



A Digital Financial Services Revolution in Kenya: **The M-Pesa Case Study**

NJUGUNA S. NDUNG'U

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By

Njuguna S. Ndung'u

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A Digital Financial Services Revolution in Kenya: The M-Pesa Case Study

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Table of Contents

<i>List of Tables</i>	v
<i>List of Figures</i>	vi
<i>List of Abbreviations and Acronyms</i>	vii
<i>Foreword</i>	viii
<i>Acknowledgements</i>	x
1. Introduction	1
2. Background	5
2.1 Financial Exclusion.....	5
2.2 Policy Changes	7
3. Initial Experiments and Policy Frameworks	9
3.1 Initial Experiments	9
3.2 The Operation of M-Pesa	11
3.3 Risks and their Mitigation	12
3.3.1 CBK’s authority and resources	12
3.3.2 General risks.....	14
3.3.3 Protection of customers’ funds through trust account.....	17
3.4 Policy Considerations	20
4. Evolution in Use	23
4.1 Initial Growth.....	23
4.2 Initial Audit	27
5. Generations	33
5.1 Generation 1: Initial Mobile Money Growth and Financial Inclusion	33
5.2 Generation 2: Linked Bank Deposits and Partnerships with Financial Institutions	44
5.2.1 M-Shwari.....	45
5.3 Generation 3: Linked Credit Scores	51
5.4 Generation 4: International Remittances.....	53
5.5 Generation 5: Partnerships with Fintech Firms	55
5.6 Generation 6: M-Pesa Impact on Monetary Policy and Beyond	58

6. Lessons, Challenges and the Future for Digitization.....	63
6.1 Lessons Drawn from Kenya.....	63
6.2 Lessons from Use of M-Pesa as a Tool for Financial Inclusion	64
6.3 Replication of Regulation and other Approaches.....	66
6.4 The Challenges	67
References	71

List of Tables

Table 2.1:	<i>Financial access by category 2006.....</i>	<i>5</i>
Table 4.1:	<i>Monthly transactions.....</i>	<i>24</i>
Table 5.1:	<i>The entry of the MFS providers in the market.....</i>	<i>34</i>
Table 5.2:	<i>M-Pesa agents, accounts and transactions</i>	<i>39</i>
Table 5.3:	<i>Financial inclusion profile in Kenya 2006-2019.....</i> <i>(% of adult population)</i>	<i>41</i>
Table 5.4:	<i>Creating a virtual savings base: M-Shwari.....</i>	<i>46</i>

List of Figures

Figure 3.1:	<i>M-Pesa operations.....</i>	12
Figure 5.1:	<i>Total customers since March 2007 (millions)</i>	38
Figure 5.2:	<i>Value and volume of M-Pesa transactions,.....</i>	
	<i>March 2007-August 2020</i>	39
Figure 5.3:	<i>Mobile financial services agents.....</i>	40
Figure 5.4:	<i>Progress in financial access in Kenya, 2006-2019 (%)</i>	42
Figure 5.5:	<i>Financial access touch points.....</i>	42
Figure 5.6:	<i>A regional comparison</i>	43
Figure 5.7:	<i>Growth in branch network in Kenya</i>	47
Figure 5.8:	<i>Growth in bank deposit accounts in Kenya,.....</i>	
	<i>2005-2019.....</i>	48
Figure 5.9:	<i>Agency banking uptake in Kenya, 2010-2019</i>	49
Figure 5.10:	<i>Utilization of financial services across the providers:</i>	
	<i>2006-2019.....</i>	50
Figure 5.11:	<i>Adults using financial services providers (million)</i>	51
Figure 5.12:	<i>Active digital accounts in Kenya 2016 versus 2019.....</i>	52
Figure 5.13:	<i>Active digital accounts, country comparison.....</i>	53
Figure 5.14:	<i>Migrant remittance inflows (US\$ millions).....</i>	54
Figure 5.15:	<i>Cost of sending money to Kenya by corridor</i>	55
Figure 5.16:	<i>Future strategies of banks regarding fintech.....</i>	
	<i>companies worldwide 2017</i>	57
Figure 5.17:	<i>Velocity of money.....</i>	58
Figure 5.18:	<i>Money Multiplier (M3/RM)</i>	59
Figure 5.19:	<i>Decline in cash outside bank in relation to</i>	
	<i>broad and reserve money.....</i>	59
Figure 5.20:	<i>Increase in financial depth in Kenya (%).....</i>	60

List of abbreviations and acronyms

AFI	Alliance for Financial Inclusion
AML	Anti-Money Laundering
ATMs	Automated Teller Machines
BOT	Bank of Tanzania
CA	Communications Authority (CA) of Kenya
CBA	Commercial Bank of Africa
CBK	Central Bank of Kenya
CCK	Communications Commission of Kenya
CEO	Chief Executive Officer
CFT	Combating Financing of Terrorism
CRBs	Credit Reference Bureaus
DfID	Department for International Development (UK)
DFS	Digital Financial Services
DTM	Deposit-Taking Microfinance
EAC	East African Community
FATF	Financial Action Task Force
FSD (K)	Financial Sector Deepening (Kenya)
GSMA	Global System for Mobile Association
KBA	Kenya Bankers Association
KCB	Kenya Commercial Bank
KDIC	Kenya Deposit Insurance Corporation
KEPSS	Kenya Electronic Payment and Settlement System
KYC	Know Your Customer
MFBS	Micro-Finance Banks
MFS	Mobile Financial Services
MM	Mobile Money
MNOs	Mobile Network Operators
MSMEs	Micro Small and Medium Enterprises
MVNOs	Mobile Virtual Network Operators
NBFIs	Non-Bank Financial Institutions
NPS	National Payments System
SACCOs	Savings and Credit Cooperative Societies
SIPS	Systemically Important Payment System
SMS	short message service
US	United States

Foreword

In 2007, I participated in the launch of M-Pesa where Prof. Njuguna Ndung’u, the Governor of the Central Bank of Kenya, stated that he had allowed M-Pesa to operate, but that the Central Bank would regulate M-Pesa once it understood what it was regulating (this is what in later years has been described as ‘Test and Learn’ approach and a Regulatory Sandbox). That moment represented the start of M-Pesa’s public journey, which became proof of a concept that has influenced the development of financial services across the world. Today, because of M-Pesa and the agent banking that followed in response, over 86% of adult Kenyan’s are financially included. It is an impact no one at the time could have predicted.

In this paper, Prof. Ndung’u provides a unique, personal perspective of the development of M-Pesa. He discusses the need as a regulator to balance innovation and systemic risk while promoting competition. Competition was of itself a difficult concept when regulating an innovation being launched by a monopoly into a market for financial services containing dominant institutions. He is frank about the pressure he faced from the banking sector and policy makers and how these challenges were addressed.

The paper characterizes generations of M-Pesa, covering initial growth, bank linkages, digital credit, international remittances and fintech. It further notes the monetary policy impact of M-Pesa in the velocity of money circulation and the money multiplier in the money supply process that pushed the changes in monetary policy framework. These generations demonstrate how the continuing journey of M-Pesa, which has hugely benefited Kenyans, has facilitated rapid growth in financial technology and stimulated digital government and digital transformation. The story continues, and there will be future M-Pesa generations. M-Pesa’s success is lauded both by Prof. Njuguna Ndung’u and his successor at the Central Bank, Patrick Njoroge.

Despite this success, or arguably because of it, policy makers must now contend with new challenges: to competition, technology-based barriers to entry, interoperability, data protection, data privacy, cybersecurity, disintermediation, and financial technology - in a system dominated by a few successful providers.

The final section of the paper focuses on learnings and outcomes from the Kenyan experience. These lessons include the need to develop or enhance ‘information capital’ systems, the impact on payment systems and social payments, and the impact on financial innovation of M-Pesa. Lessons for regulators are provided on how to promote innovation through innovation offices, sandboxes, and reg-tech.

Prof. Ndung'u closes the paper by discussing future challenges, including those related to full account interoperability, and the need for internet connectivity across the country for people to be able to participate in the digital finance revolution, and electronic identification system to secure the market. He notes the challenges for regulators to address, including emerging cybercrime, and the need to create an enabling framework for alternative finance - specifically crowdfunding.

For me, the importance of this paper comes from the insights from Njuguna Ndung'u's unique perspective as a Professor of Economics and as a Governor of the Central Bank of Kenya. He was someone who followed principles with purpose and who navigated between multiple interests to help give birth to a transformational vehicle for financial inclusion and the start of digital finance revolution in Kenya. Certainly, much remains to be done, but so much has been achieved.

David Cracknell
Director, First Principles Consulting

Acknowledgements

This Case Study of M-Pesa: From Trading with Pre-Paid Airtime to M-Pesa and to Digital Financial Services Revolution in Kenya was started when I was a Visiting Fellow of Practice at the Blavatnik School of Government, Oxford University, under the Yaw Adjepong-Boateng Memorial Fellowship, from November 2015 to March 2016. The case study aims to contribute to discussion around appropriate regulatory and policy issues of mobile money by focusing on actions that the Central Bank of Kenya took to help M-Pesa grow in a sustainable way. Being in Blavatnik was a chance also to introduce the aspects of political economy of policy making in this case study.

I would wish to extend my deepest gratitude to Prof. Ngaire Woods, who made the Visiting Fellow of Practice possible at the Blavatnik School of Government and working with Prof Emily Jones who made my stay quite comfortable. This Visiting Fellow of Practice was so paramount that a range of articles have since been published on this subject matter. These articles include the following:

- Cashing in on digital revolution: “Digitization makes finance accessible, lowers costs and creates opportunity”, Finance and Development, Volume 53, Number 2, June 2016;
- Practitioner’s insight: M-Pesa, a success story of digital financial inclusion, Blavatnik School of Government, University of Oxford, July 2017;
- “Boosting transformational technology: Creating supportive environments for game-changing innovations”, Foresight Africa: Top Priorities for 2017. Brookings Institution, January 2017; and
- “Digital technology and state capacity in Kenya”, CGD Policy Paper 154, August 2019, available at <https://www.cgdev.org/publication/digital-technology-and-state-capacity-kenya>.

In addition, I would like to express my deepest appreciation to Jonathan Espie Greenacre, currently at the University of Boston, for having patiently edited and commented on several sections. I am also deeply indebted to David Cracknell of First Principles Consulting for valuable advice and writing the Foreword to this case study and finally to Dr Anne W. Kamau of the Central Bank of Kenya, who worked tirelessly to provide research assistance.

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Prof. Njuguna Ndung'u
Executive Director
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INTRODUCTION

‘Mobile money’ is a mobile phone-based electronic funds storage and transfer service. The whole development was enabled by the process of changing cash into electronic units of money, e-money, and store in the mobile phone. A user can deposit, store, transfer and withdraw funds from their mobile money account, much like a bank deposit. The firm providing the service is normally a mobile network operator or another type of non-bank, called a ‘mobile money firm’ (‘MM firm’) in this paper. Users can deposit and withdraw funds through ‘cash merchants’. These are corner stores, petrol stations, and other outlets operating on behalf of MM firms.

M-Pesa in Kenya stands out as a key so-called success story of mobile money. While limited examples of mobile money existed in other countries, M-Pesa was the world’s first major mobile money service. Launched in 2007, there are now 30,530,500 active registered mobile money subscriptions in Kenya of which M-Pesa subscribers are 30.2 million while Airtel money and T-Kash are 0.344 million (Communications Authority of Kenya - CAK, Q4 Statistical Report 2020) as at June 2020. The evolution that is critical to its success is associated with the development of a retail electronic payments platform that was real time and that has become a game changer in digital financial services ecosystem.

Replicate mobile money services have been launched in other countries, creating a global mobile money industry. According to the Global System of Mobile Associations – (GSMA), there are now over one billion mobile money accounts in 95 developing countries, processing a combined US\$ 2 billion in transactions every day.

While growth of mobile money has been significant, it is also uneven. Mobile money growth and use is unevenly concentrated in a small number of countries. These are Kenya, Tanzania, Uganda and several other East African countries. Isolated examples exist in other regions, particularly Bangladesh and Pakistan.

Regulation and policy is often given as a key reason for the uneven growth of mobile money. Generally, Kenya, Tanzania and other countries in which mobile money has grown tend to be classified as having ‘enabling’ regulatory frameworks. Countries with more limited growth tend to have more prohibitive regulatory frameworks.

This case study aims to contribute to discussion around appropriate regulatory and policy issues of mobile money by focusing on actions that the Central Bank of Kenya (CBK) took to help M-Pesa grow in a sustainable way. As Governor of the CBK when M-Pesa was first proposed and then launched, I have a range of insights into this process. Policy makers in other countries may find these insights useful for their own regulatory deliverables, particularly those struggling to understand how to help mobile money grow in their jurisdictions.

The case study of Kenya is particularly useful because the CBK's actions and those of Safaricom, the firm providing M-Pesa, and other Kenyan policy makers, particularly the Communication Authority of Kenya (CAK), helped spur a mobile money revolution in the country. As at June 2020, there are now 237,637 Agents providing mobile money accounts to 30.5 million active Kenyans, processing 4.8 million transactions valued at Ksh 13.1 billion per day. This system relies on low-value, high volume transactions; the average value of transactions is now Ksh 2,740.

The mobile money growth has triggered a wider financial services revolution in Kenya. Mobile money was the first generation; others followed. Generation 2: the Kenyan banks discovered the e-money platform as a technological instrument to manage micro accounts and build customer deposits. Generation 3: followed quickly naturally with commercial banks providing credit; that is loans were applied and disbursed through the same platform. This revolutionized the collateral technology. Generation 4: led to M-Pesa technological platform enabling cross-border payments and international remittances. Generation 5: has seen the collaboration between M-Pesa and other 'fintechs' that have begun to partner with mobile money firms in provision of services.

When M-Pesa was launched in 2007, financial inclusion, describing the percentage of the populations' access to formal financial services', was far much lower compared to a developed country. Just 26.7% of the population had access to formal financial services in 2006. As at 2019, 82.9% of the population had access to formal financial services while the excluded and informal access drastically declined to 11% and 6.1% from 41.3% and 32.1% in 2006, respectively.

What was the role of the CBK in this process? We did many things, but our key steps included stimulating a supportive policy environment, collaborating with other policy makers, particularly the CAK, creating sound supervisory frameworks (here the role of a regulator is to protect the market, develop the market, bring parties together to design new rules that update the regulatory environment and finally nudge the market towards the appropriate directions), and create a stable macroeconomic environment. Of course the CBK did not take these actions at the same time. There was an evolution in M-Pesa and wider mobile money arrangements.

As a whole, I can summarize five (5) major benefits that M-Pesa has made Kenya a shining example from its evolution to the digital financial system: a retail electronic payment system evolved, financial inclusion has been a success, sustainable business models developed, uptake of government e-services, and improvement of tax policies.

This case study explores the CBK's key steps in six sections. Following this introduction, the second section provides context for the launch of M-Pesa. The third section explains initial experiments with the service, risks, and the legal and policy evolution. The fourth section outlines the evolution of M-Pesa based on responses from Kenyan customers and other actors in the financial services landscape. The fifth section provides additional data on wider developments in Kenya's financial services system that arose in response to the growth of M-Pesa. The sixth section concludes with insights drawn from Kenya's experience with M-Pesa, giving main lessons, challenges and suggests next steps for digitization research.

BACKGROUND

Two main sets of factors underpinned the context for the growth of M-Pesa.

2.1 Financial exclusion

Financial exclusion, meaning lack of access to formal financial services, was a key feature in Kenya at the time of M-Pesa's launch. Table 2.1 below demonstrates that only 26.7% of Kenya's population was formally included in the economy. Financial exclusion was particularly significant in both the rural and urban areas.

