Management of Mobile Financial Services—Review and Way Forward

Per J. Nesse, Oddvar Risnes and Hanne Stine Hallingby

Abstract Mobile financial services (MFS) represent an area of innovation and strategic importance for global initiatives against poverty and mobile telecommunication providers. The World Bank wants financial inclusion of the poor, and the telecommunication providers seek profit. Firstly, this paper introduces a MFS terminology overview before reviewing previous research on MFS and the global MFS industry picture today. The literature review on mobile payment services shows that researchers from late 90s until now have focused mostly on technology and consumer adoption. Only recently the research has picked up on studying MFS as complex ecosystem with lots of tension and dependent on local circumstances. Secondly, we provide key learnings from the Easypaisa MFS case in Pakistan. This is an example of successful management of a complex ecosystem with processes and events that moved a MFS implementation from one state to another—from cash-based OTC solution to a digital mobile wallet-based solutions. The case study is based on interviewees with the mobile operator, agencies, and governmental organizations like Pakistan Telecommunication Authority, the largest social cash transfer program in Pakistan (BISP), and nongovernmental organizations. Finally we present the way forward for MFS including research recommendations.

Keywords Mobile financial services · Ecosystem management
OTC and mobile wallets · Biometric ID · Easypaisa

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1 Introduction

About 2 billion adults in the developing world are considered financially excluded or unbanked, meaning that they do not have access to basic financial services (Bank 2014). However, the majority of the unbanked own or have access to a mobile phone, hence access to mobile financial services. These services can contribute to financial inclusion fostering economic growth, fighting poverty, and improving social conditions for the unbanked and unserved (CGAP 2015; Khan 2016). This is pointed out in national and global strategies for financial inclusion and literacy in several developing countries (State Bank of Pakistan 2015; Khadija et al. 2012; OECD 2013). Mobile operators see MFS as an opportunity for revenue generation through an adjacent business (both basic payment and services such as credit, lending) and recouping of cost and investments through increased data usage by consumers (Dennehy and Simmons 2015). These commercial goals are accompanied by positive socioeconomic effects, i.e., financial inclusion of the unbanked can increase the country's GDP (BCG 2011). Furthermore, the benefits for banks may come from (1) protection of current account and products and avoiding disintermediation by third parties and (2) reduced use of cash, while serving the unbanked in a cost-effective way. For the merchant, higher Point-of-Sale (PoS) throughput, less cost for cash handling, and real-time messaging to users are major benefits with MFS. In addition, a richer personalized shopping offering using digitalized loyalty cards and coupons is also possible. Access to transaction data and ownership of the user interface are also vital benefits (Hernæs 2016). Finally, for the customer, MFS makes payments possible anytime, anywhere, and with reduced risk of theft (cash—especially in underdeveloped countries). Governmental stakeholders that perform many small money transactions to private persons (G2P) will also benefit from mobile solution.

In this paper, we ask which factors that have positively affected uptake of mobile accounts in Pakistan and how the current successful OTC service solution has slowed down the uptake and use of mobile accounts? We answer these questions with a case study of Easypaisa in Pakistan.

2 MFS Terminology and State of the Industry

Mobile financial services is defined as the use of a mobile phone to access financial services and execute financial transactions, i.e., mobile payment, mobile insurance, mobile credit, and mobile savings are all mobile financial services (GSMA 2015). Mobile payment refers to transfer of money (domestic or international) via a mobile money platform, using a mobile device. These transfers can take many forms, including bill payment, bulk disbursement, and money transfers between persons, i.e., person-to-person (P2P), or as government disbursements to private persons, i.e., government-to-person (G2P). Moreover, the payment may occur in a retail

store (proximity) or remotely (online) from account to account (A2A). The service must rely heavily on a network of transaction points outside bank branches and ATMs, which make the service accessible to unbanked and underbanked people. Mobile credit, insurance, and savings are mobile-based versions of familiar financial services, enabling the customers to access microinsurance, loan, and saving services using a basic mobile phone. In a global perspective, the majority of subscribers using such mobile services together with payment services do not have access to traditional bank branches. For these subscribers, mobile money accounts (mobile wallets/mWallets) can fill the role that conventional bank accounts have in mature markets. An active mobile account is defined as an account/wallet which has been used to conduct at least one transaction during a certain period of time, e.g., 90 days (GSMA 2015).

Various enabling technologies are used for mobile payment service. Arthur D. Little (Duvaud-Schelnast and Born 2016) presents an overview of the current situation for enabling technologies. Short message service (SMS)/USSD, mobile Internet, and NFC are the technologies most used for mobile financial services. We can identify three distinct approaches. First, to address the needs of the underserved, the focus has been on providing a service that can be used from a basic mobile device not relying on data coverage. The services being monitored by the GSMA mobile money program fall into this category. SMS/USSD is the enabling technology here; thus, payment services can be done from a basic feature phone and over 2G networks. Also, early implementations in the Nordics have led to a continued use of SMS/USSD-based services in these developed economies. Second, initiatives that stem from mobile Internet providers have—not surprisingly—led to a generic platform for development of payment services, based on mobile broadband connection and "pay-pal look alike" solutions, e.g., (Fung 2016). Chinese players have been dominating this approach. Third, there are initiatives that are based on a strong collaboration between banks and MNOs to build contactless payment services based on NFC.

