be the principle followed by several regulators who have successfully handled actual or potential anti-competitive outcomes in the mobile payments market. Regulators should consider regulation that not only improves competition but is also efficient and easy to implement. Mandating access if necessary and resorting to price regulation only if foreclosure concerns due to high prices are significant is the appropriate regulatory approach in our view, and also is a view independently expressed by many regulators. Since this is a relatively new market, appropriate regulatory remedies will evolve with regulators benefitting from the ideas and solutions implemented in other jurisdictions.

Appendix 1: List of Stakeholders Interviewed

No.	Institution	Country
1.	Dutch-Bangla Bank	Bangladesh
2.	bKash	Bangladesh
3.	Bangladesh Bank	Bangladesh
4.	ETB	Colombia
5.	Asobancaria	Colombia
6.	CRC	Colombia
7.	Btpn Wow!	Indonesia
8.	Ruma	Indonesia
9.	Telkomsel	Indonesia
10.	Equity Bank	Kenya
11.	Financial Sector Deepening Kenya	Kenya
12.	Kopo Kopo Inc	Kenya
13.	Micromobile	Kenya
14.	CNBV	Mexico
15.	Airtel	Nigeria
16.	First Bank of Nigeria Ltd	Nigeria
17.	Stanbic	Nigeria
18.	Telenor	Norway
19.	HBL Bank	Pakistan
20.	Telenor	Pakistan
21.	UBL Bank	Pakistan
22.	Ufone	Pakistan
23.	SBS	Peru
24.	BankO	Philippines
25.	mBank	Philippines
26.	Ferlo	Senegal
27.	Visa	Singapore
28.	ABSA	South Africa
29.	Concurrent	South Africa
30.	MFS	South Africa
31.	Oltio	South Africa
32.	MTN, South Africa	South Africa
33.	Rorotika, South Africa	South Africa
34.	Tyme Capital, South Africa	South Africa
35.	Vodacom	Tanzania
36.	Tanzania Communications Regulatory Authority	Tanzania
37.	Yo! Uganda	Uganda
38.	GSMA (MMU)	United Kingdom

No.	Institution	Country
39.	Bill & Melinda Gates Foundation	USA
40.	BCEAO	West African Economic and Monetary Union
41.	Reserve bank of Zimbabwe	Zimbabwe

APPENDIX 2: BACKGROUND

Mobile payments and its uses

86. In this paper mobile payments refer to payments and other financial transactions made via a mobile phone from an account or wallet associated with that mobile phone number. Broadly defined, this term can reflect different business models covering a range of financial transactions. For assessing competition issues in the context of infrastructure access, the relevant services are branchless banking services provided via mobile phones where the mobile payment account is independent of the customer's existing bank account. MNOs and banks potentially compete for customers who use payments services based on their mobile payment account. Therefore both of them may have incentives to not give access to their infrastructure to each other.
87. The fact that a fully functional bank account is not needed for mobile payment services helps in extending financial services to the large number of unbanked (and underbanked) customers in developing countries. Banks can also offer their existing customers an additional channel (mobile phones) through which to use their existing bank account, much like internet banking. This is a "value-added" service, often referred to as mobile banking, that banks may offer to their existing customers.
88. The key elements⁴⁰ of a mobile payments system are as follows:
- 88.1. *Account.* The mobile payment account is opened by the user via an agent of the MPO. The accounts can be of the final consumers (mobile wallet) who makes the transaction, or of intermediaries who then use them to provide certain mobile payment services to a consumer by carrying out financial transactions on his behalf (OTC model).⁴¹ In some cases, the MPOs operate both models.
- 88.2. *CICO.* To use the mobile payments services, customers need to deposit money into their mobile money accounts (cash-in), which is then used to make payments. Customers may also want to withdraw money from their accounts (cash-out). For providing these services, an MPO needs to establish a network of CICO points, which can be comprised of either agents or ATMs and bank branches or both.
- 88.3. *Transactions.* The transactions that can be conducted using a mobile payment account include (i) payments for purchase of goods and services⁴² and (ii) transfer of money to another consumer. The transactions can be made either to mobile money accounts on the same MPO (intraplatform), to customers of a different MPO

⁴⁰ Bill & Melinda Gates Foundation. Fighting poverty profitably. September 2013. p. 10.

⁴¹ See <http://www.cgap.org/blog/mobile-money-otc-versus-wallets>

⁴² Such as payment of utility bills, the purchase of airtime, or payment for goods at a retail outlet.