Table 2.1: Financial access by category 2006

Financial Access Category	Total %	Rural %	Urban %	Male%	Female %
Formal	26.7	23.8	35.5	33	21
Informal	32.1	35.5	21.6	26	38
Excluded	41.3	40.7	42.8	41	42

Source: FinAccess Survey, 2019

Financial exclusion was a particular problem for transferring money. Without access to an electronic account, people needed to transfer money in the form of physical cash through the use of persons, buses and other public transport vehicles and sending friends was not considered efficient or safe. This is particularly pertinent given the predominance of urban to rural remittances in Kenya. Those Kenyans with access to bank accounts faced a relatively limited and inefficient banking system for transferring money. The payments and settlement system was rudimentary and expensive, and therefore most transactions had moved to cash and informal markets to overcome the cost and constraints of accessing banks and other formal financial services.

There were a number of causes for high levels of financial exclusion in Kenya, revolving around the banking system. These included the following:

- Minimum balance requirements for savings accounts;

- Cost of maintaining accounts – high ledger fees that reduced the amount of funds available for savings/deposits accounts; this implies that the technology for managing micro accounts had not yet developed;
- Restrictions on the number of withdrawals per period on a savings account;
- Low levels of income and irregular income flows that made savings in a formal bank account not very feasible;
- Physical distance to the financial service access points; a trip to the bank either to deposit or to withdraw was and is still expensive and adds to the barriers to entry;
- History of weak regulatory technology and capacity that led to collapse of banks, and leading to a dark history of institutional failure and policy failure;
- Weak legal framework and incomplete financial infrastructure – for example, there were no deposit insurance mechanisms for many years or even information capital to rate good and bad borrowers in banks/financial institutions;
- Customers' information asymmetry on how banks operate/presence of segmented markets and preference of informal market, thus customers run away from costly formality; and
- The participants in these market segments, especially the poor and low income earners, are sensitive to financial products and their delivery mechanism.

Lack of trust in banks and limited innovation of banks was particularly important for financial exclusion and ultimately the launch and success of M-Pesa. In the 1980s, the Kenyan Government sought to introduce innovation in the banking sector by introducing non-bank financial institutions (NBFIs). These actors had lower capital and regulatory requirements than banks and were designed to encourage such actors to reach the poor. The problem is that these lower regulatory requirements led to regulatory arbitrage, in turn creating weak NBFIs and their eventual collapse. The big banks absorbed their NBFIs back into their normal operations but other stand-alone NBFIs owned by Kenyan entrepreneurs/elites collapsed with massive savings from poor Kenyans. The Kenyan public and business community thus held the CBK and the government policy process with suspicion.

Other banks that focused on poor communities failed to do so. In the early part of the 2000 decade, banks that were microfinance-based in Kenya became impatient with the Microfinance Act that was taking too long to become law. They turned into fully fledged banks even though they were initially deposit-taking microfinance-based.

2.2 Policy changes

Policy changes at various levels were underway shortly before the launch of M-Pesa. The new Government that came to power in 2003 had the first ambition to reverse the protracted recession that had span 1995 to 2002. It developed a blueprint for economic recovery for wealth and employment creation, emphasized inclusive growth, but for the financial sector. The emphasis was increasing competition, improving the regulatory environment and reducing the burden of non-performing loans to make the financial sector accessible. The end of this new blueprint for economic management was succeeded by the Kenya Vision 2030. In this long-term strategic focus, Kenya was seen as a financial hub and the financial sector reforms would be speeded up to take advantage of the country's location to become the Eastern African financial hub. There were targets for savings and investment rates for the economy. But now, there were several pieces of legislation required to push the financial sector to the next level - the payments system, the micro finance bill, the mobile phone technology and the regulator, the company law, the communication law and the insurance law for the bank assurance products and also amendments to the existing law to cope with the dynamics of market development. Given this layout, market access was important in the banking sector; the issue was whether to push for a different market formation; the microfinance model was on the table. The legal framework had been passed by Parliament, but guidelines were taking too long to roll out and to be approved by Parliament since they were considered as legal instruments. The other avenue was to encourage the expansion of branch network of the existing banks. The discussion with Kenya Bankers' Association (KBA) was on how to develop a cost-effective branch outlet structure as a delivery model for financial services to poor urban and rural locations.¹

The Central Bank of Kenya (CBK) was also taking actions to develop Kenya's financial system, focusing on payments. In 2003, the Central Bank of Kenya Act was amended to enhance CBK's mandate to, "*formulate and implement such policies as best promote the establishment, regulation and supervision of efficient payment, clearing and settlement systems.*" This was therefore an additional core mandate of the Central Bank. This mandate also required the CBK to ensure that risks associated with innovation and technologically-driven financial services were adequately mitigated.

The Communication Bill was passed by Parliament and recognized electronic signatures and electronic units of money. This was a great boost to the national payments and settlement system and also to the developing concept of M-Pesa, as discussed in the next section 2.

1 The initial discussions that I held with KBA and a few Chief Executive Officers (CEOs) of big banks in my first few weeks as Governor was for them to develop proposals to expand branch outlets and reduce cost outlays of brick and mortar settings model as a future proposal, but it seemed distant to them. The cost outlay consideration was the best bet at the time but no proposals were developed by KBA along these lines. I mentioned agency banking.

3

INITIAL EXPERIMENTS AND POLICY FRAMEWORKS

3.1 Initial experiments

The basic beginnings of M-Pesa can be traced back to 2002 when Kenyans started trading with airtime. This was a simple way of buying bulk airtime as sold in shops or in scratch cards and then slice into small units to sell or to settle debts or even to share with friends and relatives when they ran out of airtime. In 2005, actual research by Safaricom on the product started. But the CBK engagement with the M-Pesa model commenced at the concept stage in 2004/5. At this time the Commercial Bank of Africa (CBA)², Safaricom, Vodafone, Faulu Kenya (a microfinance institution) and MicroSave (a donor project supporting financial innovation) partnered to pilot a payment service using mobile phones. DfID provided £ 1.0 million to develop the product; this was a matching fund investment through the Financial Deepening Challenge Fund, and Vodafone also invested £ 1 million.

Faulu Kenya, a credit only microfinance, conceived the idea that airtime could be used to repay monthly instalments of loans they advanced to its customers without a trip to the city or towns where the branches of Faulu Kenya were, for those small repayments. The problem then was that they needed some form of bulk or aggregators of pre-paid airtime sellers to work with Safaricom to translate the pre-paid airtime into cash for the microfinance and effect the repayments and servicing of the loans contracted. The initial constraint by Faulu Kenya customers was repayment of loans by monthly instalments because it was expensive to travel to towns where branches of Faulu Kenya were. The idea was to make these small payments by purchasing and sending prepaid airtime. Therefore, the M-Pesa project then revolved around sending pre-paid airtime as instalments for loan repayments

2 The bank merged with National Industrial Credit (NIC) bank effective October 1, 2019 to NCBA, see CBK press release dated September 27, 2019, https://www.centralbank.go.ke/uploads/press_releases/12036447_Press%20release%20-%20merger%20of%20CBA%20Limited%20and%20NIC%20Group%20PLC_.pdf.

and then partner with Safaricom for aggregators of these airtime payments to be transmitted to Faulu Kenya to effect loan repayments for their customer accounts. The network of Safaricom Agents who were airtime sellers would be used in the piloting and product development stage. This means that initial M-Pesa was conceived of entirely as a way to improve the efficiency of Microfinance institutions and extend their reach to more customers and more remote locations” (Vaughan, Fengler and Joseph, 2012).

The research and pilot that commenced was boosted in 2006 by the passing of the Communications Act. The pre-paid airtime model was abandoned since money could be transformed now into electronic units of money and exchanged at par value.

Over that time, the CBA kept the CBK updated on the pilot scheme. This was appropriate given that the CBA was regulated by the CBK. In addition, for licencing purposes, the initial M-Pesa was a bank product for which the CBA would be partly responsible.

In August 2006, Safaricom approached the CBK to propose a nation-wide launch of M-Pesa. The trials had worked well and Safaricom believed there was potential significant economic value in launching M-Pesa. Safaricom also engaged in discussions with the Communication Commission of Kenya (CCK), and the Ministry of Information and Communication who had a dynamic Permanent Secretary by the name of Dr Bitange Ndemo, and the private sector players.

At the time, there was significant opposition to the launch. There was severe resistance among members of the CBK and other commercial banks. By the time I joined the Central Bank as Governor in March 2007, the piloting had produced some comfortable outcomes but the real launch of M-Pesa as a bank product had not been resolved or even discussed at the Central Bank. I was approached by different stakeholders, and my own deputy then warned of massive bank failure if the M-Pesa was allowed into the market. I kept an open mind and listened to all stakeholders, including those who had no stakes, but in the process there were more positive merits of the product than the perceived risks.

For me to proceed, I requested for a demonstration of how the product would work in the market and all stakeholders of M-Pesa were present. I requested for forthrightness in asking questions especially by my colleagues from the Central Bank and ministries of Finance, and Information and Communication so that we could arrest any fears relayed in the market about this product using mobile phone platform for financial services.

The discussion below outlines the proposed operation of M-Pesa. Safaricom delivered the outline of the scheme over 2006.

3.2 The operation of M-Pesa

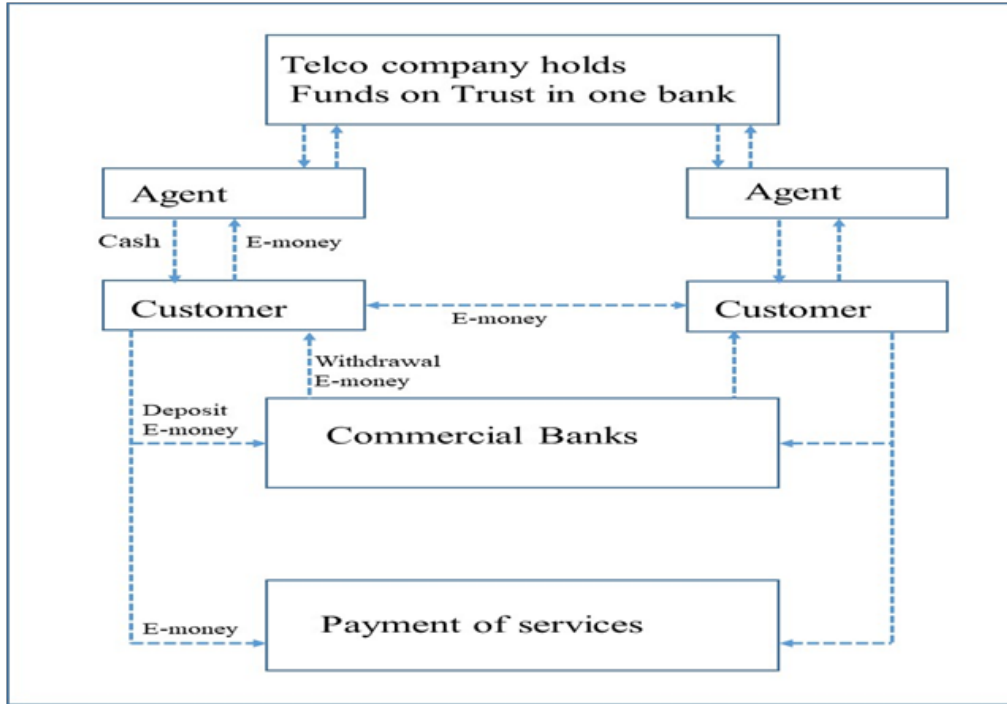
Customers would buy and sell M-Pesa electronic money (e-money) from 'Agents' of Safaricom. M-Pesa Agents included airtime sellers, shops, petrol stations, supermarkets, post offices, commercial banks and other financial institutions, chemists and other retail outlets. The Agents played a crucial role in the model as they were responsible for registering new clients, receiving deposits and making payments from client accounts.

Deposits and withdrawals operated in the following way:

- To buy M-Pesa (deposit cash), the agent transfers e-money to the client and the client pays the Agent;
- To sell M-Pesa (withdraw cash), the client transfers e-money to the Agent and the Agent gives cash to the client; and
- Using the SIM Toolkit, clients could also transfer M-Pesa e-money to each other. A short message service (SMS) from Safaricom would inform clients' of the transaction's success.

A key issue was how funds from the public would be stored in the M-Pesa system. All the e-money managed by M-Pesa was backed by real money in a trust account held in a commercial bank (we discuss later the requirements and the choice of a trust account). The requirements in this trust account or payments platform was that the total balance should always match the amount in the total M-Pesa e-money account. The account was held by a Trust Deed specifically set up to manage the funds, which could only be used by clients of M-Pesa. Safaricom could not access or use the funds held in the Trust Account. During customer transactions, no money would enter or leave the M-Pesa trust account. Agents would purchase e-value by depositing cash in the trust account. Figure 3.1 demonstrates schematically how M-Pesa operates.

Figure 3.1: M-Pesa operations



Source: Adopted and modified from “Regulating Mobile Money: A function Approach, Greenacre (2018).”

Customers would use M-Pesa services to send e-money to each other, to send/deposit e-money to their commercial bank accounts or withdraw (if they had subscribed to that service) and to make payments for services using paybill or buy goods options.

3.3 Risks and their mitigation

Before permitting Safaricom to launch M-Pesa, the CBK carefully reviewed the original service to identify key risks and how to respond to them. I argued at the time that legal provisions and even legal amendments would always lag behind innovations and dynamism in the market. It was therefore necessary to use the CBK avenue of issuing guidelines to the market as stop-gap measures rather than stifle market innovations and market developments. Several important issues required consideration.

3.3.1 CBK’s authority and resources

A key first step involved determining the ability of the CBK to issue guidelines on time to regulate and re-direct the market and its developments. It was not until 2003 that an amendment to the Central Bank Act gave the CBK a discretion on national payments to formulate and implement such policies as best promote the establishment, regulation and supervision of efficient and effective payments,

clearing and settlement systems. From this amendment, an effective and efficient payments and settlement system became vaguely an additional core mandate of the CBK but with no legal framework to enforce it or to draw guidelines for the market. This is the position CBK found itself in when Safaricom and Commercial Bank of Africa (CBA) were developing M-Pesa and requesting the CBK to authorize a roll-out of a mobile phone-enabled money transfer/remittances and payments system that had evolved from the original concept of using pre-paid airtime service. But as has been shown and a lot of write-ups have been devoted on this aspect, the CBK requested Safaricom and CBA for risk mitigation in all aspects.

The CBK's regulatory authority over payments emerged over time; for example, the provisions of the Central Bank of Kenya Act whose mandate was expanded in 2003 to include **Section 4A 1(d)**, which *inter alia* mandates the Bank to formulate such policies as best promote the establishment, regulation and supervision of efficient and effective payments, clearing and settlement systems. Pursuant to this mandate and in a bid to adequately cater for the modernization of the payments system, the Bank formulated and proposed the enactment of the National Payments System Act. While the proposed Act will address low value retail payments systems such as M-Pesa, it will also provide for Large Value Payment Systems for inter-bank payments such as the Kenya Electronic Payments and Settlement System (KEPSS), which is a Systemically Important Payment System (SIPS). Further to this mandate and to operationalize the oversight function, the Central Bank developed an Oversight Policy Framework document on payments system in Kenya.