The number of mobile money services has grown steadily for many years and has now reached 271 services in 93 countries, here defined as services for the underserved, i.e., without bank accounts, and allowing access using a basic mobile phone (GSMA 2015). The sub-Saharan/African continent dominates with roughly 50% of the services in total. Here we find the SMS/Telco-based M-Pesa payment service in Kenya as a major service. The other major region is South Asia. Here we also find Easypaisa in Pakistan and bKash in Bangladesh, as leading examples of payment services (GSMA 2016). So far, we see that the large majority of deployed services are in mobile money (mobile payment). This may be due to mobile operator focuses on satisfying the immediate user needs for providing payment transactions. From 2013, there is a growing uptake of mobile insurance. Mobile saving and mobile credit services that are critical for financial inclusion are still small. However, in 2015, roughly 200 mobile insurance, and credit and saving services were commercially deployed in developing countries. The mobile insurance industry continued to expand in 2015, with 120 live services by the end of December (a 9% increase from 2014). Mobile insurance is now available in 33

emerging markets, predominantly in sub-Saharan Africa (58%), South Asia (19%), and East Asia and Pacific (18%). The majority of mobile insurance services continue to be led by mobile operators (63%), a slight increase from 2014.

Further, the number of mobile insurance policies issued increased by 68% from last year, to 31 million policies by June 2015. As of December 2015, there are 45 live mobile credit services across 16 countries—the vast majority of these services in sub-Saharan Africa (82%), with 9% of services in East Asia and Pacific. Seven new services were launched in 2015, compared to 12 launched in 2014. There are at least 13 planned mobile credit services across sub-Saharan Africa and South Asia, suggesting continued interest in offering mobile credit. Of new services launched in 2015, all were in sub-Saharan Africa. In 2015, the number of live dedicated mobile savings services globally increased by 20%, up to 36 services from 30 services at the end of 2014. Mobile savings services are available in 18 countries, primarily in sub-Saharan Africa (54%), East Asia and Pacific (23%), and South Asia (20%). Six new services are launched in 2015 (all within sub-Saharan Africa), and of these, one-third are a combined mobile savings and mobile credit product, highlighting the relationship between these two products. In 2015, customers are saving more. Based on survey respondents, the number of registered mobile savings accounts increased from 22 million accounts in 2014 to 32 million in 2015. By the end of 2015, 411 million customers have a registered mobile money account (up 31% from 2014). Nearly one hundred million new accounts were opened in 2015, primarily in sub-Saharan Africa and South Asia. This steep growth is a good sign for products like credit and saving, since these services rely on accounts that comply with Know Your Customer (KYC) requirements (GSMA 2016).

3 State-of-the-Art Theory and Related Research

Mobile financial services are better understood with a systemic approach where implementations are contingent on local conditions and outside the control of any market actor (Dahlberg et al. 2015); lately such markets have been called ecosystems (Gawer and Cusumano 2014). Widely used implementations of technological systems are described with characteristics such as being an installed base (Hanseth and Lyytinen 2010), being a platform (Gawer and Cusumano 2002), having acquired momentum (Hughes 1993), and being subject to network externalities (Bergek et al. 2008); these characteristics have the form of being empirical observations of as well as managerial guidelines for how a technology earn wide use. Such systems and dynamics are not controlled by one actor; still, commercial actors enjoy wide use and belonging profits from installed bases, and public bodies enjoy benefits for citizens. Because of such desired benefits, there are also examples of technological systems that were promoted by actors, but failed (Reuver et al. 2014; Ozcan and Santos 2015).

Installed bases and platforms are technological systems that other actors use for further innovation and benefits (Hanseth and Lyytinen 2010; Gawer and Cusumano

2002; Yoo et al. 2010). Although there are indisputable benefits that emerge only when the system is widely available, the literature also discusses the problematic lock-in effect. Lock-in implies high path dependencies, e.g., a system's interdependencies are so high that it takes time, is costly, and perhaps impossible to change (Hanseth and Lyytinen 2010). Interdependencies and lock-in remains a challenging empirical fact (Eriksson and Åkerfalk 2010), despite approaches such as technology modularity (Baldwin and Woodard 2009). Taken together, in existing successful implementations of technology systems, we should in the first instance expect to find dominant installed bases and path dependencies. In the next instance, we should expect to find inertia and lock-in situations when installed bases are challenged. Even though new components introduced into an existing system clearly could bring further benefits, it is the system's former success that hinders the new to emerge.