(interplatform), or to unregistered customers on the same or a different MNO network. The transfers across platforms can only happen over interoperable platforms. This requires technical compatibility between the platforms, a mechanism for clearing payments and an interoperability agreement covering other areas relating, for example, to risk and the commercial aspects of the relationship. The MPOs may charge customers higher prices for interplatform payments so as to encourage customers to register with their platform. Currently, most platforms are not interoperable and most of the transactions are within a given platform.⁴³

88.3.1. Note that even when there is no interoperability, interplatform transactions can happen but in a limited way. In such cases, money is merely sent from a customer of one MPO to cash, i.e., the recipient would receive an SMS and would take a PIN to an agent of the MPO of the sender to receive the cash—the customer would need to cash out the full amount.

88.3.2. In the OTC model, for services such as paying utility bills or transferring money, customers can go to the agent with cash and the agent can use its mobile money account to pay the utility bill or transfer money to the required account or phone number on behalf of the customer.

88.4. *Adjacencies.* The fourth and final element of mobile payments is other revenue-supporting activities that are linked to the basic payment system. For example, adjacencies could be in the form of more advanced financial products like savings, insurance, and credit, which can lead to an extension of formal banking services to the customers of mobile payment services. Adjacencies may also include revenue unrelated to financial services such as a lower cost of distributing airtime for MNOs or churn reduction in customers.

89. By enabling currently unbanked/underbanked customers to conduct financial transactions such as payments and transfers and providing access to advanced financial products such as savings, credit, and insurance, a mobile payments platform has the potential to help consumers reduce transaction costs, share and manage risk, manage cash flows and smooth consumption, and ultimately improve the lives of poor and excluded individuals.⁴⁴

Communication channels for mobile payments.

90. A critical component of a mobile payment transaction is the communication between the MPO and its customers over the mobile network. This communication consists of the customers securely sending the relevant instructions to the MPO along with proper authentication, and the MPO sending an appropriate response as well as a confirmation of the transaction, if required. Thus, to complete a mobile payment transaction, an MPO would need access to the mobile communication channel of the customer's mobile network. There are several channels that an MPO could use: USSD, SMS, IVR, STK, or internet:

⁴³ http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/02/SOTIR_2013.pdf

⁴⁴ See Cull, Robert, Tilman Ehrbeck, and Nina Holle. 2014. "Financial Inclusion and Development: Recent Impact Evidence." Focus Note 92. Washington, D.C.: CGAP. <http://www.cgap.org/sites/default/files/FocusNote-Financial-Inclusion-and-Development-April-2014.pdf>

USSD

91. USSD is a mobile communication channel widely used for mobile payment transactions for lower-income customers that may be unbanked. It is a “communication protocol used to send text messages between a mobile phone and applications running on the network.”⁴⁵ For quite some time, USSD was used as a noncommercial communication channel between the MNO and the customers for enquiries related to airtime, as well as for other internal purposes, but its value in facilitating mobile payment services has been increasingly recognized in recent years. An MPO’s customer can initiate a transaction with the MPO by entering the short-code⁴⁶ assigned to that MPO on their mobile phone. In response the customer will receive a menu listing various financial transactions. The customer can then select the relevant option and send the required information to the MPO to execute the desired financial transaction.
92. This process is, of course, contingent on the customer’s MNO agreeing to provide USSD access to the MPO. A USSD-based mobile payment service’s success would thus depend on how many MNOs give USSD access to the MPO as this directly affects the size of its potential customer base. Ideally, an MPO would want to have USSD access from all MNOs so that it can service all potential customers.
93. USSD is a communications channel that is embedded in the GSM network of the MNOs. This GSM network is used by MNOs to provide core services, namely voice, in its primary market, i.e., the telecommunication market. Thus, the USSD channel is available to all MNOs running GSM operations. To provide USSD access to an MPO, MNOs need to invest in a USSD gateway and a mini browser. A USSD gateway allows an MPO to connect to the USSD channel of an MNO and helps in billing the customer/MPO.

SMS

94. SMS, a popular communications channel to send messages on mobile phones, can be used to send a request for information or a transaction to a prespecified number. The MPO responds by providing the requested information or implementing the transaction through one or more SMSs.⁴⁷ The SMS facility, is as effective as USSD in terms of reach (i.e., compatible handsets).

IVR

95. IVR works through calls made to prespecified numbers provided by an MPO. Based on an electronic message menu, the customer can choose and implement transactions by pressing appropriate options on their keypad.^{48,49}

⁴⁵ J. Sanganagouda. Aricent. *USSD: A Communication technology to potentially oust SMS dependency*. A White paper. Available at http://www.aricent.com/files/pdf/Aricent_WhitePaper_USSD_0911.pdf

⁴⁶ A USSD shortcode is used to initiate a USSD session, and comprises of an astrix, a number, and a hash.