The capacity and capability at the CBK to deal with these innovative demands was crucial. A technical team from a cross-section of departments in the CBK that covered banking, a new division of National Payments System (NPS), bank supervision, and the legal services was formed. This technical team was supposed to be operational and advisory. The team reviewed the application by Safaricom-CBA and drew implications and consulted the Communications Authority (CA). They also did a comprehensive review of market developments and above all made sure that the CBK did not stand in the way of innovators who would possibly bring the much needed revolution in financial inclusion in Kenya. Therefore, from the onset, the leanings of the CBK and indeed my own inclination were clearly in favour of this evolution and innovation. This undoubtedly did not go down very well with some officials of the Ministry of Finance, my own Deputy Governor and the Kenya Bankers Association (KBA), as we will show later.

Over the course of collaboration and training, the CBK developed a clear policy intention for considering how to address the regulation of M-Pesa. The CBK argued that M-Pesa was a bank product that was unique in that it was a partnership between a telco and a commercial bank. The telco (Safaricom) provided the transmission function of funds via the mobile phone. Another was that M-Pesa would be a high

volume of participants and transactions, but have a low value retail payment transfer system. Ultimately, the entire set up, in a summary, was to provide the payment platform and also liquidity distribution among Agents that was efficient, effective and transparent.

The CBK analyzed several basic risks to arise through M-Pesa and designed methods of addressing them, subject to the policy intention discussed in the paragraph above. The following section examines general risks and Section 2.3.3 focuses particularly on protection of customers' funds stored within M-Pesa because this topic required particular regulatory innovation.

3.3.2 General risks

- **Settlement risk** – the risk that the flow of funds between transacting parties would fail or would be delayed owing to credit, liquidity and operational risk or use of a risky settlement medium that would not coordinate delivery and payment. The mitigation required that Agents of Safaricom would settle through the trust account at the Commercial Bank of Africa and since M-Pesa was a high volume low value retail payment system, settlement in a sound commercial bank was deemed adequate. In authorizing the M-Pesa service, and bearing in mind settlement risks, the CBK placed maximum limits on transactions. Later and gradually, these limits were revised upwards as confidence was boosted and payments platform was diversified to other banks.
- **Foreign exchange risk (Herstat risk)** – the risk that one party to a foreign exchange transaction would not receive the foreign currency it paid for. Safaricom had proposed a foreign remittance service that required mitigation of this risk. The CBK reviewed the application and advised Safaricom on the requirement of this service in line with the provisions of the Central Bank of Kenya Act.
- **Legal risk** – the risk that unexpected interpretation of the law or legal uncertainty would leave the payment system or members with unforeseen financial exposure and possible losses. In mitigating this risk, the CBK considered that Safaricom as a mobile service provider was licensed and regulated by the then Communications Commission of Kenya (CCK) and was therefore under the provisions of the Kenya Communications Act 1998 and the amendments in 2006. The legal relationships with respect to money transfer are provided for in various agreements that were reviewed by the Central Bank of Kenya. In addition, there was recognition that this innovative service would be a value added on the licensed mobile services and as a money transfer service, it would benefit from the existing oversight mandate of the Central Bank of Kenya. This would further be enhanced by the enactment of the proposed National Payments System Bill.

- **The Anti-Money Laundering (AML) and Combating Financing of Terrorism (CFT)** – from the outset and even before authorization, Safaricom was advised on the requirements of AML/CFT. In this respect therefore, Safaricom continued to mitigate this risk through legal instruments, training its Agents, monitoring the system for suspicious transactions, and enforcement. In addition, Safaricom observed AML/CFT policy requirements of Vodafone. Just like any other institution in Kenya then, Safaricom would await the enactment of the AML Bill, the terrorism financing law and the institutions to safeguard and protect the market, the Financial Intelligence Unit (or Financial Reporting Centre as Kenyan Law later defined it), where all reports on suspicious transactions would be reported and actions taken.
- **Operational risk** – the risk that hardware or software problems, or human error, or malicious attack would cause the system to break down or malfunction, giving rise to financial exposures and possible losses. The comfort was that Safaricom being part of the Vodafone group, an international and reputable multinational in the provision of mobile technology, the M-Pesa product would continue to benefit from research and development of Vodafone. Operational issues were regulated by the CCK, now CA. The CBK would continue to receive reports on operational issues on a monthly basis. The CBK also emphasized the need for Safaricom to ensure adequate disaster recovery and business continuity arrangements.
- **Systemic risk** – this was a payment solution fully backed and comprised a small proportion of the payment system. To date, the mobile phone payments in total only comprise 5.5% of total national payments. Therefore, it was not significant and since it was fully backed up it did not pose any systemic risk in the payments system. Systemic importance requires particular consideration. Even at present, the risks posed by M-Pesa continue to be within levels considered not systemic. Though it has a high volume of participants and transactions, M-Pesa is a low value retail payment transfer system. The CBK continued to engage Safaricom around risk mitigation measures to ensure the continued safety and efficiency of the service. The measures were then set:
 - Limiting the size (value) of the mobile transaction; this was set at Ksh 35,000 (US\$ 350) per transaction at any one time.
 - The SIM card could not hold more than Ksh 50,000 (US\$ 500) at any one time. This maximum limit would discourage the SIM card holders from making it look like an alternative bank or holding account.
 - There were daily limits on transactions and only two transactions were allowed at the limit of Ksh 35,000 per day. This made sense for monitoring AML/CFT regime in Kenya. During this time, even with all these developments and innovations taking place in Kenya, the AML/CFT regime in Kenya as per the

Financial Action Task Force (FATF) classification was considered inadequate (in subsequent years Kenya was placed under the ‘dark grey’ list with possibilities of counter measures). For this reason, stringent measures were put in place at the time to adhere to AML/CFT requirements at the bank and at the M-Pesa platform levels³.

However, the thresholds limits were increased later on due to market pressure as more and more joined the payments of goods and services categories. At first, the Central Bank escaped the pressure of raising the limit by arguing that Safaricom should increase the number of Agents since transactions value were still low but later, as transactions value increased due to entry of utilities that boosted the functionality of payments for goods and services, the limits were increased and in the subsequent years 2010-2011 a super user category (and also the original concept of aggregators) with no limits was introduced for specific Agents, bank tellers and supermarkets point of sales. But in addition, the technology has supported a better and more efficient AML/CFT monitoring framework and also the Know Your Customer (KYC) tiered approach has supported the CBK’s risk-based approach appropriately. As it stood, M-Pesa had accomplished its objectives and reduced the fear in the market of systemic risk and that perhaps was going to drive further innovations in the market.

Protection of customers’ funds with cash merchants required particular attention from the CBK. Two risks were particularly important.

- **Credit risk** – the risk that a counterparty may fail to meet an obligation for full value either when due or at any time thereafter.
- **Liquidity risk** – the risk that a counterparty would not settle an obligation for full value when due, but at some time thereafter.

In consultation with the CBK, the M-Pesa model addressed credit and liquidity risks through Agents in a number of ways. To address credit risk, Agents would prepay before offering services to the customers. The Agents would sign to agreements enforced by Safaricom and also agreed with the CA and for which the CBK had an input.

3 I recall in 2014 FATF Plenary in Paris I argued in defence for Kenya financial system that had been placed in ‘Dark Grey List’ for countries with inadequate AML/CFT regimes, that M-Pesa platform had allowed informal transactions to move to formality and that they could be monitored. In my argument then, M-Pesa was fighting informality of financial market transactions and that informality was more dangerous to the AML/CFT regime for Kenya. The view held about M-Pesa was completely the opposite. My view was well taken. I argued that Kenya and indeed the African continent, the informality of markets and financial exclusion was more dangerous for AML/CFT regime. This point was appreciated and explains why FATF criteria has now pushed for financial inclusion agenda to improve AML/CFT regimes.

Safaricom addressed liquidity risk at Agents by employing stringent vetting criteria that included entities that were financially sound. As at September 2008, the Agents were distributed as follows: Commercial banks (3.9%), Postal Corporation (2.2%), Supermarkets (1.5%), Petrol stations (1.3%), Shops (24.5%), Airtime sellers (60.7%), Savings and Credit Cooperative Societies - (SACCOs) (3.2%), Courier companies (0.9%), and Chemist shops (0.9%). Subsequently, and following discussions with CBK, other participants such as commercial banks and Automated Teller Machines (ATMs) were included.

Other regulatory developments were also relevant. For example, in 2006 the Communications Bill recognized in law the electronic signature and the electronic units of money. Therefore, a new product that would turn cash into electronic units of cash was now legitimate and therefore the mobile phone SIM cards would store value. The old concept of pre-paid airtime was thus modified to fit with these new developments. From a market reception point of view, those who participated in trading with pre-paid airtime became the ready market for early adapters of this new product M-Pesa. Perhaps this has been a challenge in other countries because the concept of Agents network exchanging cash for electronic units of cash was not well understood.

3.3.3 Protection of customers' funds through trust account

The CBK's classification of M-Pesa as a banking product is particularly important for protection of customers' funds. The CBK and CA agreed on the basic regulatory framework on this understanding. In most countries that seem to have failed to take off in Digital Financial Services (DFS), they have described the Kenyan model as 'Telco-led model'. However, they have failed to see through it that if telco did not partner with the banks, then this model would not have worked. But more importantly, at the end of the process, M-Pesa was a bank product and the telco was a partner in the investment and was also providing an efficient transmission system. This point has been overlooked and therefore quite misunderstood.

Regulatory innovation was also needed in regulation because there was no national payments and settlement law in Kenya. This was a particularly thorny issue in Kenya and in 2009, the Central Bank of Kenya through the support of Financial Sector Deepening Kenya and the Bill and Melinda Gates Foundation contracted Bankable Frontiers to develop the National Payments System (NPS) draft guidelines. We called them 'draft guidelines' because the NPS Act had not been passed by Parliament as a legal framework to back the guidelines. But the CBK used the 'draft guidelines' to regulate and protect the market.

The idea was that the M-Pesa trust account would be efficient with several layers of insurance and the trust law would be adequate to protect the payments platform. It would be viewed as a deposit account in the commercial bank where the Central Bank

had adequate regulatory capacity and control over commercial banks. But also, telcos would have no access to the funds, they were just transmitting the funds to the trust account. The CBK would prescribe from time to time guidelines on residual balances that would earn interest but now under the Trustees. Initially, it was guided that such funds could only be withdrawn and used for corporate social responsibility (CSR).

Safaricom's Agents would deposit money in a trust account managed under trust law in Commercial Bank of Africa. Safaricom could not access these deposits, which were ring-fenced under the trust deed and as per guidelines the CBK prescribed and were later adopted by the National Payments System Regulations. The money in this trust account is not under the control of Safaricom and cannot be employed for purposes such as lending, investing or in any other manner for the account and at the risk of Safaricom as per Section 2(1) of the Banking Act. This is like reverse engineering - the guidelines were based on the workings and experiences of M-Pesa and they would now come back not only to influence the regulatory process but also the DFS policy.

The Trust Account addressed the credit and liquidity risks in the following manner:

1. Credit risk

The model allowed Safaricom to issue electronic money in exchange of cash at par value and was stored in the SIM card for the customer. Once the electronic money was stored in the SIM card, it was simultaneously loaded into the trust account at the CBA and this account was under the custody of trustees. The rules around the trust account is provided in the trust deed. Various legal instruments pertaining to this service, including the trustee deed, were presented to the Central Bank for review prior to the launch of this product. Further to this, funds in the trust account deposited in the Commercial Bank of Africa are regulated by the Central Bank of Kenya under the Banking Act. In the description, Trust Deed "Between M-Pesa holding company (trustee) and M-Pesa participants" details the aspects of this service where the Trustee holds funds on behalf of all M-Pesa System Participants under a Declaration of Trust (the Trust Deed). Highlights of the Trust Deed are:

- The Trustee holds all amounts which constitute the Trust Fund on trust for the System Participants.
- The beneficial entitlement of each System Participant to the Trust Fund at any time shall be to such amount of the Trust Fund in conventional money as is equal to the amount of E-Money in the M-Pesa Account of such System Participant at such time.
- Safaricom is entitled to levy certain charges on System Participants for the operation of the service. Where it does so, the M-Pesa Account of the relevant

System Participant will be debited by the amount in E-Money of the relevant charge and a M-Pesa Account of Safaricom shall be credited with the relevant amount.

- The amounts constituting the Trust Fund shall be held by the Trustee in Commercial Bank of Africa.
- Safaricom undertakes to the Trustee and to the System Participants that it will not issue any new E-Money other than in return for an equal amount in conventional money being paid to and received by the Trustee.
- Safaricom shall also not effect any transfer of any E-Money from any M-Pesa account of an amount which exceeds the credit balance of E-Money in the relevant M-Pesa account.

2. Liquidity risk

Trust account addressed liquidity risk by storing funds (trust assets) in a bank account. Assuming the liquidity and solvency of banks, customers' funds should always be available – in liquid form – to address liquidity problems that might arise through the M-Pesa service.

The basic M-Pesa trust arrangements have been used widely. For example, even when the NPS Act was finally passed and the CBK developed and rolled out the guidelines, we still find to date new products coming into the market partnering with banks and opening trust accounts as the preferred payment solution platform. Perhaps it is still seen as the most robust platform to support payments solution in Kenya. This means that it was still the best platform for e-money distribution because it allows Agents in all corners of the country tied to a payments platform to provide financial services with ease. The conclusion to make then is that Safaricom and CBA supported by the Central Bank of Kenya generated ideas and developed a versatile payments platform that has stood the test of time. Looking at literature and subsequent research that has taken place since its launch, this platform adequately demonstrates that transactions can take place effectively, efficiently, in real time and can be easily traceable and monitored (by the regulator for systemic concerns, safety and soundness and also for AML/CFT purposes).

Safaricom supervised and regulated its Agents. It has been a major lesson for the network of Agents who formed the point of service countrywide. The Agents' network by Safaricom formed the backbone of investment for M-Pesa to work and serve the Kenyan population. The Central Bank of Kenya regulated commercial banks and so the trust accounts. Therefore, once money is stored in the SIM card and also simultaneously in the trust account, only the account holder can access the money, just like a normal deposit account in a bank – in this case what changed is the use of the mobile phone rather than physically walking to the banking hall and filling

request forms to the teller to transfer or pay for goods and services. The M-Pesa Agents' network has dynamically developed to form a formidable set of financial access touch points with different layers of responsibility and complexity to distribute e-money liquidity effectively, efficiently and transparently.

CBK authorized other Mobile Network Operators - MNOs (Airtel, Orange and Yu) and Payment Service Providers (Tangaza and Mobikash) followed soon and launched their products. But they followed a similar model that Safaricom had created with CBA; it became the norm. But now, more policy issues began to emerge, as the joining telcos needed to create their own Agent networks and partner with other banks. This of course is where the initial investment and capacity seems to matter. The banks with partnering arrangements negotiated to link their customers' bank accounts with the mobile phone and to M-Pesa. At the end, first generation digital financial services (DFS) banks had linked up with mobile phone users and the mobile phone money transfer ecosystem. In the meantime, other telcos wanted a share in the market and therefore required the regulations and the market environment to be levelled for their easy entry.

3.4 Policy considerations

There were several policy challenges that the Central Bank team faced:

- The first policy challenge was conformity; that is, to make sure the proposed M-Pesa product was not, by legal framework, defined as a banking business and deposit taking. This in a sense divided the process into two where one dealt with M-Pesa Agents exchanging cash into electronic units of money, which was not banking business. The second process was the transmission of those funds to CBA Trust account that was a deposit account as well as a payment platform which was banking business with the regulatory mandates of CBK. The Agents showed and advised that in the first process, the design of M-Pesa did not fall within this legal definition of deposit taking or a place of banking business. For this to be full proof and conform to the definition, the CBK had to make sure that M-Pesa funds were not being intermediated or accessed by Safaricom, but also demonstrate that the transactions between the Safaricom Agent and an M-Pesa customer was just like a shopkeeper – only that the Agent was exchanging electronic units of money with cash while the shopkeeper exchanges physical goods for cash but it was the same philosophy. This distinction has been quite important to date both in Kenya and outside, and mostly in those countries that have not managed to replicate the M-Pesa model. But in Kenya, what perhaps makes the difference is that the law recognized electronic units of money. This of course made it easier for the CBK to define the banking business and deposit taking more appropriately in terms of what M-Pesa model was capable of doing and therefore gave M-Pesa product a good start. In addition, the telcos and Safaricom were not in contact with these funds at all and therefore were not in the banking business.