Mobile financial services in Pakistan demonstrate a successful installed base using a manual over-the-counter solution; it is a platform taking advantage of mobile operators' agent network to provide money transfers between end users. Stakeholders have long worked to transfer users to digital mobile wallet (mWallet) without succeeding. Innovation with the existing solution is present, but the potential innovation is expected to be a lot higher with digital services and a lot is at stake. A sudden event—namely the new biometric requirements for SIM cards—changed this situation. It became easy to establish a mWallet account, and the number of users and frequency of use made a jump. Still, at this point of transformation, the forces from existing and new installed bases draw in different directions: one toward the continued use of OTC, and the other toward the new digital accounts. This is an interesting example of a technical system going through phases of stability—destabilization—re-stabilization.

Thus, it makes sense to analyze mobile financial services with characteristics drawn from technology systems. Their emergence takes an evolutionary path, meaning that they are systemic in nature, and it is difficult to predict one of many possible outcomes or stable situations (Hanseth and Lyytinen 2010; Bergek et al. 2008). Mobile financial services are currently at an early stage (Dahlberg et al. 2015) where we barely have seen the emergence of dominant designs, not to say, the disruption of such. What we see at play in Pakistan is how the current design so far is continuing its dominance. The new design has started to grow, but we do not know to what extent it will succeed. Our intention is to document the forces that have enabled and sustain the current OTC situation. Furthermore, we will explain how the biometric event has fueled off a new design.

The major reviews of the mobile payment field covered two time periods (from 1998 to 2006, and from 2007 to 2014) (Dahlberg et al. 2015). Three focus areas of research were detected—technology, customers, and ecosystem. With respect to technology, the top five research aspects are security including privacy, message protocols, security proofs, public key infrastructure (PKI)/WPKI, and authentication.

Looking at articles published during the years 1998–2006, and then 2007–2014, we find that the maturity of the technology literature has increased. We also found fewer proposals for new technologies. Instead, the majority of descriptive articles discuss how to improve the deployment, use, or impact of an existing technology. Furthermore, most of the 13 articles classified into the proposed constructions have a mathematical or logical evaluative section about the merits of the construction. The relative proportion of empirically evaluated constructions with prototypes has remained at the same level—slightly under the 25% level. As a whole, the technological articles are more mature and sophisticated than before, though they are more fragmented and one-sided.

Concerning consumers, there is an overweight of consumer adoption studies using Technology Acceptance Model (TAM) and other diffusion theories. TAM has limitations: It assumes that there is a single technology available to users, ignoring cultural issues, business environment, alternative methods of making payments, and also various legal and financial regulatory issues (Shin 2009). A review of journals from 2004 to 2014 concludes that the m-banking adoption literature is fragmented and limited by its narrow focus on SMS banking in developing countries (Shaikh and Karjaluoto 2015). The literature on consumer adoption suggests that main factors influencing consumer attention and usage of mobile banking services are compatibility (with user lifestyle), trust (in mobile banking), and perceived usefulness/ease of use/risk/cost and advantage. The results from a survey of mobile payment users in Korea show that early adopters value ease of use, while late adopters value usefulness when it comes to adoption of the MFS services (Kim and Lee 2010).

Finally, regarding the ecosystem area, the majority of articles describe a field where technologies and markets are understood as complex, networked, and interdependent (Dennehy and Simmons 2015). The relationship between technologies and actors is regarded as a main source for explaining both failure and successes, and theories on ecosystem and cooperation (Donovan 2012), collaboration (Reuver et al. 2014), and collective action (Guo and Bouwman 2016) are dominating the field. Several authors have recently applied and acknowledged the business ecosystem approach (GSMA 2015; Zhong 2015). The ecosystem actors or stakeholders most often referred to are financial institutions, mobile network operators, regulators, merchants, consumers, mobile device manufacturers, and technology/SW providers.

4 The Easypaisa Case in Pakistan

This section describes the major events and reasoning behind the development of the Easypaisa mobile payment service in Pakistan and the role of some major ecosystem actors. We elaborate on the factors that can have positively affected the transformation from OTC to mobile wallets and the tensions that occurred during this process.

4.1 Research Methodology

We focus on a single explanatory case study where the current stable and successful situation is potentially destabilized by major events (e.g., enforced re-verification of SIM). The Easypaisa case is an opportunity to observe changes predicted from destabilizing events, and how current stability is still obstacle to changes (Yin 2014). We use the growth of OTC transactions and mobile wallets as dependent variables. The factors that are explaining the growth of these and the change from one to the other are regarded as independent variables. We had semi-structured interviews through e-mail with different stakeholders during 2015. We interviewed different stakeholders in Pakistan, including mobile operator Telenor, agents, and governmental organizations like Pakistan Telecommunication Authority and BISP together with nongovernmental organizations (NGOs). The interviewees were selected based on purposive sampling, which allows the research questions better to be answered (Bryman and Bell 2011). All interviews were recorded and transcribed in full. Furthermore, secondary data sources from Telenor reports, Web sites, press, etc., are utilized along with quantitative user data from State Bank of Pakistan and Telenor.