⁴⁷ Telecom Regulatory Authority of India. 20 September 2013. *Consultation Paper on USSD-based Mobile Banking Services for Financial Inclusion*.p. 37.

⁴⁸ Telecom Regulatory Authority of India. 20 September 2013. *Consultation Paper on USSD-based Mobile Banking Services for Financial Inclusion*.p. 37.

⁴⁹ Technically, IVR would also allow customers to use voice prompts to choose and implement transactions, however the authors are unaware of any existing deployment successfully using voice recognition to advance financial inclusion.

Internet

96. Internet is another communications channel which MPOs can leverage to offer mobile payments. This is being increasingly used as a result of proliferation of internet-enabled mobile phones across the world. The users of these phones can send instructions to their mobile payments operator via the internet. For example, mobile apps can be used to access mobile payment services of different MPOs.

STK

97. It enables a phone SIM card to initiate actions that can be used for value-added services such as mobile payments. This application is installed on the SIM. Thereafter the communication happens over existing channels such as SMS or USSD. The benefit of using STK is that it makes these communications more secure and user friendly. One potentially major drawback of STK is that typically only an MNO would have access to the SIM cards of its customers, which means STK is not a readily available option for banks or other MPOs. Further, MNOs need their existing voice customers to swap their SIM cards to use STK.

Distribution network

98. Besides the communication infrastructure, another key requirement for an MPO is a network of CICO points for its customers. Cash-in can either happen electronically (for example, via electronic funds transfer from a bank account, via another wallet, or via salary or government-to-person payments) or at physical cash-in outlets. Since many customers may not receive funds electronically, physical cash-in is a very important part of a mobile payment service. Cash-out is also important for customers as cash still dominates financial transactions in most developing countries. Creation of this CICO network is likely to entail a significant investment for MPOs. Other than creating this network on their own, MPOs can also use existing networks for scaling up quickly. This requires an agreement with the owner of existing networks such as:
 - 98.1. Existing retail network of the MNOs that is used to sell airtime and other services
 - 98.2. Network of bank branches and ATMs
 - 98.3. Existing network of retail chain stores, such as Pick 'n Pay in South Africa
99. Note that the MPOs may also need an agent network for other uses apart from serving as CICO points. These could be in terms of helping to open accounts of customers or to serve as OTC intermediaries between customers and the MPO. Depending on the model used, agents used for these purposes may overlap in different ways with the CICO agents.
100. Another infrastructure of banks that MPOs use is the bank's branch network for cash management. The cash management facilities are required by the CICO agents of the MPOs to deposit their excess cash or replenish the cash they hold by withdrawing from a bank in case the agent does not have adequate cash for cash-outs. It may also be difficult for an MPO to manage cash for every agent in the country, especially in remote areas, because of security concerns. On the other hand, banks may be better equipped to perform this function through their existing network of bank branches as they already have facilities in place to transfer cash between bank branches/ATMs, and already offer cash management facilities more broadly.

Costs and revenues of the MPOs

101. The above requirement for infrastructure results in significant costs for MPOs:

101.1. *Communications infrastructure.* MNOs charge a price for communications infrastructure accessed by MPOs. The price of USSD can be charged per session to consumers, as is done in Kenya and Nigeria, or to MPOs. The latter can be in the form of a per-session price or a revenue share agreement as in Bangladesh. For SMS, IVR, or internet, customers are likely to pay the standard rate for accessing those communications channels.

101.2. *CICO network.* Another infrastructure cost for MPOs is setting up and maintaining the CICO network. These costs include costs of training and providing technical support to the agents. In addition to these costs, the agents are typically paid per transaction by the MPOs. Several of these costs could be fixed, leading to significant economies of scale. This implies that MPOs need to attain a critical mass in terms of number of transactions to be financially viable.⁵⁰ Note that for MNOs or banks that may have an existing network (agents or ATMs and bank branches) the level of investment required may be lower than for others.

102. MPOs in turn earn revenues by charging customers for using the various services discussed above. An MPO may not charge a price for all its services, and the pricing structure can vary significantly across MPOs.

102.1. *Account fee.* The MPO can charge a fee for opening an account. However, this fee is likely to be relatively small to encourage more accounts.

102.2. *CICO transaction fee.* The MPO can charge a fee for cash-in as well as cash-out transactions. This fee could be, for example, a percentage of the total value of cash deposited/withdrawn.⁵¹ In practice, many MPOs do not charge for cash-in and do so only for cash-out.

102.3. *Transactions/money transfer.* Similar to the CICO transaction fee, the MPO can charge a transaction fee for money transfers and payments.