In the meantime, telco-agency model required further clarification and restrictions. There were four aspects of the CBK's legal opinion relating to the Safaricom Agents' operations:

1. At the point of conversion from cash (bank notes and coins) to electronic units of money, the exchange was at par value – that is the electronic units of money was equivalent to the cash provided.
 2. The electronic value of the cash exchanged would be reflected in the mobile phone account.
 3. This amount in the mobile phone account could only be accessed by the account holder and would remain under the control of the mobile phone account holder.
 4. The conversion from cash to electronic units of cash was not under any terms, with the Safaricom Agents taking cash as would be the case in a bank account where a deposit is made with specific defined terms that have legal obligations.
- The second policy question was more operational and related to safeguarding M-Pesa product and the M-Pesa model from myriad of perceived risks (see section 2.3.2 for the risks). The CBK had to make sure it was a low risk money transfer system and these risks would not in any way be systemic then and in the future. The reaction by the CBK was to list quantum and other measures that would even lower the risk profile even further as already described in section 3.3.2.
 - Finally, the CBK required the CBA and Safaricom to provide monthly returns that would allow the CBK to monitor average transactions, average residual balances and inactive accounts.

Surprisingly, after the demonstrations and technical details of how the product worked, and once we resolved our plans, there were no substantial questions beyond the rumours in the streets. We therefore agreed that all risks, due diligence and supervisory/regulatory issues had been adequately addressed at the piloting stage to allow a launch and continuous monitoring. I boldly blessed the project and in doing that the CBK approved M-Pesa to be launched in 2007. As I made my remarks in that meeting, I strongly emphasized that this would form a technological platform for a menu of financial services that would solve the access problem in the financial market – that has to date not been disapproved⁴ and has formed the first phase of DFS.

4 These issues will be emphasized later since the regulatory side was satisfied but some senior Treasury officials and the big banks under the cover of the Kenya Bankers Association (KBA) were quite uncomfortable and they would wage a war on CBK and M-Pesa much later.

EVOLUTION IN USE

This section describes the initial growth of M-Pesa, response from banks, and an initial review of the system.

4.1 Initial growth

The picture that was emerging was an imposing network of Safaricom Agents, the imposing green colour of Safaricom and heavy advertisement on ‘send money home by M-Pesa’ and no one mentioned the CBA at all. The words ‘Ponzi game’ and ‘Pyramid scheme’ were used mostly by those who had not entered or used the service. But behind the scenes, the CBK, Safaricom and the CBA (at least) knew how the customer funds were protected, ring-fenced and how the model worked.

The reception by Kenyans, given the confidence and the heavy advertisement by Safaricom, witnessed a tremendous growth not only on customer base but also increasing transactions.

What seems to explain this phenomenon growth and capacity of M-Pesa? In the first 12 months of M-Pesa operations, the number of Agents increased from 307 in March 2007 to 2,329 in March 2008. This is more than two times the number of bank branches in Kenya. By August 2008, the number of Agents had increased to 3,761 (Table 4.1). The most striking is the number of transactions and the average value of transactions from the very beginning. By the end of March 2007, the month of the launch, there were 21,714 transactions and by April, the number of transactions had more than tripled to 69,740. By December 2007, the monthly transactions were over 1.2 million and by August 2008, after one year of M-Pesa operation, the total monthly transactions stood at 6.3 million valued at Ksh 16.8 billion (close to US\$ 25 million) but the average transactions value still stood at a low of Ksh 2,916 (close to US\$ 40 then) per transaction. Even though individual transactions were low value, the number of accounts increased and the number of transactions increased in volume. In addition, the number of accounts and the number of Agents providing the services increased.

To improve on management of transactions, speed and risk mitigation, Safaricom constantly reviewed the technological capacity and capability while at the same time the CBK encouraged the diversification of the trust account to other banks. But before we go into this direction that shows how the model of M-Pesa dynamically improved its base, it is important to point out that this was not without challenges. The CBK had to deal with various complaints from members of the public and Kenyan parliamentarians. Most of these complaints centred on speed on M-Pesa transactions (especially on Fridays when traffic was highest) and continuous constraints on liquidity or float with Safaricom Agents and finally the limit of Ksh 35,000 per transaction, which was considered too constraining. My position and response was that increasing the number of Agents was necessary rather than adjust the limits without other safeguards to protect the market, and that Safaricom was continuously improving on the payments solution capacity.

Table 4.1: Monthly transactions

	Total value of transactions (Ksh million) Accounts		Total number of transactions/ Agents		Average value per transaction (Ksh)
Mar 07	64	0.02	21,714	307	2,965
Apr 07	221	0.05	69,740	362	3,167
May 07	484	0.11	149,986	447	3,225
Jun 07	720	0.18	233,661	527	3,082
Jul 07	1,065	0.27	354,298	681	3,007
Aug 07	1,580	0.43	516,239	819	3,060
Sep 07	2,070	0.64	669,689	960	3,091
Oct 07	2,830	0.85	958,908	1,196	2,951
Nov 07	3,515	1.13	1,221,742	1,379	2,877
Dec 07	3,770	1.35	1,274,098	1,582	2,959
Jan 08	4,059	1.59	1,346,827	1,812	3,014
Feb 08	5,220	1.82	1,739,903	2,067	3,000
Mar 08	6,747	2.08	2,397,498	2,329	2,814
Apr 08	8,390	2.37	3,072,888	2,606	2,730
May 08	10,904	2.72	4,021,265	2,770	2,712
Jun 08	10,917	3.04	4,201,440	3,011	2,598
Jul 08	14,017	3.37	5,381,073	3,378	2,600
Aug 08	16,756	3.73	6,342,413	3,761	2,642
Average transfer amount per transactions					2,916

Source: Central Bank of Kenya

It was necessary to enlarge the network of Agents as this later became a useful network of financial access touch points and also significantly increased employment of the youth – more versatile with the mobile phone operations in addition. The constraints on “float” or liquidity distribution was being handled by Safaricom by introducing aggregators and super user category of Agents. As pressure mounted to revise the transactions’ limit upwards, two fronts were introduced; first, Safaricom improved the tracking and monitoring capacity of the system and then launched the super user category of Agents. These were also called ‘aggregators’ who would help in e-money liquidity distribution without limits for themselves. Second, the limits were revised upwards to Ksh 70,000 (about US\$ 700) and to hold up Ksh 100,000 (about US\$ 1,000) in the SIM card⁵. These two introductions to the e-money services in addition to the rising number allowed more dynamism, more efficiency and reach for the M-Pesa products in the market and reduced any further pressure on the limits set and the speed of transactions.

Coming back to the model of M-Pesa, it has now been described with technical details, and the easiest way to understand it is to relate it to where it started with an innovative idea of using pre-paid airtime distribution model. This was the base of cash in, cash out, airtime top-up provided by a network of Agents supervised by Safaricom on guidelines agreed with the CA and for which the CBK had input. The Agents registered new customers on behalf of Safaricom, and they provided the cash-in, cash-out on the basis of allocated ‘float’ (e-money liquidity), thus they were also Agents of distributing liquidity in the network. But in rural areas and poor urban locations, the Agents were the source of information and operational education for this new model and the mobile phone use – they were the face of Safaricom. This setting is what contributed to the success of M-Pesa and allowed an easy take off. The network of Agents in urban centres, urban periphery and rural shopping centres were distinct in colour and very accessible. The credibility of Safaricom Agents, their visibility, the investment by Safaricom in terms of equipment, training and supervision gave this model the success it has to date. Of course at present and after seeing the success of mobile phone-based financial services and a range of products coming into the market, important issues and institutional frameworks have emerged such as competition issues and safeguards, market dominance, monopoly power, consumer protection and interoperability.

But behind these issues and debate is the illusion that telcos are making massive economic rents due to mobile phone-based money transfer and other products using the platform. The factual position is that this service makes a very small proportion

5 The limits as at October 2020 were Ksh 300,000 (US\$ 3,000) in deposits, maximum daily transactions value of Ksh 300,000 (US\$ 3,000). Maximum amount per transaction is Ksh 150,000 (US\$ 1,500).

of their profits and revenue; actually revenue from voice dominates. The crucial point here is that M-Pesa initially did not have to make money – its value proposition was significantly to reduce churn to competition.

But this does not mean that competition and interoperability are not important and helpful in developing the market further. I have argued later in this paper that interoperability will help increase and grow the market size and individual telcos will capture the market share by the products they roll out into the market. This is because there appears to be a misconception that interoperability will help the late starters capture their rightful share of the market, but the reality is that they will have to roll out their products, their Agents network (or share existing Agents), train the Agents and enter into remote areas still left behind by inadequate networks but also invest in real time payments. Investments in real time payments across mobile networks is what has held back interoperability in Kenya.

Perhaps one can look at the network of Safaricom Agents as an infrastructure to provide capacity for growth in this service as it was planned then, and how it has worked since, including taking advantage of the supporting policies rolled out by the CBK, such as Agency banking model. First, it was a massive investment to build and maintain such a network of Agents with equipment, training and daily surveillance. Perhaps this may explain why other mobile phone operators entering this market have found it difficult to match the investments, but these investments have to be made for meaningful competition to take place in Kenya. In addition, I do believe there was an incomplete strategic grasp of mobile money market by the competitors wishing to enter the Kenyan market and how it was also reflected by the scale efficiencies of Safaricom – it had many more agents, more customers and a complete physical network extensively expanding to cover the country.

In basic models of competition, in the first stage the firms invest in capacity. The capacity invested determines not only its capability but also signals the presence in the market; this is the M-Pesa case. It is important to capture the role of Agents at this stage, since the debate in recent years in Kenya has focussed on removing the exclusivity clauses of Agents rather than the functionality that gave the mobile phone financial services ecosystem the vibrancy that was witnessed. As already highlighted in section two, the role of Agents not only included exchange of e-money and provision of services in the rural areas but also to: register new customers while observing the KYC guidelines. The basic registration requirements were an identity card and address, among other requirements. It is important to recall that when mobile phones penetrated in Kenya, there were no legal requirements to register a SIM card, except if one wanted to open a post-paid account. This also explains why the majority of Kenyans joined the pre-paid airtime service. When M-Pesa started, the KYC guidelines had to apply; this is part of the risk based approach by CBK. On this basis, KYC, the tiered system was then applicable and consistent with AML/CFT regime.

Therefore, the totality of the Agents' network for all the mobile network operators (MNOs) in Kenya has played a vital role to the success of the DFS and the M-Pesa model and the debate can be advanced along the following lines:

- a) A network of financial services providers and points of service outside the commercial banking or microfinance set up.
- b) E-money transfers, payments and settlement network in real time that is transparent, effective and efficient.
- c) The DFS ecosystem can then be used for a variety of purposes given the capacity of the Agents' network.
- d) The number of M-Pesa Agents in Kenya is so far above 200,000 and still growing – beyond any branch outlet of banks that can be thought feasible.

With the success of M-Pesa, it meant that it was a vibrant market ready to be discovered by other MNOs and banks wishing to enter the market. Two outcomes are worth noting at this stage, the CBK had set a precedent for other operators wishing to enter the market. The commercial banks were feeling threatened by this market and the M-Pesa model adopted and taking root in the Kenyan economy. In addition, some banks considered the investment in a payments platform was rather prohibitive for them. This was the political economy at play; the commercial banks started hitting at the CBK using the Kenya Bankers Association and the Acting Minister for Finance in late 2008. Before I show the intensity of this threat and the outcome, it is important to make two points to introduce the power play at hand. First, since the process of launching M-Pesa had worked (it was launched by the then Minister for Finance, Hon. Amos Kimunya) and so far the results had vindicated the expectations of the CBK as well as those of Safaricom and CBA, it was now a fertile ground for other MNOs to try their luck. The CBK had now to purify the framework by issuing a letter of no objection to Safaricom to roll out M-Pesa as a stopgap measure so that it did not appear to stifle innovation. To purify the framework, what was required was a legal framework, a parliamentary registration of the NPS Act and in its absence a set of formal guidelines the CBK could use as mandated by law.

4.2 Initial audit

The CBK had underestimated the threat of M-Pesa on conventional banking system. The concern from the commercial banks was that adoption of mobile money would lead to a “disintermediation and drive down the use of savings accounts in traditional banks” (see Muthiora, 2015). The CBK argued that integration with M-Pesa would support further reach to customers, increase the level of deposits and savings and

therefore raise the scale and intensity of the intermediation process.⁶ In my own words then and in support of M-Pesa, I argued that mobile phone financial services would form a technological platform that would allow banks to roll out a menu of financial products and services that would reach a mass market in Kenya. In addition, this platform would support an efficient system of transactions, managing savings and deposit accounts and disbursing credit. This connection was not seen as feasible by most of the commercial banks. While the tension continued behind the scenes unknown to the CBK, and spearheaded by the KBA (a good cover for big and multinational banks), the then Minister for Finance Hon. Amos Kimunya who had launched M-Pesa in March 2007 resigned and was replaced by Mr John Michuki in an acting capacity towards the end of 2008. The KBA, it appears, had a listening and sympathetic ear.

One morning, I flanked the new Acting Minister in a press briefing after questions arose on economic growth in Kenya, the global financial crisis and the effect on the Kenyan economy, inflation and exchange rate. The Acting Minister did not dwell on the responses to these questions; he turned to me and directed me and the National Treasury to conduct an audit on M-Pesa because the information he had gathered was that M-Pesa would not end well in Kenya. This was hardly encouraging for a Minister of Finance either to the market or to the Central Bank. This caught the CBK and Safaricom by surprise. But it was not a written directive, therefore the minister was playing gallery with the media. The Minister knew that by law, he could not direct the CBK on its operations or mandate. But the law and gallery were two different aspects – Kenya was now at a standstill. I called Michael Joseph and my colleagues at the CBK and made a decision to deal with the issue head-on. What the CBK and Safaricom developed overnight was not an audit but a report to vindicate the success, the risk mitigation and the opportunities of M-Pesa. This was shared with the National Treasury and they were happy with it and they were comfortable to share with the Minister. I followed this report with a draft press release that the CBK would issue to calm and create confidence in the market once the Minister was satisfied with the ‘audit’ report on M-Pesa.

The Minister must have been impressed by the clarity and correctness of the picture painted by the ‘audit’ report and the press brief and perhaps the power to calm the market and also create confidence in this product. He called me to his residence for a discussion and informed me that he was satisfied that the ‘audit’ was an accurate reflection of what was happening in the Kenyan financial market and that M-Pesa was the best product in our financial market and for financial inclusion. He further

6 Data at the time showed that the banking sector had only 4.3 million deposit/savings accounts, only about 700,000 accounts for loans and advances and only 740 bank branches country wide for an adult population close to 30 million in Kenya. This shows that accessibility was a constraint.

indicated that he would be the one to sign the press release⁷. It was a relief to me and Safaricom, and so it mattered little who would sign the press release. I removed my name from the press release and substituted with his, and then it was signed and released to the market. I made sure it reached the KBA and the media as soon as it was signed. The press brief is reproduced here and the detailed audit report in Annex 1 that accurately describes the process and the safeguards including data points of residual balances in the trust account. The press release was a summary of the ‘audit’ report that made the following factual points:

- M-Pesa was not a banking service, it was a low value retail money transfer and payments system.
- The CBK had approved M-Pesa as a bank product on the basis of its adequacy, its legality, and satisfactory risk mitigation.
- It was not a deposit-taking service.
- Its funds were secure in a trust account and not accessible to any other entity.
- The CBK had a close oversight on the product and that it was emerging as a strong instrument to effect financial inclusion in Kenya.