4.2 Growth of OTC Transactions and Mobile Wallets

According to State Bank of Pakistan (2015) and State Bank of Pakistan (2017), the numbers of accounts increased from 7.5 million in Q1 2015 to almost 24 million in Q1 2017; see more in Table 2. However, the OTC solution remains a demanded solution; the reason given for not transferring to mobile accounts continues to be that people do not need it for their purposes. Although mobile money accounts increased across most demographics, the increase was larger among urban citizens, males, and those above the poverty line, ref the Financial Inclusion Insight (2016). The breakup of OTC transactions shows that fund transfers and utility bill payments are dominant both in terms of number and volume, followed by government-to-person disbursements (State Bank of Pakistan 2017). The breakup of mobile wallets shows that the majority of transactions are contributed by mobile top-ups, followed by cash deposits and withdrawals and fund transfer through mWallets. Government-to-person disbursements also represent a significant value of the transactions. A few are using mobile money solutions for making purchases at a grocery shops or retail stores, partly due to lack of merchants ready to make these digital transactions (finclusion.org 2015).

Figure 1 illustrates the growth in number of OTC transactions and mobile wallet transactions from 2014 to 2015. We also find the mWallet/OTC ratio for the same period depicted in the figure.

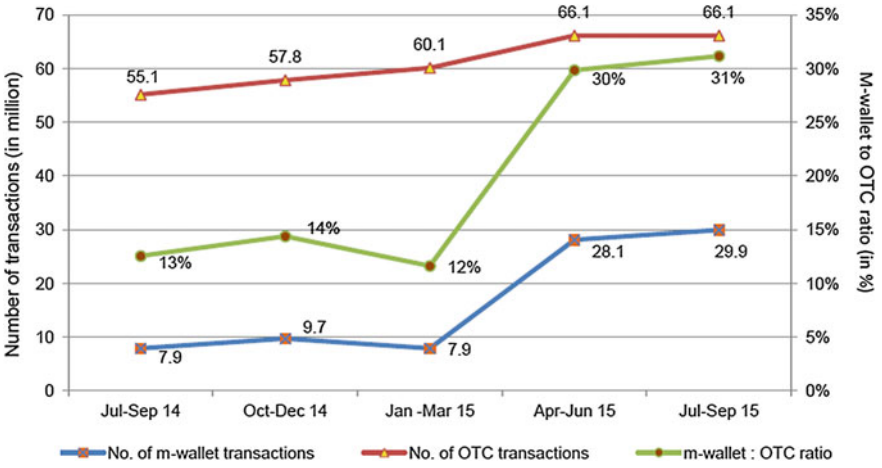

Fig. 1 OTC to wallet from 2014 to 2015 for all providers (State Bank of Pakistan 2015)

From Fig. 1, we see that there is a major shift in the trend in Q1 2015 with respect to number of transactions and the mWallet/OTC ratio. This coincides with the re-verification of SIM cards with biometric ID by the Pakistani authorities in 2014 as well as simplification of the registration process imposed by Easypaisa. Moreover, active involvement in large governmental money transfer and NGO programs through digital solutions was also initiated during this period; see more in Table 1. Figure 2 illustrates the increase in number of mobile money transactions through OTC and mobile wallet delivery solutions and the perceptual ratio until today.

From Fig. 2, we see that the OTC solution reached its top in June 2016 with almost 70 million transactions, but is now declined down to 58.6 million transactions in March 2017. The number of mWallet transactions has increased in the same period from 44.6 million to 77.1 million. The mobile wallet solution (using mobile accounts) now covers roughly 57% of all the transaction (Q1 2017). These transactions are not limited to Easypaisa subscribers only, but cover two other major competing MNO/bank providers in Pakistan; see more in Table 2. We also see that there is a drop in number for OTC transactions in Q2 2016 and lift in number of mobile wallet transactions which most likely is a consequence of the expansion of total number of agents for all mobile network operators in this period—from roughly 267,000 in Q3 2015 to roughly 368,000 in Q1 2017. The number of mobile accounts increased from roughly 13 million to 23 million during this period. Easypaisa also had a major brand and marketing campaign this period designed to educate potential customers about how the Easypaisa mobile account worked and its benefits (convenient and secure money transfers and payment of utility bills (Arif 2016).

Table 1 Development of Easypaisa company and services (State Bank of Pakistan 2017; Arif 2016)