102.4. *Adjacencies.* In addition to the above, the MPO can also earn revenue from offering other financial products, or accrue benefits from cross-selling⁵² or greater customer retention.

⁵⁰ Scale is also necessary to make the business worthwhile for agents. Agents that see too few transactions are likely to lose interest, deprioritize the business, and offer an increasingly inferior service.

⁵¹ See <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/keystompesassuccess4jan69.pdf> for a discussion of pricing structure of M-PESA by Safaricom in Kenya.

⁵² Selling related or complementary products to a customer.

Appendix 3: USSD Prices in Different Countries

Table 2: Prices charged for USSD access in different countries

Country	Operator	USSD price per session (local currency) ^a	USSD price per session (USD)
India	All	INR 1.50	0.02
South Africa	Vodacom	ZAR 0.60-5.0	0.06-0.50
South Africa	MTN	ZAR 0.60	0.06
Nigeria	MTN	NGN 2.00	0.01
Nigeria	Etisalat	NGN 2.50	0.02
Nigeria	Airtel	NGN 10.00	0.06
Nigeria	Globacom	NGN 8.50	0.05
Kenya	-	KES 4.00-5.00	0.05–0.06
Indonesia	Telkomsel	IDR 570-1040	0.05-0.10
Indonesia	Others	IDR 0.00	0.00
Bangladesh	-	Varies from 7 to 25 percent of transaction revenue from each SIM	

a. Vodacom and MTN charge per 20-second sessions-

Source: http://www.trai.gov.in/WriteReadData/WhatsNew/Documents/CP_on_Mobile_Banking_20.09.pdf, <http://www.vodacombusiness.co.za/smme/voice/ussd>, https://www.mtn.co.za/everyday_services/useful_extras/Pages/ussd.aspx, Stakeholder interviews

Appendix 4: Access to Bank Infrastructure Is Unlikely to Create Competition Issues

103. At a principle level it could be argued that if MNOs need to give access to USSD to banks, then banks in return should also give access to their infrastructure to ensure the existence of a level playing field between banks and MNOs. Based on stakeholder interviews, this argument appears to have no basis as access to ATM infrastructure is not critical for MPOs due to the presence of alternatives. Further, while MPOs may need access to cash management facilities, banks generally provide this service, and no complaints have been made that justify regulatory intervention.

MNOs have alternatives for ATM network

104. For MPOs, establishing a CICO network is perhaps the largest component of their expenditure. The success of an MPO in the market depends to a great extent on the reach of this network. ATM infrastructure of banks may be used by MPOs as CICO points.

105. In practice, however, most MPOs have set up their own agent network for CICO points and are not relying on the ATMs to provide CICO services.⁵³ This is because MPOs do not consider ATMs to be a realistic substitute for the agent network. MPOs can achieve a greater penetration by establishing an agent network than they can through ATMs, because in most developing countries the reach of ATMs is very limited. Indeed, the motivation behind the development of mobile payments comes from the inadequacy of bank infrastructure. Also, not all ATMs are set up to do cash-in. In contrast, an MNO can leverage its existing retail network to provide a wider distribution of CICO points. Further, in most countries, one bank is unlikely to have significant control over the entire ATM network so that denial of access by a bank will not have anti-competitive consequences. Thus denial of access to ATM infrastructure by banks is unlikely to result in competition problems, and in fact, we are not aware of complaints on this front.

Sufficient competition for provision of cash management facilities by banks

106. MPOs have noted that they need banks to provide them with cash management services. However, it is unlikely to become a regulatory problem, and there are no complaints noted against banks by MPOs, reflecting that there is a well-developed competitive market for cash management facilities. It is unlikely that banks discriminate specifically against MPOs as it offers these services to customers in other sectors (i.e., a market for cash management services already exists).

107. Note that in many countries, the commercial banking sector is populated by several banks (typically many more than MNOs). Almost all banks provide cash management services, and one bank may not necessarily have an advantage over the other in terms of providing this service. No single bank is therefore expected to be dominant in the provision of cash management services.

⁵³ Note that there are exceptions where MPOs do in fact rely on the ATM infrastructure for CICO. Ferlo, a third-party MPO in Senegal, uses only ATMs as CICO points. In fact, it considers ATM infrastructure of the banks to be much safer with regard to cash-out. According to Ferlo, the MPOs in Senegal that have set up their agent networks are facing issues with cashing out. However, it must be noted that Ferlo has a different business model which mainly depends upon card transactions. Customers of Ferlo first become card holders and then get access to payment services through mobile. For card holders, it is much easier to use the ATMs for CICO. Therefore, for Ferlo, ATM infrastructure generally has greater utility than it does for MPOs which primarily operate through mobile accounts.