The headlines that followed from the media; “the regulator (CBK) gives M-Pesa a clean bill of health” was a paradox since the CBK never doubted its capacity, operations and even its correctness and effectiveness. This turn of events, perhaps by accident rather than design, gave a resounding confidence to M-Pesa in the market and in doing so other MNOs were confident to succeed. The commercial banks that had spearheaded the war had no option but to integrate with M-Pesa and other similar products being rolled into the market. It is surprising that the Standard Chartered Bank moved fast to negotiate with the Safaricom to host the payments solution platform after this confidence boost. It became the second bank to partner with Safaricom to establish and diversify the Trust account as a payments solution and therefore drive the M-Pesa product in the market. Henceforth, other banks negotiated with Safaricom to link their account holders with M-Pesa, whereby they could draw down from their bank accounts to M-Pesa accounts without having to go to M-Pesa Agents. Slowly, even the microfinance institutions and SACCOs joined in. M-Pesa became the coordinating payments solution across all market segments. The press release is reproduced here:

7 I did not know at the time that other concerned Kenyans had tried to intervene on this issue and had called on the Minister. One documented aspect is where Michael Joseph, the CEO of Safaricom, paid a courtesy visit to the Minister and demonstrated to him how to send money to his farm manager in his rural constituency. He was impressed on how the M-Pesa worked (see Muthiora, 2015)

Box 4.1: PRESS RELEASE M-PESA MONEY TRANSFER SERVICES

The Government initiatives to promote Information Communication Technology and a fully market driven economy with e-commerce has enabled the country make great strides in the area of financial services delivery. In tandem with these advancements, many businesses have tended to leverage on the same and provide value adding services that are not only innovative but have grown to become popular with the Kenyan public. One such innovation is in the area of Money transfer. Kenya is now a world pioneer in the use of mobile phones to transfer Money, following the rollout especially of M-Pesa in March 2007. However, the adoption and growth of M-Pesa services has not only continued to draw public attention but has also generated a lot of debate as to the safety of these kinds of payment and transfer systems. It is necessary then to provide an audit of the system to guarantee comfort on its safety, information about its effectiveness as well as to satisfy the operating platform for M-Pesa and other similar services wishing to enter the market.

The purpose of this press release is to provide insights as to how this innovative money transfer service has developed, how it has enabled the transfer of funds to the unbanked and how the Central Bank of Kenya (CBK) continues to oversee its operations in order to ensure their safety and efficiency.

- 1) At the onset, I wish to reiterate that the Central Bank of Kenya and the Treasury are committed to promoting safe and efficient innovations that enhance access to financial services thereby addressing the challenge of financial exclusion occasioned by infrastructural constraints to formal banking services. Since inception, the number of registered M-Pesa users has grown to about Four (4) million. These users are served by M-Pesa Agents that are spread across the country including remote rural or poor urban areas who previously did not have access to formal banking services. The service has therefore proved to be an effective way of reaching the unbanked members of the Kenyan society. The popularity of the system stems from its ability to transfer values at more affordable rates to the public. So far, the system has maintained an average Ksh 3000 per transfer. In the past, commercial banks have found it not efficient or effective to offer such services. However, it is laudable to note that some commercial banks and other service providers are now partnering with M-Pesa with a view to complementing each other and leveraging on the M-Pesa outreach.
- 2) Prior to the launch of M-Pesa services in Kenya, Safaricom sought authorization from CBK to undertake the money transfer service. In evaluating the proposal, the Bank considered the request on the basis of the safety and efficiency of the services. In addition, precautionary measures were put in place to ensure that the services did not infringe upon the banking services regulatory framework as provided for under section 2(1) of the Banking Act. The service therefore does not:
 - a) Accept from members of the public money or deposit that is repayable on demand or at the expiry of a fixed period or after notice;

- b) Accept from members of the public money for current account purposes that is used for payment and acceptance of cheques; and;
 - c) Employ money held or any part of the money for purposes of lending and investment or in any other manner for the account and at the risk of the person so employing the money.
- 3) The Central Bank has further confirmed that funds to be transferred are held in a trust account in a commercial bank account and is therefore not available to Safaricom for lending, investing or operating as an ordinary bank account as described in section 2(1) of the Banking Act. These funds are held in trust for the benefit of customers. The trust deed provides legal protection for the money in the trust account and provides mitigation against the potential risks customers may be exposed to. Accordingly, compliance with this requirement by M-Pesa continues to be a key oversight objective of the Central Bank.
 - 4) A number of critical issues and risks that have been reviewed include; - liquidity management, settlement risks, the reliability of the system, the registration of users, system audit trail, anti-money laundering measures and consumer protection issues that could compromise the safety, efficiency, integrity and effectiveness of the M-Pesa system. It is also instructive that the CBK has so far not received a report of any loss or fraud through the system.
 - 5) The Central Bank of Kenya has continued to oversee the service in line with these recommendations and its Oversight Policy Framework document on payment systems in Kenya which is available at the Bank's website, www.centralbank.go.ke. For instance, whereas the system transacted about Ksh 17 billion in August 2008, the net deposit/residual value per customer (i.e. deposit less withdrawals) was Ksh 203 thus demonstrating that M-Pesa has not been regarded as an alternative bank account with sums of money staying in the system.
 - 6) To further provide a sound legal basis for payment systems in Kenya, the CBK and the Treasury have been engaged in several legal and regulatory measures aimed at promoting safety, efficiency and effectiveness of payment systems in Kenya. One such effort is the review of the Central Bank Act in the year 2003 to include section 4A1(D) that mandates the CBK to promote such policies as to best promote the establishment, regulation and supervision of efficient and effective payment, clearing and settlement systems. Currently, the Bank has proposed and formulated the enactment of the National Payment System Bill that will strengthen the above mandate by inter alia expressly providing for the oversight of all Payment systems including money transfer services. This Bill will soon be tabled in Parliament for enactment into Law.
 - 7) It is also noteworthy that the recently enacted Kenya Communications (Amendment) Act 2008 expanded the functions of the CCK in relation to electronic transactions and provides legal recognition of electronic transactions. The Act not only legalizes electronic transactions but it also enables the CBK and CCK to work together and

support this system including other such products that may come in future to the market.

This audit by the Central Bank on M-Pesa system provides comfort to the Ministry of Finance and I would like to assure Kenyans that this innovative idea of money transfer through the mobile telephones is safe and the Treasury and the Central Bank will continue to oversee its safety as the innovations in the system and outreach progresses.

MINISTER FOR FINANCE January 6, 2009

In a sense, the audit was the final potential handbrake on the growth of M-Pesa. Once the service had jumped that hurdle, it could grow. And it did, contributing to five generations. I turn to them now.

GENERATIONS

The mobile money growth, supported by policy innovation from the CBK, has triggered a wider financial services revolution in Kenya. I describe the progression and evolution of the mobile money in Kenya under five generations here.

5.1 Generation 1: Initial mobile money growth and financial inclusion

The starting point is to recognize financial inclusion as a public policy to fight poverty. It improves the well-being of all the participants and makes markets accessible. Increased access to financial services to the poor provides a safe haven for their savings as long as those savings are safe and are not consumed by cost of maintaining and servicing the accounts. Most of the poor are target savers and they are efficient in saving-investment cycles. This allows them to widen their economic opportunities, increase their asset base through increased savings and affordable credit and therefore reduce their vulnerability to external shocks; this is savings for consumption smoothing and savings to accumulate capital and thus sustainably escape the poverty trap.

When M-Pesa was launched in 2007, financial inclusion, describing the percentage of the populations' access to formal financial services, was far lower than for a developed country. Just 26.7% of the population had access to formal financial services. Some unbanked and low-income communities had opened micro savings accounts, but a trip to the bank either to withdraw or deposit was a very expensive one. Therefore, the initial target was not to make them banked, but to ensure they participated in the payments system of this new framework. M-Pesa allowed the first entry into the financial system and later allowed the comfort of banking without a trip to the bank.

M-Pesa has had a powerful effect on mobile money. Now, over 86% of the population is within 5 kilometres of a financial access touch point (FinAccess Geospatial Mapping, 2015). Mobile money has underpinned this growth. There are now 30.5 million active registered mobile money subscriptions in Kenya of which M-Pesa subscribers are 30.2 million while Airtel money and T-Kash are 0.344 million as at June 2020 (CAK Q4 report, 2020).

Other mobile money services emerged particularly after the 2008 audit discussed in section 3. Now, the big banks and other MNOs realized they had been left out by the market developments, including innovations that had boosted the market. Other MNOs rushed to register and roll out their products: Zain launched Zain-Zap in February 2009, Essar Yu mobile launched Yu-Cash in December 2009, Orange launched Orange money in December 2010. Therefore, the mobile phone financial services ecosystem was enlarged, and by the end of 2010 there were six (6) mobile money providers and two (2) third party providers – Tangaza Pesa and Mobikash (see Table 5.1). Similarly, other commercial banks that had not sought to partner with Safaricom to establish a similar platform like CBA (there were no restrictions on such moves) after January 2009 started looking for avenues to participate in this ecosystem. It was perhaps the realization that this revolution was unstoppable. The action by the Acting Minister for Finance indirectly and unconsciously opened a new chapter for DFS revolution, confidence and dynamism in the Kenyan financial market.

Table 5.1: The entry of the MFS providers in the market

	Mobile Network Operator cum MFSP	Product	Entry Date
1	Safaricom (K) Ltd	M-Pesa	March 2007 - Current
2	Essar Telecom – Yu Mobile	Yu Cash	December 2009 – January 2015
3	Orange (K) Ltd	Iko Pesa	November 2010 - Current
4	Bharti Airtel	Airtel Money	September 2011 - Current
	Mobile Financial Service Provider	Product	Entry date
1	Mobile Pay Ltd	Tangaza	January 2011 - Current
2	Mobikash Africa Ltd	Mobikash	July 2011 - Current

Source: Central Bank of Kenya

After the initial success of the mobile phone financial services, the risk mitigation and the adoption/confidence in the market, the policy questions had to be addressed. First, I argued that M-Pesa would form a technological platform for a menu of financial services to be rolled out. That is the way I predicted from the available information. But then, what were the initial goals of CBK and the Government in encouraging this product to be developed and tested in the market? Have these goals changed over time or have they been enhanced? To be mild on these issues, it does appear that financial inclusion policy thinking as it was emerging, starting from microfinance whose legal framework was six years behind schedule, and the bank branch network in the country were low and not expanding fast, with the technology for managing micro accounts only being implemented by few banks that were also dismantling the barriers to entry. All these were given a new lifeline by M-Pesa platform. It would later shape further developments and directions on financial inclusion in Kenya. It was a new lease of life for banks because it provided them with an efficient way to effect payments. This then would bring customers to the banks for transactions. It thus formed an efficient technological platform for payments and managing micro accounts for smaller banks.

For the CBK, the goal was and still is to make financial markets accessible and the commercial banks were the easiest entry point to the financial sector, but then what was the problem? I have listed above the barriers to entry in the banking system. M-Pesa was now a product that would overcome not only the barriers to entry erected by commercial banks, but also solve the constraints of geography, physical distances to the banks and provide a technology to manage micro accounts. Second, there was need to fight informal financial services and the totality of informal markets because M-Pesa as a product and as a payments platform was communicating across all markets. We recognize now not only the benefits of financial inclusion but also the benefits of formality of markets for regulators and national security issues, including the AML/CFT regimes. Kenya is a typical African economy with segmented markets and a preference for informal markets. The segmentation is driven by several characteristics but income levels, irregular flows of income, cost of ‘formality’ - structural problems and distance to the market are important factors that impose constraints on market growth in size and location. Third, for the CBK, the only way to increase the capacity for banks to grow in future was to encourage them to grow and increase their deposit base at the time. There were only 4.7 million deposit/savings accounts and about 700,000 loans and advances accounts for an economy with over 30 million adults and 43 banks, as at December 2007. Only one or two banks had developed a technology to manage micro accounts; this would take a long time to influence the totality of Kenyans given the cost to roll out brick and mortar branch outlets. The commitment by both the CBK and the Government to reduce the cost of doing business was then to use the available channels to create a mass market that was efficient and to ensure financial inclusion. That is why innovations in this area received wide approval by the CBK even though other stakeholders were either unsure of the directions that were shaping up or were protecting the available avenues that existed.

To summarize the policy direction at the time, financial development as the CBK perceived it, was shaped by four factors:

1. Banks that would serve Kenyans to help them save and invest – these banks required a large base of depositors to give them adequate capacity in the intermediation process and dynamism of banking products to grow.
2. The strategy then was to encourage banks to grow their branch outlets in rural areas and poorer urban locations and also at the lower end create a category of microfinance institutions at the nationwide and at the community level.
3. The monetary policy regime depended on monetary policy instruments that worked through banks to affect liquidity in the banking sector and its pricing, but a large proportion of currency outside the banking sector made these monetary instruments weak. Published papers on inflation (for example Ndung’u, 1994) had shown that inflation was driven more in the short run by food, energy and growth of outside money.

4. The Government's Kenya Vision 2030 prescribed increased savings and investments rates and that Kenya would become the regional financial hub. Therefore, the starting point was regional diversity, deepen the financial market and then target financial development goals. The process was thus not entirely clear and required time, but it does appear that it was dislodged and given a quick direction by the M-Pesa technological platform that worked from downstream to bring the unbanked to the banks and upstream by allowing banks to grow their capacity through deposits and savings accounts and increasing the activities in the intermediation process.

Box 5.1: Pauline Vaughan, Wolfgang Fengler, Michael Joseph (2010) argue that regulation followed innovation

An important factor in the success of mobile money in Kenya was the progressive role of Kenya's regulators, especially the Central Bank. Mobile money entered a regulatory vacuum. At the time M-Pesa was piloted, no regulations existed for e-money type initiatives, or for the involvement of mobile phone operators in any kind of financial transactions. The operator kept the Central Bank updated on the developments, inviting critique and suggestions through the pilot.

In preparation for a commercial launch of mobile money, Safaricom sought approval from the Central Bank. Safaricom and the Central Bank worked together to address key aspects of payment system regulation including product functionality, legal compliance, stability and redundancy of the technical platform, prudential controls and consumer protection. The Central Bank consulted with relevant governmental and policy bodies, including DfID through their local representative Financial Sector Deepening (FSD). In parallel, Safaricom lobbied the government and notably gained the support of the Permanent Secretary in the Ministry of Information and Telecommunications

Box 5.2: Reflections by Michael Joseph on M-Pesa's critical moments

I firmly believe that the decision to allow Safaricom to go ahead with M-Pesa was firstly because no one really realized or anticipated the phenomenal success that M-Pesa would achieve and the scale of the adoption, and secondly that all parties, particularly the Central Bank, wanted to support innovation and agreed that regulation should follow innovation.

The real key to the success of the M-Pesa rollout and acceptance was the number and geographic spread of the M-Pesa Agents. Not many people, either within or external to Safaricom, understood the concept and the necessity of the number and spread of M-Pesa Agents. Thus, the necessity of getting regulatory approval for the management and appointment of Agents was not sought as rigorously as for the product itself. It was only after the initial success and the concerns that were raised by the traditional banks that attention was then given to getting regulatory “approval” of the Agent structure.