Ecosystem stakeholders	Critical decisions and events	
	2009–2014	2015–tt
Easypaisa services and activities	• 2009: Transactions only over-the-counter (OTC), followed by utility bill payment and money transfer • 2010: Mobile wallets. Airtime top up, savings and insurance • 2013–14: ATM cards, interbank fund transfer • 2014: mWallet registration with biometric verification system	• 2015: Biometric string registration • 2015: Easypay • 2016: Mobile account credit and loans • 2016: Biometric money transfer service • 2014–2015: Marketing campaigns
Regulators	• 2014: Telco regulator implement strict biometric ID requirements for all new mobile subscriptions • 2014: Bank regulator accept mobile subscriptions as basis for level 0 bank accounts, i.e., enables easy account opening	• 2015: Telco regulator implement strict biometric ID re-verification of all mobile subscriptions—all mobile subscriptions can now easily open level 0 bank accounts
Easypaisa competitors	• 2010–12: UBL Omni, Timepay • 2013–14: UPaisa, HBL Express, MCB Lite, MobilePaisa, Mobicash	• 2015: MobiCash, UBL Omni—string registration
Easypaisa agents	• 2009: 8000 Easypaisa agents • 2012: 20,000 Easypaisa agents • 2015: 267,000 agents for all mobile network operators	• 2016: 75,000 Easypaisa agents • 2017: 368,000 agents for all mobile network operators
Easypaisa G2P and B2C disbursement solutions	• 2012: BISP collaboration • 2014: SERP collaboration	• 2016: NESTLE partnership • 2014–2015: For example, Rabat bakers, Coffee planet, Cinepax movie centers
Nongovernmental organizations (NGOs)	• 2010–14: Helix, ACTED, Karandaaz, Intermedia	
All mWallet providers	• 2015 (Q1): mWallet users: 7,5 mill • 2015 (Q1): Active mWallets: 20% • 2015 (Q1): mWallet/OTC ratio: 12%	• 2017 (Q1): mWallets: 23.7 mill. • 2017 (Q1) Active mWallets: 48% • 2016 (Q3): mWallet/OTC ratio: 57%

4.3 Easypaisa—Background and Development

In 2004, Telenor acquired a license for providing GSM services in Pakistan. In March 2008, the State Bank of Pakistan (SBP) issued Branchless Banking Regulation, calling for a bank-led model, which meant that only commercial banks and microfinance banks with an existing banking license were eligible to apply for a

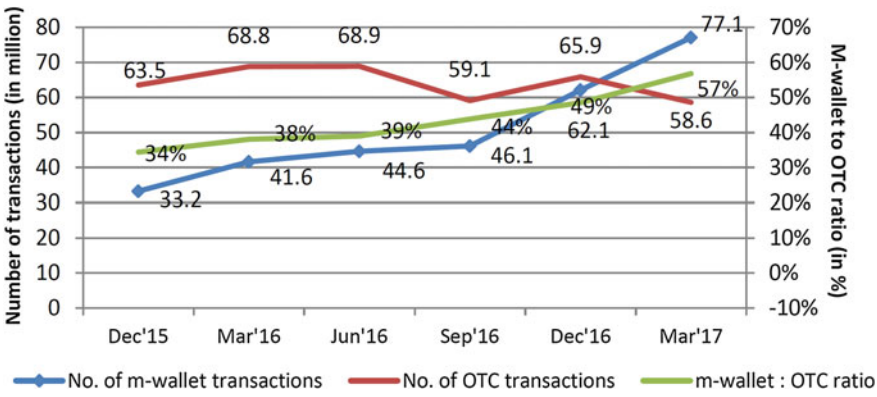

Fig. 2 OTC to wallet from 2015 to 2017 for all providers (State Bank of Pakistan 2017)

Table 2 Mobile money market shares for Easypaisa and major competing mobile operators in Pakistan (State Bank of Pakistan 2015, 2017)

Market shares		Major mobile network operators and *MFS service introduced*		
		Telenor *Easypaisa* (2009) (%)	Mobilink *Mobicash* (2014) (%)	UBL *UBL Omni* (2010) (%)
2015 (Oct–Dec)	Agents	32	19	13
	Mobile accounts	64	20	14
	Active accounts	26	48	23
	Volume of transactions	54	26	14
	Value of transactions	52	23	15
2017 (Jan–Mar)	Agents	31	19	11
	Mobile accounts	45	42	11
	Active accounts	34	51	13
	Volume of transactions	39	47	9
	Value of transactions	47	35	11

branchless banking license. In November 2008, Telenor Pakistan acquired 51% ownership stake in the Pakistani microfinance bank, Tameer Bank, to offer real-time online banking at branches and 24-h service branches and agent shops. A joint Easypaisa management team was established to handle decisions concerning the two companies' responsibilities (McCarty and Bjaerum 2013). In March 2016, Telenor acquired the remaining 49% shares of Tameer Bank, making Tameer a wholly owned entity within the Telenor group.

Table 1 displays the sequences in the development of the Easypaisa mobile money service along with major stakeholders and critical decisions and events. The different stakeholders' role and contribution are covered more in detail further on in the article.

After the launch of Easypaisa in 2009, the portfolio of mobile money services has grown to more advanced services like mobile credit/loan and insurance. Beyond Telenor and Tameer Bank, we also find other MNO/Bank providers, although present with a more limited service portfolio compared to Easypaisa. Regulating authorities for both banks and telecommunication are stakeholders setting the premises for the market evolution. National Database and Registration Authority (NADRA) in Pakistan is a public agency for national biometric ID cards; it is also an actor that has commercial interests in the field of ID. Agents for mobile operator constitute the infrastructure of the current OTC solution and are the interface toward end users. Nongovernmental organizations (NGOs) play a critical role with large transfers of money, The Benazir Income Support Program (BISP) being the major one. In February 2014, Easypaisa won two GSMA awards: "Best Mobile Money Service in the World" and "Best Mobile Money Service for Women in Emerging Markets."

4.4 Critical Decisions and Events

Initially, the Easypaisa team considered a mobile account delivery model—a digital wallet on the customer's phone where they convert cash to digital currency through agents and then perform payment transactions from anywhere. Customers, both Telenor customers and other competing MNO customers, simply went to any Easypaisa agent, presented their CNIC, and handed over cash to the agent who performed the transaction (Khan and Rashid 2015). However, there were several challenges attached to such a model. One was that, e.g., Telenor Pakistan had only 22% market share, and using the mobile account model would exclude about 40 million non-Telenor Pakistan GSM subscribers. A second challenge was the comprehensive Know-Your-Customer (KYC) procedures for mobile account registration; it involved a photograph and a copy of the customer's original government-issued computerized national ID card (CNIC) using an Internet-enabled device (computer or smartphone) on site. The Easypaisa team decided that this would be too cumbersome and costly for the business model and a major barrier to customer adoption, also considering the low educational level and illiteracy among potential customer. Hence, they launched Easypaisa as an OTC service; transactions became agent assisted and no registration was required. The OTC model also ensured buy-in from the agents since it provided them with more transactional revenue versus the mobile account service, in which commission is limited to cash-in and cash-out (CICO) transactions. However, it was recognized that the OTC model had a number of limitations both for the customers, the mobile money providers and the market, that was necessary to deal with going forward. According to Malik (2015), OTC limits the range of financial services to be offered to customers since it is not based on strict KYC requirements. Since there is always cash involved in an OTC transaction, there is a heavy burden on the distribution network to collect cash from high cash-in locations and to ensure cash is available

at high cash-out locations. In 2010, the Easypaisa mWallet solution using mobile accounts with money transfer and bill payment was launched. However, the active use of these accounts was low, and to encounter the agents' bargaining power and spur users' uptake, Easypaisa sets transaction fees between mobile accounts to zero, which may explain the uptake later seen in 2015. Early 2016, a transaction fee was re-introduced, although below the agents' fee.

Early 2015, the situation in Pakistan was revolutionized by a decision to carry out a re-verification of all prepaid SIM cards for mobile subscriptions—almost all subscriptions in Pakistan were prepaid. After a terrible terror attack in late 2014, the decision to re-verify all SIM cards achieved general support. In three months early 2015, the base of 215 million prepaid SIM cards was reduced to 115 million and connected about 45 million unique persons (IDs) to the cards. The process was perceived as a great success for all stakeholders. This implied that all mobile subscriptions in Pakistan are connected to a very strong ID, a biometric ID solution provided and managed by the advanced public body NADRA. The Pakistani telecommunication authority was the one that enforced the re-verification, but it also involved NADRA and the State Bank that administers the KYC requirements for mobile accounts. Telenor Pakistan also participated heavily in the re-verification with their mobile agent stores. The State Bank of Pakistan (2017) reports a strong co-variance between diffusion devices enabling biometric ID and accounts opened implicitly suggest these devices as a direct cause of the increased registering.

Already in 2014, Easypaisa got acceptance from the bank regulatory authorities that the strict ID regime for new mobile subscriptions met the basic KYC requirements for bank accounts. This led to an integrated solution for SIM sales and mobile accounts, and 20,000 agents were equipped with such devices in Q2 2014. Based on the allowance from the State Bank, Easypaisa in March 2015 launched the string solution; customer could dial a specific phone number (string) and automatically open a bank account for the ID connected to the sending phone number. More precisely Telenor subscribers could simply dial *345*3737# while non-Telenor subscribers could open their account by sending "EP<space>CNIC number" to 0345-111-3737. Thus, this service bypassed all the challenges with paperwork, illiteracy, and agent resistance when registering a bank account. However, the full effect of this new service did not appear till the re-verification of all SIM card by the Pakistani authorities.

4.5 Competitors

Currently, Easypaisa is the market leader within mobile money services in Pakistan. UBL Omni introduced their service in 2010, and Mobicash launched theirs in 2014 and are the two other major mobile money providers. Table 2 presents the three major mobile network providers and their market shares with respect to mobile wallet accounts, transaction volume/value, and agent networks' size.

In the past three years, four new providers have entered the market with mobile money solutions, mostly OTC solutions. These late entrants (UPaisa, Timepay, EBL Express, and MCBLite) are still far behind with respect to market share of agents, mobile accounts, volume, and value of transactions. We see from the table that the market share of Telenor (Easypaisa) on mobile account is reduced from 64% in 2015 to 45%. There is also a decline in volume of transactions and value of transactions during this period. However, the share of active mWallets accounts is increased from 26 to 34% during this period. Mobilink (Mobicash) on the other side has experienced a major increase in mobile accounts (20–42%) and volume of transactions (26–47%). In addition, the market share of active accounts is increased (48–51%), but the share of agents (19%) has not increased from 2015 till 2017. The market share increase for Mobilink/Mobicash is due to effective strategies toward registering and education of customers on mobile accounts (Dailytimes 2015). In addition, Mobicash refers to the "string" model and launch of ATM card as contributing causes to growth, the same strategies as Easypaisa's. The third operator UBL only experiences minor changes.