The joint launch of M-Pesa by both Ministries of Finance and Telecommunications, the support by the Central Bank Governor and the genuine innovative culture of Kenyans, both within the Central Bank and Safaricom staff, were the basis of the huge success of M-Pesa and the subsequent defense of M-Pesa by Treasury when the traditional banks belatedly realized the potential impact on their own business.

Personally, I was determined to learn from some of the lessons of the past where I had launched a new product but had not given it sufficient resources or attention to make it succeed. Launching new value added services of such magnitude requires dedication, passion, commitment and imagination even if you are not expecting (as we were) success on the scale we achieved and even if the “business plan” tells you that you are crazy!

Source: Adapted from the Author

The starting point of M-Pesa provides an important background to the above four factors and reflections that seem to document how regulations followed innovation and somewhat complemented the gap filled by M-Pesa.

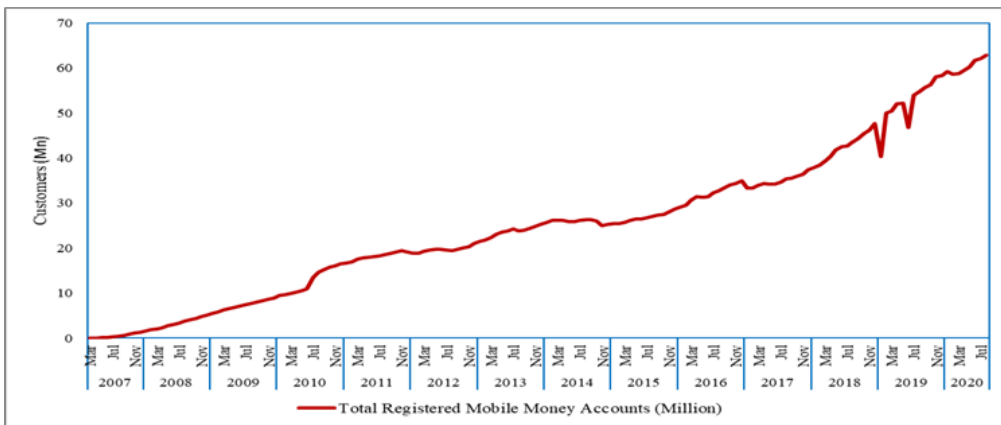
One of the points and perhaps questions emerging from the literature and observations of the DFS in Kenya is that it has not formalized the seemingly large informal market. This was not the objective for M-Pesa. It is important to note that the DFS is being used by formal and complex market structures and informal markets. One can pay for a meal in a five-star hotel using M-Pesa and also pay for a cup of tea in a roadside kiosk using M-Pesa as well. A product such as M-Pesa being used across market segments in Kenya lowers transactions costs considerably and can be considered a success, but it is a matter of time before it becomes the main coordinating instrument across markets both formal and informal. In the long run, the M-Pesa platform will collapse the formal/informal divide.

We do not claim direct attribution but we argue that M-Pesa created the appropriate environment for financial inclusion to take root.

The success of M-Pesa can be looked at in three dimensions. First, M-Pesa through transfers and payments of goods and services supported the development of the national payment system that has become effective, efficient and transparent. Second, the M-Pesa technological platform has become an efficient and effective way for both the micro savers and depositors in managing their bank account transactions. Finally, the M-Pesa technological platform has developed further to allow a platform for short term microcredit that has been efficient and effective without a trip to the bank. Other countries from Africa, Latin America and Asia supported by Alliance for Financial Inclusion (AFI) and other partners visited Kenya to learn how M-Pesa worked and what they needed to do to replicate the same type of DFS platform in their own countries. It is also worth noting that Kenya was one of the founder members of AFI in 2009 and at the time it felt that it had a contribution to make in the developing world to fast-track financial inclusion. I was the Chair of AFI Steering Committee in the first four formative years. Since then, AFI has become a premier network coordinating financial inclusion policies in the developing world of Asia, Africa, Latin America, the Caribbean and the emerging markets. Kenya is seen as a “clearing house” for financial inclusion policy solutions that have worked, have been tested and can be replicated in other developing and emerging economies.

Figures 5.1 and 5.2, and Table 5.2 show the growth of M-Pesa in terms of customers and accounts from the time of the launch to the current. The three sets of information show a combination of M-Pesa Agents growth, the customers enrolling to the system and the level of transactions.

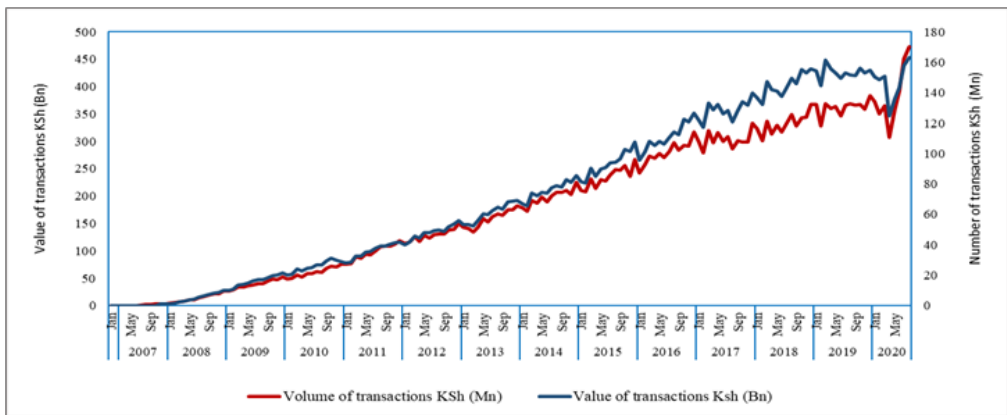
Figure 5.1: Total customers since March 2007 (millions)



Source: Central Bank of Kenya

In Figures 5.1 and 5.2 for example, it shows that the number of M-Pesa accounts increased to over 25 million by 2015. The level of transactions had reached Ksh 206.1 billion per month in February 2015 and over 70 million transactions. By August 2020, the number of mobile money accounts had increased to over 60 million, whereas the value and volume of transactions had increased to Ksh 473.5 billion and 163 million, respectively. The computed daily transactions in February 2015 was Ksh 7.4 billion (US\$ 80.5 million) per day and in August 2020 it had risen to Ksh 15.3 billion (US\$ 145.5 million) per day. However, the average value per transaction has remained relatively low at about Ksh 2,935 (US\$ 32) for both periods in February 2015 and August 2020, implying the payment services has largely remained for small value transactions, as was purposed when M-Pesa was launched in 2007.

Figure 5.2: Value and volume of M-Pesa transactions, March 2007–August 2020



Source: Central Bank of Kenya

The total number of Agents by the end of 2019 was 224,108 and the number of active customer accounts was 58.36 million compared to 6,104 Agents and 5.08 million customers in 2008 (Table 5.2).

Table 5.2: M-Pesa agents, accounts and transactions

Year 2008	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Agents	1,812	2,067	2,329	2,606	2,770	3,011	3,378	3,761	4,230	4,781	5,399	6,104
Mobile money Customers (Mn)	1.59	1.82	2.08	2.37	2.72	3.04	3.37	3.73	4.14	4.42	4.75	5.08
Volume of transactions KSh (Mn)	1.35	1.74	2.40	3.07	4.02	4.20	5.39	6.34	7.15	8.30	8.57	10.21
Value of transactions KSh (Bn)	4.06	5.22	6.75	8.39	10.90	10.92	14.02	16.76	19.27	21.60	21.70	26.99
Year 2019												
Active Agents	201,336	212,252	226,957	230,220	224,825	222,484	222,087	222,479	224,959	223,176	222,211	224,108
Mobile money Customers (Mn)	40.30	50.04	50.36	52.05	52.20	46.80	53.89	54.78	55.70	56.29	58.04	58.36
Volume of transactions KSh (Mn)	154.24	144.49	161.38	155.80	153.26	149.73	152.98	151.83	151.22	156.11	153.06	154.99
Value of transactions KSh (Bn)	368.02	328.15	368.39	360.22	364.25	346.85	366.39	368.50	365.91	366.90	359.26	382.93

Source: Central Bank of Kenya

This figure shows how the M-Pesa Agents and customer base has supported its growth. The entry of other mobile financial services (MFS) providers in 2009 has actually enlarged the market base. However, Safaricom Agents still dominate with market share of 87.5% (221,333 Agents) while other Agents form 12.5% (31,370 Agents) of the market share as at August 2020.

Figure 5.3: Mobile financial services agents

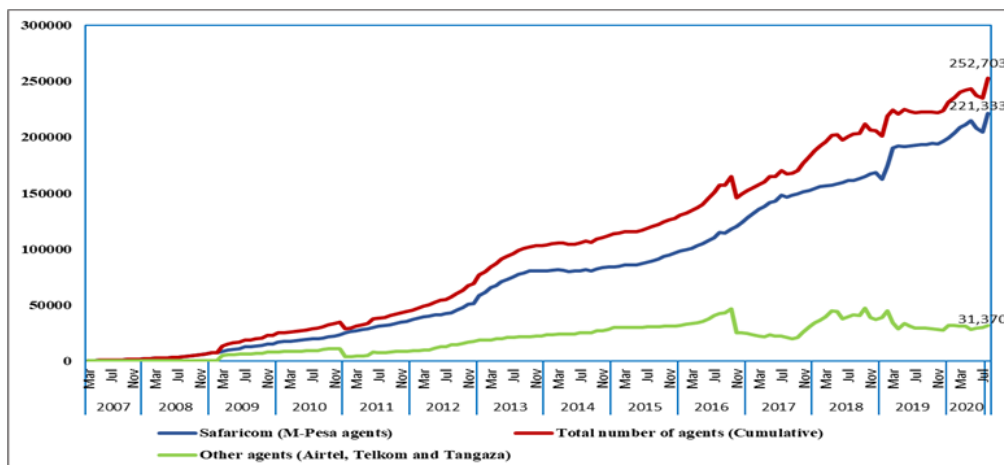


Table 5.3: Financial inclusion profile in Kenya 2006-2019 (% of adult population)

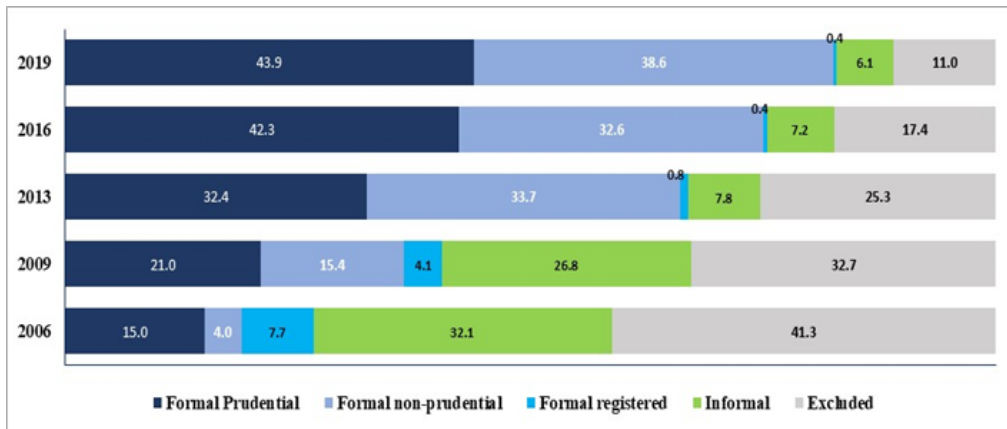
Financial access category	Total %	Rural %	Urban %	Male %	Female %
2006					
Formal	26.7	23.8	35.5	33	21
Informal	32.1	35.5	21.6	26	38
Excluded	41.3	40.7	42.8	41	42
2009					
Formal	40.5	34.6	62.4	48	39
Informal	26.8	29.5	16.5	20	39
Excluded	32.7	35.9	21.1	32	39
2013					
Formal	66.7	59.6	80.0	71	63
Informal	7.8	9.8	4.3	5	11
Excluded	25.3	30.6	15.8	24	27
2016					
Formal	75.3	69.0	86.3	80	71
Informal	7.2	9.0	4.1	4	10
Excluded	17.4	22.0	9.5	16	19
2019					
Formal	82.9	77.3	91.2	86	80
Informal	6.1	8.3	2.8	4	8
Excluded	11	14.4	6.1	11	11

Source: FinAccess Survey (2019)

- In terms of rural-urban divide, financial exclusion has followed the national average, but urbanites have better financial access than their rural counterparts. By 2019, only about 6.1% of the urban adult population was financially excluded compared to 14.4% of the rural population.
- The preference of mobile phone financial services across rural/urban and across gender and age cohorts seems to explain the financial inclusion and accessibility of financial services.

The Kenya's National FinAccess Survey 2009 revealed that 32.7% of Kenya's bankable population is totally excluded from both formal and informal financial services. If 46.0% are poor and 32.7% are unbanked, then most of the unbanked are the poor. Strategies to enhance financial inclusion were therefore seen as critical in efforts to reduce poverty and uplift the bottom billion on a sustainable basis. The FinAccess Survey 2006 had even more depressing statistics. From the 2009 survey, we can thus trace the impact of this policy process and the success that has been seen to date. Figure 4.4 provides a summary of the profile of financial inclusion in Kenya.

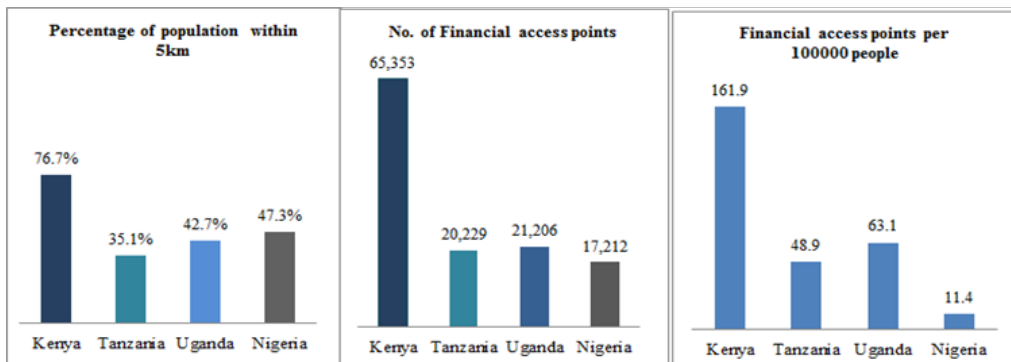
Figure 5.4: Progress in financial access in Kenya, 2006-2019 (%)



Source: FinAccess Survey, 2019

The results from this figure can be analyzed from three dimensions. First, the adult population excluded from financial services declined from 41.3% in 2006 to 11.0% in 2019. Second, the importance of informal financial services significantly declined from 32.1% of the adult population preferring informal financial services in 2006 to 6.1% in 2019. It shows that once formal financial services are accessible, preference for informal financial services declines. Finally, looking at the proportion of the adult population served by formal financial services, it has increased over time from 26.7% in 2006 to 82.9% in 2019. These results show that from whichever dimension one looks at, financial inclusion has been a success story in Kenya. In addition, financial access touch points have been expanding. Kenya is ahead of its peers (Figure 5.5). There is an increase in bank branches, Automated Teller Machines (ATMs), Telco Agents and Agency network for banks that have increased to over 35,000 since inception in 2010.