The mobile operators' agents are the main distribution channel for mobile financial services. In addition to agents and franchisees, Easypaisa was offered through Telenor Pakistan's 30 owned and operated sales and services centers and Tameer Bank's 40 bank branches (McCarty and Bjaerum 2013). By the end of its first year (2009), Easypaisa had 8000 agents trained and ready to sell Easypaisa services; three years (2012) after launch, there were 20,000. In 2012, Easypaisa embarked on a major agent training and follow-up program with a third party to retrain the majority of its retailers, and in 2016 their agent network nationwide covered 75,000 agents in more than 800 cities across Pakistan. In 2017, the total number of agents for Easypaisa and the other mobile network competitors counted 368,000 agents. In 2017, the number of active mobile accounts was roughly 11.3 million, a 15% growth from the previous quarter.

However, the popularity of the OTC solution has made the agents "kings" among the stakeholders in the branchless banking ecosystem, and most agents serve more mobile operators. This has become a dilemma to Easypaisa: Firstly, it has made the users dependent upon the agent-based OTC solution and hence reduces the expected transition to mobile wallet; secondly, it cuts into the providers' revenues (Orakzai 2016). The agent has the power—on behalf of the customer—to choose a mobile financial service provider (Easypaisa or their competitors) based on the commission and other incentives provided to him. This has sparked a "commission war" as MNOs compete for a share in the OTC market and cut down on their profit margins. A Karandaaz representative says: "*For every P2P transaction made* via *the agent, MNOs pay half of the fee charged to the franchise which is further split equally between the franchise and the agent. In addition to the regular commission paid, the MNOs spend a considerable amount on trade marketing which offers exorbitant proportions of commissions to the agents; in some cases commissions may amount to over 200% of the value of transaction.*"

4.6 Government and Nongovernmental Organizations

In Pakistan, there has been a willingness to test mobile financial services for government-to-person payments (G2P), i.e., federal and provincial government financial transfers to low-income females. For these organizations, the main objective is to get the money out on time to the women that are entitled to them; traditionally, this has been done with cash, and there have been many issues with fraud. Large money disbursement organizations has paved the way for use of mobile account, *and* the use of digital financial services also corresponds with the objectives of financial inclusion of the poor where products for loan and savings are important, government-to-person payment (G2P) programs in Pakistan reached $9.3 million in 2015. This covers the social cash program and transfer of salaries for public employees. The Benazir Income Support Program (BISP) is the largest social cash program in Pakistan and covers 15% of the entire population and 40% of the population below the poverty (bisp.gov.pk 2016). We will here elaborate on BISP; Easypaisa, however, collaborates with a diverse set of NGOs who transfer money to beneficiaries through mobile money solutions. One example on the BISP support program is the Waseela-e-Haq program launched in 2008, which provides funding small business and entrepreneurship among underprivileged people. The program covers loans with interest free returnable easy loans of Rs. 300,000. Another example is the Waseela-e-Sehet (2010), which is a health insurance scheme covering beneficiaries of all age groups up to maximum of 25,000 rupees per family. We also have the Waseela-e-Rozgar program (2015) which is a vocational training program providing recipients with necessary knowledge and skills to exercise a profession. A stipend of 6000 rupees per month is paid to the trainee during four- to six-month training.

Initially in 2008, 1000 rupees were paid out in cash through post offices each month. Soon BISP realized that this frequent transference of cash was not an optimal solution—the fraud and losses were not sustainable. Payments were reduced to four times a year, and actors started to test other digital solutions. Ideally, money should be easily deposited on an account controlled by the receiver for her to use; the reality is different. The receivers will as a rule withdraw the money as cash in the Pakistani cash economy, a majority are financially illiterate, and they do not trust their money deposited on a mobile device that is not private. Over the years, BISP—and other G2P stakeholders in Pakistan—has experimented with many different digital solutions, and they welcomed the digital mWallet solutions (The World Bank 2012). Although the bodies that transfer money keep the banks and telcos at a professional distance and share the market between actors, they recognize that innovation is dependent on their infrastructure. A BISP representative says: "*Honestly speaking—telcos are not only partners—they are brothers now. Without them—we are sitting on their shoulders. They are carriers. … there is a huge—hard work from the telcos and the from BISP to reach to this point after*

four years. If you had been there in Pakistan four years ago—you would see this nightmare which we had. Like four million beneficiaries and money orders [cash]." Still, agents' interaction with the beneficiary is not always perceived as professional, and the telcos are held as responsible for this part of the process.