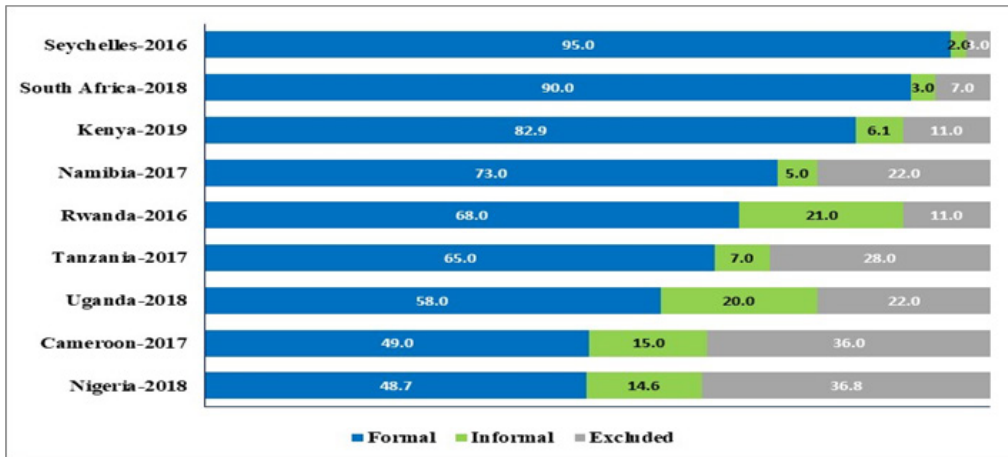
Figure 5.5: Financial access touch points



Source: Country Geospatial Surveys, 2013

Figure 5.5 has three sets of information on accessibility of financial services. First on the physical distance, second on the number of access points and finally on the access points per given population size. The results show that Kenya is ahead of its comparable peers on financial inclusion. Further, in the most recent FinAccess Survey of 2019, Kenya ranks third to Seychelles and South Africa (Figure 5.6).

Figure 5.6: A regional comparison



Source: FinAccess Survey, 2019

Apart from Kenya, growth in usage of banking services is limited. The largest growth driving formality in most countries is the usage of other formal services, which in most cases include mobile financial services just as in Kenya and Agent banking. Of the 10% growth in banking services recorded between 2013 and 2016, 6% is accounted for by new mobile banking products such as M-Shwari and KCB-Pesa. The growth in formality in Rwanda is worth noting. This has more than doubled in just four years from only 19% in 2012 to about 68% in 2016. The growth has largely been driven by both digital financial services and Savings and Credit Cooperative Societies - SACCOs (FinScope, 2016). This expansion is in turn attributed to the Government of Rwanda’s commitment to implementation of national savings mobilization and digitization of government services.

5.2 Generation 2: **Linked Bank Deposits and Partnerships with Financial Institutions**

The second generation saw more investments and new and innovative products emerge⁸. Therefore, the next phase of development was virtual banking system, starting with savings accounts operated under the same platform but now being individualized savings accounts; that is, an M-Pesa account holder would have a direct link to a personal savings account in the same M-Pesa menu in the phone. But more importantly, account holders would be able to use the electronic retail payments to complement financial services, with the emergence of ‘Lipa na M-Pesa’ (pay with M-Pesa) in all retail and wholesale outlets of goods and services.

A key point here is the response and later engagement of banks and other financial institutions with M-Pesa and other mobile money systems that emerged. To move forward with some consistency, I look at the main stakeholders in this game:

- **The multinational banks reaction to M-Pesa:** The multinational banks looked at M-Pesa as a major disruption. Most of these banks were serving and still serve corporate clients and trade financing. But they viewed M-Pesa as an instrument that would drive liquidity from all other banks to the bank holding the payments platform, the CBA. They viewed it as purely loss of business in the interbank market for domestic liquidity where they dominated on the selling side. They therefore warned me of a massive banking crisis in Kenya due to liquidity exodus from all other banks to one small bank holding the trust account, the payments solution platform. They never looked at M-Pesa providing solutions to the payment system and that they would be part of that payment system.
- **The leading Kenyan commercial banks and microfinance-based banks:** The leading Kenyan banks and especially those that had just perfected the technology of managing micro deposit and savings account led a revolution in removing minimum balances and other restrictions on savings accounts. They viewed M-Pesa as an alternative account, so the SIM card was in competition for micro savings and deposit accounts. These banks looked at the convenience

8 I recall having breakfast one morning of September 2008 in Nairobi with Bill Gates and Michael Joseph and how impressed Bill Gates was with M-Pesa and that it had the potential to change peoples' lives in Kenya and beyond. But then he argued that this success was not affecting the banking intermediation process and also would make lasting impacts on peoples' lives if they could save in the banking system but not with the then high transactions costs of transfers from M-Pesa account to a savings account. We assured him that this was the next phase of M-Pesa development. As of now we recognize not just a phase but subsequent incremental and successful phases of innovative developments that have changed peoples' lives

M-Pesa provided, the transparency of costs and effectiveness of charges, hence they envisaged a situation where there would be a massive exodus from micro accounts holders to M-Pesa. My assurance to Kenyan banks and deposit-taking microfinance institutions was that M-Pesa was an appropriate instrument or product (depending on what they wanted to use it for) they should integrate with. In doing so, their customers would not need to visit the bank to withdraw or deposit; they would thus reduce tellers in their banking halls and earn ledger fees 24 hours a day for seven days a week. In short, I advised that M-Pesa would become a better technological platform to manage micro savings and deposit accounts.

- **The CBK, the Ministries of Communication, and Finance and subsequent developments in M-Pesa:** The Ministry of Communication was happy that the telcos were taking part in the money transfer business and that working with and advising the Communications Authority (CA) had made the difference. But in the Ministry of Finance, for the majority of the senior staff it was purely a CBK business and if anything went wrong, the CBK would be blamed, not the Ministry of Finance, save for the support by the Minister, Amos Kimunya, who launched M-Pesa. As shown so far, in the end there were winners only and no losers. Section 2, outlining the internal audit, shows how this audit was addressed.

By using banking data and by tracing deposit and savings accounts growth and banks' branch outlet growth, we show that the market expanded in both branch outlets and deposit accounts. These developments are also supplemented by the growth of microfinance banks and agency banking.

5.2.1 *M-Shwari*

We provide micro-evidence, due to data challenges, by tracing one bank, the CBA from its M-Pesa platform that revolutionized the payments system in Kenya, to a virtual savings accounts platform, M-Shwari, allows savers and records savings and transactions data to form a set of credit scores for pricing credit for each customer. This bank has built virtual savings accounts in 40 months since M-Shwari was launched to cover over 14 million customers, a substantial savings network and forms a base for rising credit demand for short term credit. By January 2019, the customer base was 28.8 million. This micro evidence is also available in CBA's branch outlets in Tanzania (M-Pawa product), a virtual savings and credit supply product like M-Shwari. This provides further evidence of regional impact of DFS in the Eastern African region.

The M-Shwari product was launched by CBA in November 2012 to provide virtual banking services to mobile-centric customers for both savings and loan products.

The objective was to provide simple and affordable financial services through easily accessible channels. It was a visionary product of CBA in partnership with Safaricom, and just like M-Pesa it has made a major mark. The females using the savings product is higher than the national average and the youth (34 years and below) dominate the savings product and credit demand.

Table 5.4: Creating a virtual savings base: M-Shwari

Year	Customers	Deposits (Savings)	Micro Loans
2012	4,786,762		
2013	5,026,955		
2014	7,000,113		
2015	12,459,833		
2016 (Jan.)	17,293,055	US\$ 80,935,428	US\$ 914,499,746
2017	21,462,163		
2018	25,842,902		
2019 (Jan.)	28,782,898		

Source: Commercial Bank of Africa, 2019

After 40 months of operation, in January 2016, total deposits stood at US\$ 80,935,428. The average savings was as low as US\$ 5.3 per month. The total loans disbursed stood at US\$ 914.5 million. The average number of loans disbursed stood at 67,937 and the average loan size at US\$ 31 and the average loan repayment period was 26 days.

The structure and characteristics of savers in M-Shwari is also quite unique. Of the 14.025 million customers, men are 7.35 million, which is 59% of the total customers and women are 5.12 million and which is 41% of the total customers in this product. With regard to age cohorts, those in the age of 18-24 years comprise of 29% of the total customers, those in the 25-34 years age category comprise of 38% and those in the 34-55 years bracket comprise of 25% and those over 55 years are only 8% of the total M-Shwari customers. This shows that 67% of those participating in this mobile-centric banking solutions and taking loans are young people below the age of 34 years. From the time of the launch, this product has registered 10,994 customers per day.

In addition, most M-Shwari customers are target savers and they have a facility to lock their savings for a defined period. The customers with locked savings as at January 2016 stood at 147,213, with an average US\$ 70 of locked savings for an average period of 3.8 months. The non-performing loans proportion for this facility stands at 1.92% compared with the national average of 5.3%.

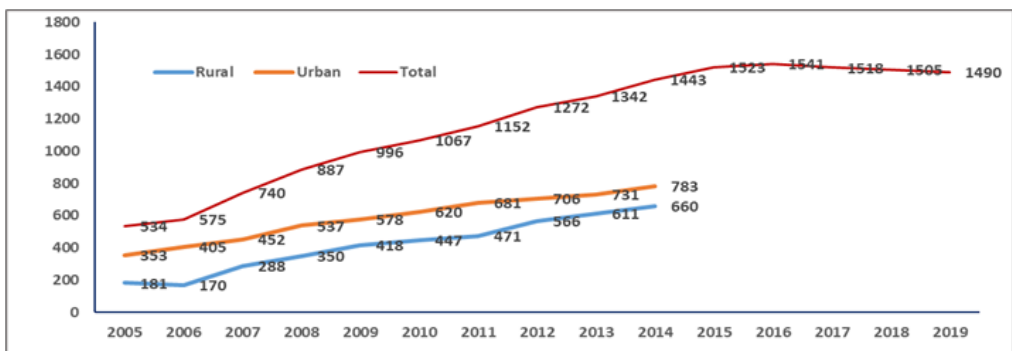
One interesting outcome of this micro impact of M-Pesa and its progression to the five stages of DFS revolution is that it is embodied by this bank, the CBA. It shows

that its partnership with Safaricom and their investment in the payments platform in the initial stages has paid off. The subsequent developments have pulled the totality of the financial evolution with dynamism and efficiency not only in Kenya but also in Tanzania. In Tanzania, the equivalent of M-Shwari is M-Pawa (consistent with empowering the poor to save in a bank account and to acquire short term credit). Finally, the total micro-accounts (those with Ksh less than 100,000) in the banking sector stood at 41.67 million in 2016, and CBA held 17.2 million of those accounts. The CBA held slightly over 40% of the total micro-accounts in the banking sector in Kenya in 2016. This, as we have seen, are massive deposits from target savers that provide the bank with capacity to grow in future and participate strongly in the intermediation process.

M-Shwari and similar products have moved much further, triggering wider bank expansion. The debate on financial inclusion, product design and method of financial services delivery and financial development were now gaining ground not only in Kenya but in other countries with successful DFS evolution, such as Tanzania. In Kenya, the initial fears and regulatory gaps, it appears, had been appreciated by Kenyans. It was no longer an activity outside the mandate of the Central Bank of Kenya.

The success of virtual savings accounts did not also deter the growth of branch outlets; the emerging outcome seems to have been encouraging both physical branches and virtual accounts. We show this in Figure 5.7 on the number of bank branches and the distribution across rural and urban areas in Kenya. The branch outlets have increased from 534 in 2005 to 1,490 in 2019. The rural branch network has not been left behind, either growing from 181 branches in 2005 to 660 in 2015 while the urban branches have grown from 353 to 783 over the same period. The acceleration of branch outlets seems to start in 2007-2008 period. From 2015, official reporting of branch networks by commercial banks changed from 'rural and urban' to reporting branch networks by 'counties'.

Figure 5.7: Growth in branch network in Kenya

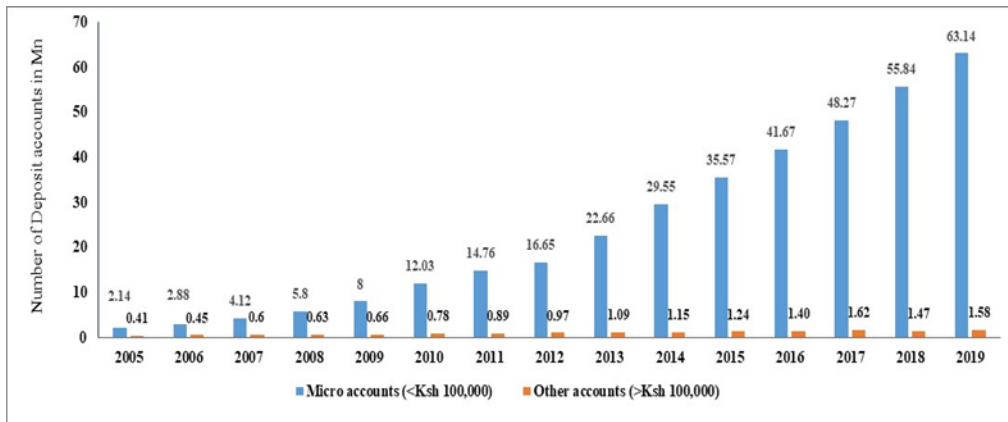


Source: Central Bank of Kenya

Figure 5.8 shows the growth of deposit accounts in the same period, 2005-2019. Deposit accounts have increased from 2.55 million in 2005 to 64.7 million in 2019 with over 95% of these deposit accounts being micro accounts, and currently 94% are micro savings accounts. The number of micro accounts has increased more than twenty five-fold from about 2.1 million accounts in 2005 to 63.1 million accounts in 2019. This growth is attributable to reduced costs of maintaining micro accounts and introduction of innovative instruments targeting lower tier market segments – using the M-Pesa platform to open savings accounts such as M-Shwari, KCB-Pesa and other DFS products.

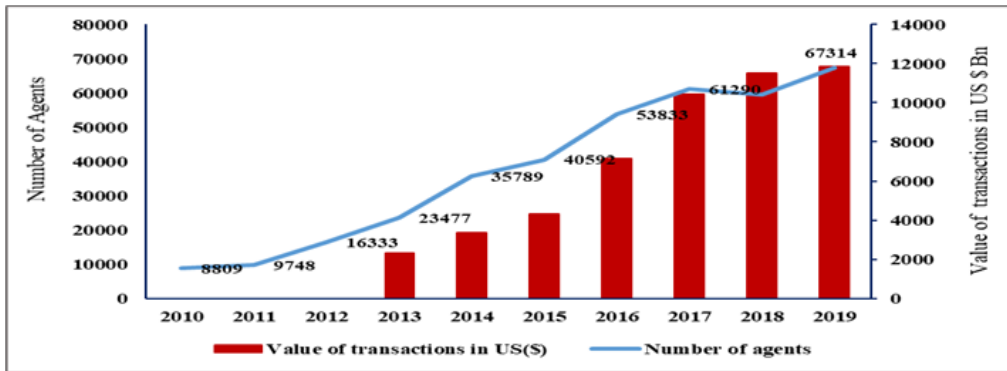
Looking closely at the growth of micro-accounts, the acceleration seems to start in 2007 from 4.12 million accounts to double to 8 million accounts in 2009. The progression from then on is driven by the dynamics in the market; it is also the period that M-Pesa was registering 10,000 accounts every day. By 2010, one of the complementary additions to the branch network was the successful launch of Agency banking. Two banks started to appoint Agents in 2010 and so far 16 banks have appointed over 3,500 Agents (Figure 5.9). The pattern of branch networks, the success of the agency model and the success of M-Pesa all seem to corroborate the pattern of deposit accounts and the vibrancy of the banking sector in Kenya over this period.