5 Discussion and Implications

This paper aims to provide insight into the adoption of a new mobile money solution supporting the financial inclusion of adults in unbanked markets. We started by presenting the state of the art with respect to theory and industry. The latter showed us that MFS is expanding with respect to geography, technology, and products. With respect to the successful adoption of mobile accounts in Pakistan, we see this in relation to the mandatory biometric ID program for SIM cards by NADRA, mobile operators, and Pakistani authorities. After the initial jump from 7.5 million to 28 million mobile account transactions between Q1 and Q2 2015, the number of mobile account transactions continued to increase to 41 million in Q1 2016 until 77 million in Q1 2017. During the same period, the mWallet/OTC ratio increased from 12 to 58%. All in all, the shrinking gap between the number of OTC and mWallet transactions shows positive signals for the usage of mobile wallet account. The answers to why OTC remains the most common way to carry out mobile banking services can be found in the past. However, of the 7.5 million registered mobile accounts in Pakistan in Q1 2015, only 20% were active accounts. The corresponding number of active accounts in Q4 2015 were 41%, while the current share of mobile accounts is 45% today (Q1 2017). Together, the increase in accounts and increase in activity are promising. Still, it indicates that the majority of subscribers struggle with mobile account usage.

The main reasons identified for the slow mWallet uptake after the launch of Easypaisa in 2009 were threefold. Firstly, the OTC customer experience was just too easy for the customers; hence, there were no need to register to transfer money or pay a bill, nor to learn the USSD menu themselves. Moreover, the agents assured the transaction completion with trust and a receipt. Secondly, the product mWallet was practically the same as the OTC offering, providing no additional value to the users. Thirdly, because of the high upfront cost of registration equipment, rolling out OTC transaction points was prioritized over mWallet registration points by Easypaisa. By 2012, 87% of mobile money transactions in Pakistan were OTC rather than through mWallet and Easypaisa's OTC model had become the de facto standard for the Pakistani market. During these first years, users were trained to appreciate, use, and trust the OTC solution, and agents were trained to provide the service and recognized their power and role. In addition to the earned legitimacy and knowledge externalities, the equipment constituted an installed base of hardware and software. Even in the latest surveys provided by Financial Inclusion Insight (2016), users report no

need for anything but the OTC services; however, their awareness of other financial service such as saving and loans is continuing to be low.

The Easypaisa success also builds on the close interaction with other stakeholders, including governmental and nongovernmental program organizations (NGOs)—such as BISP, SERP, and ACTED. These stakeholders are transferring money to beneficiaries and are acknowledging the significant role mobile financial services have—and can have—as enablers for their money transfers to poor (Pickens et al. 2009). However, there is a high will and creativity in Pakistan to get a nonintended and illegitimate share of the money transfers to beneficiaries and the NGOs are continuously looking for and piloting fraud resistant solutions. So far these institutions have not landed on a final digital solution. Still, their activity support uptake of mobile accounts through the legitimation of such services and education of customers in use of digital money. According to Consultative Group to Assist the Poor (CGAP), over 75% of such government flows could be digitized within 5 years if things keep moving forward, as they have in recent years (CGAP 2015).

The new ID requirement to mobile subscriptions in 2015 has been a supporting catalyst for transfer into active digital accounts. However, the OTC solution has still a strong standing due to installed base in the form of existing knowledge, trust, perceived ease, equipment, and impact. Furthermore, even though easy to register, the new mobile accounts have so far low additional value. Providers will have to provide attractive new services and also rely on other stakeholders such as BISP to increase the growth rate in take-up. Easypaisa has been running educational and marketing campaigns and offering incentives to consumers to conduct financial transactions from their mobile accounts and in 2015 a similar campaign with money transfer from person-to-person (P2P) free. If providers and other stakeholders fail to get traction for new services, the diffusion of mobile accounts seems to follow a growth curve that still will use some years to contribute significantly to financial inclusion and base for further digital services.

6 Summary

Inclusion of the financially excluded or unbanked adults can be achieved through mobile financial services (MFS). This article starts with a novel review of the mobile financial services literature, state of industry, and deep insight from one innovative market. The majority of the research covers mobile payment services, whereas mobile loans, insurance, and savings lack sufficient coverage across the research community. A key industry observation is that the MFS sector shows strong growth: Roughly 300 services have been commercially deployed across 100 developing countries, foremost in sub-Saharan Africa and Asia. The development of the Easypaisa mobile financial service case in Pakistan provides insights into why digital mobile wallet user base is growing faster than the conventional agent-assisted OTC solution that was introduced initially, and why the OTC

solution still is popular. The empirical data drawn from major ecosystems stakeholders in Pakistan are analyzed using technological systems and installed base theory. The actions that recently have promoted the active use of mobile wallet accounts is the re-verification of SIM cards with biometric ID as well as simplification of the registration process imposed by Easypaisa. Moreover, active involvement in large governmental money transfer programs through digital solutions also seems to promote the uptake and use of mobile accounts. However, the investments in and current knowledge base, practices, and benefits from the successful OTC solution still obstruct an even stronger uptake of the mobile account solutions. Examples on further research studies include block chain technology and its potential disruption of the current MFS situation, together with data mining and analysis of mobile payment and credit transaction data.

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