Figure 5.8: Growth in bank deposit accounts in Kenya, 2005-2019



Source: Central Bank of Kenya

The number of institutions with bank Agent networks rose from 2 in 2010 to 16 in 2014 and the number of commercial bank Agents has increased to more than 35,000 since the launch of the agency banking initiative in May 2010. As at 2019, the number of Agents had increased to 67,314. In addition, the value of transactions handled by Agents had risen from US\$ 469 million in 2011 to more than US\$ 3.7 billion in 2014 and close to US\$ 12 billion in 2019. This growth is attributable to penetration of bank Agents in underserved areas, and the increase in financial access touch points.

Figure 5.9: Agency banking uptake in Kenya, 2010-2019

Source: Central Bank of Kenya

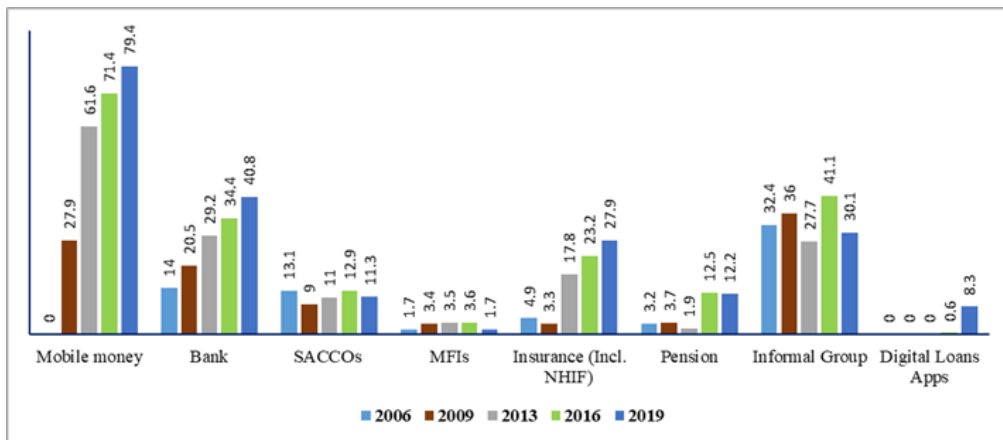
Other avenues and reform measures by the Central Bank have also complimented the DFS to raise the financial inclusion profile for Kenya in the period. They include:

- First, licensing of Deposit-Taking Microfinance (DTM) institutions both nationwide and community micro finance institutions that later changed their name to Micro-Finance Banks (MFBs). They provide financial services at a closer reach to low income segments. The outreach introduction of Agency Banking model later helped the MFBs by easing branch requirements/specifications.
- Second, the commercial banks were encouraged to expand the branch network/outlets. This increased commercial banks' branches from 534 in 2005 to 1,113 by end of August 2011 to 1,490 in 2019. Growth has been driven mainly by competition and declining barriers to entry.
- Third, Agency Banking – Turning non-bank outlets into financial services providers. So far, 67,314 approved bank Agents facilitating 3.9 million transactions valued at Ksh 1.2 trillion (US\$ 12 billion), leveraging on mobile phone Agents also. These Agents have pushed forward financial inclusion frontiers as main access touch points for financial services and serve several banks (as there are no exclusivity clauses).
- Fourth, increasing the core capital of banks to enhance strong banks that raises the level of confidence in the market and becomes a safe haven for savings. The enhancement of core capital for commercial banks to a new level of Ksh 1 billion (US\$ 10 million) from the level of Ksh 250 million (US\$ 2.5 million).
- Fifth, reducing cost of doing business - Currency Centres - Reducing cash in transit costs for banks and their branch networks across regions.

- Finally, consumer protection - the missing link in financial inclusion. Consumer protection rights were entrenched in Kenya’s new Constitution. The new Constitution gave a legal framework to develop strong institutions to grow the market.

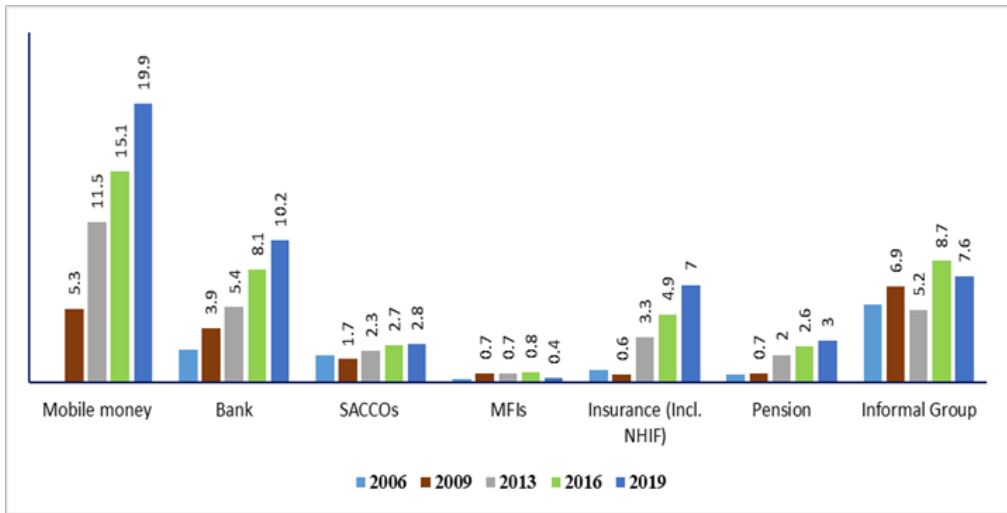
The effects of M-Pesa, linked bank accounts (to M-Pesa) and agency banking go further, triggering wider financial inclusion in Kenya. In the 2019 FinAccess survey, 79.4% of the adult population used the mobile phone-based financial services compared to 61.6% in 2013. The highest growth was in the use of digital Apps loans that grew by 8.3% in 2019. The uptake of mobile banking increased from 17.5% in 2016 to 25.3% in 2019 while traditional banking declined from 31.7% to 29.6% over the same period (Figure 4.10).

Figure 5.10: Utilization of financial services across the providers: 2006-2019



Source: FinAccess Survey, 2019

Barriers to entry into the financial system have been significantly reduced, leading to increased usage of financial services across all providers (Figure 5.11). The rise is most notable in the use of banking and insurance services. The proportion of adults with access and use banking services almost tripled from 3.9 million to 10.2 million while those accessing insurance quadrupled from 600,000 to 7 million during the last decade (2009-2019). The number of adults using mobile money increased to 19.9 million in 2019 from 5.3 million in 2009. From figure 5.1, these are registered mobile money accounts - it does appear that Kenyans have more than two mobile accounts. Safaricom allows two accounts per person.

Figure 5.11: Adults using financial services providers (million)

Source: FinAccess Survey, 2019

5.3 Generation 3: Linked credit scores

The third phase that quickly became a natural progression was short term credit applied and disbursed through the same platform. The novelty of this phase was that banks and telcos invested in a more versatile platform that used the transactions and savings data to generate individual credit scores and customize the price of credit, thus emerging as the central platform for digital credit assessment and the distribution of micro-credit (Ndung'u, 2018). This in turn would revolutionize the collateral technology that has acted as a major barrier to borrowing from the financial system by many potential investors; that is the credit market has been hampered by the existing costly collateral technology.

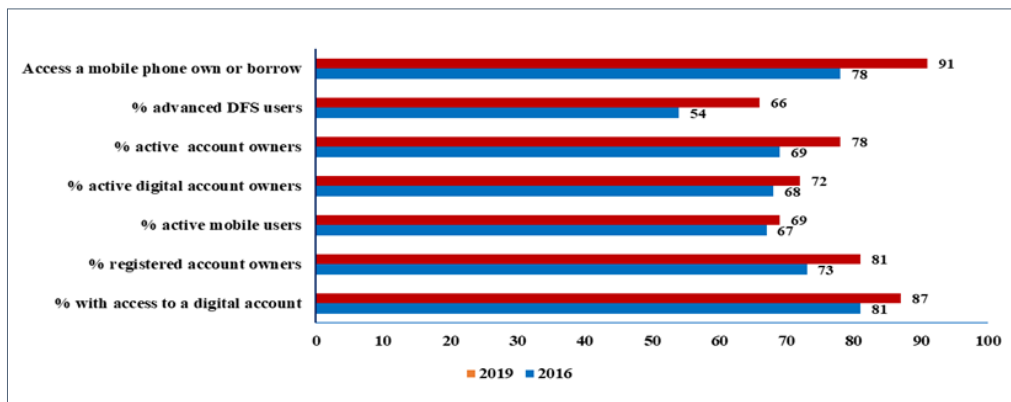
Another key development to use of mobile phone financial services was access of micro-credit anytime anywhere within network reach. At 3:00 a.m one could borrow, trade in micro business (selling vegetables in Wakulima market) and by 7:00 a.m, repaid the loan and earned a profit. Access to credit was no longer confined to a building structure-bank that was time consuming with no immediate results. This access of credit by small savers and borrowes was key in enhancing operations of small businesses in Kenya, which contribute 28.4%⁹ to the gross domestic product. Technology thus made it possible to access credit anywhere and anytime, which enhanced economic activity.

9 Kenya National Bureau of Statistics, Kenya-Small and Medium Enterprises (MSME) Survey 2016

The development led to commercial banks partnering with other mobile money transfer and mobile money commerce operators to offer credit. Besides the pioneer Safaricom’s M-Pesa platform, we have KCB-M-Pesa, M-Coop by Cooperative bank, Timiza by Absa bank, M-Shwari by CBA, Airtel (Airtel Money), Telkom (T-Kash), and Mobile Pay Ltd (Tangaza). Equity bank also developed its own M-money system – Equitel. Moreover, increase in demand for credit and high preferences for technology (mobile phones) has led to proliferation of other digital lenders in the Kenyan financial market. As at December 2018, there were 23 digital credit providers that were unregulated by the Central Bank.

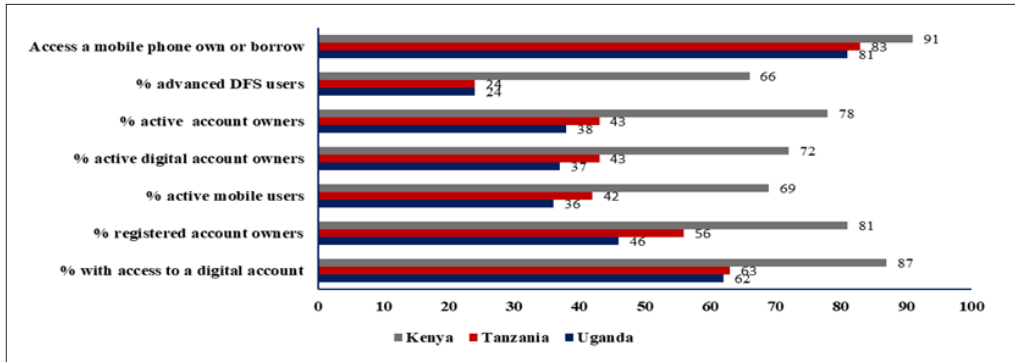
Two pieces of evidence from FinAccess 2019 and the CBK reinforce on the point of preference to use MFS rather than banks as a source of credit. Figures 5.12 and 5.13 show an uptake of digital accounts ownership and registration that increased significantly in 2019 compared to 2016, reflecting high adoption of digital accounts. Those with access to a mobile phone, own or borrowed, increased to 91% in 2019 compared to 78% in 2016.

Figure 5.12: Active digital accounts in Kenya 2016 versus 2019



Source: FinAccess Survey, 2019

Figure 5.13 shows that compared to Uganda and Tanzania, Kenya is ahead on digital account usage for savings, borrowing and transacitons purposes.

Figure 5.13: Active digital accounts, country comparison

Source: FinAccess Survey, 2019

The lending to Micro Small and Medium Enterprises as a percentage of total banking industry loans has declined over the years from 23.4% in 2013 to 15.8% in 2018, implying the preference of MSMEs to borrow digitally from other credit providers as opposed to borrowing from the banks. However, in value terms, the amounts have increased to Ksh 393.0 billion in 2018 from Ksh 332.0 billion in 2013.

Table 5.5: MSMEs lending compared to total banking sector loan portfolio (Ksh billion)

As at December	MSMEs Loan Portfolio, KSh.Bn	Total Banking Sector Loan Portfolio, KSh. Bn	MSMEs Loans/Total Loan Portfolio%
2018	393	2,487.34	15.8
2017	413.9	2,155.73	19.2
2013	332	1,418.80	23.4
2011	225	1,076.56	20.9
2009	133	682.05	19.5

Source: Central Bank of Kenya

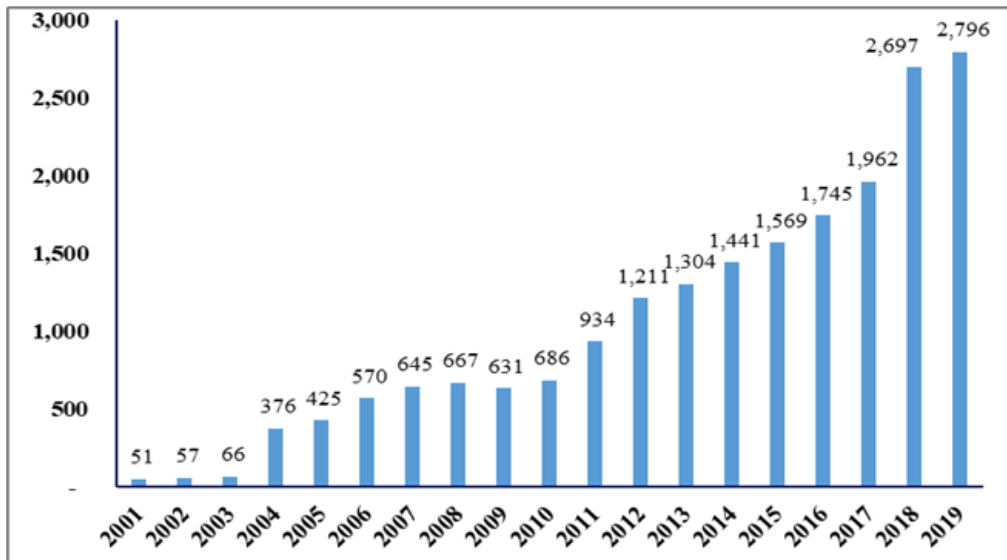
5.4 Generation 4: International remittances

The fourth challenge in the expansion of the M-Pesa technological platform was to enable cross-border payments and international remittances. The immediate result of this development would be the transformation of Kenya's informal Hawala money transfer system to a formal money remittance system. Demand for regulations to cope with these innovations and the more intensive use of technology to monitor the money-transfer market have improved the AML/CFT regime. However, the expansion of commercial bank branch networks, mobile network operations and mobile money

platforms across other countries in Africa and the world to enable cross-border and international remittances pose an increasing challenge for regulators. Mwega (2014) points out that financial integration implies that the negative externality costs associated with bank failure go beyond national borders, a reality that is not taken into account by national regulators and supervisors. Furthermore, the emergence of virtual currencies, such as Bitcoin, pose a challenge to the central banks charged with monitoring and supervising international transactions whose demand and supply mechanisms are not yet clear.

Kenya’s cross border remittance transactions have been revolutionized through the use of technology in mobile money transfer products. The adoption of technology through use of M-Pesa has enhanced the flow of international remittances at lower prices, facilitating money transfer to millions of low income and unbanked populations in the rural areas in Kenya. Figure 4.14 shows that in Kenya, remittances have steadily increased at an average annual rate of 14.3% in the last decade, rising from US\$ 570 million in 2006 to US\$ 2.8 billion in 2019, constituting 2.9% of GDP. The steady increase from 2008 to 2019 is attributed to adoption of technology (mobile money) and platforms–World Remit and TransferWise (by Equity Bank) that improved efficiency and lowered the cost of transfer of money across borders.

Figure 5.14: Migrant remittance inflows (US\$ millions)



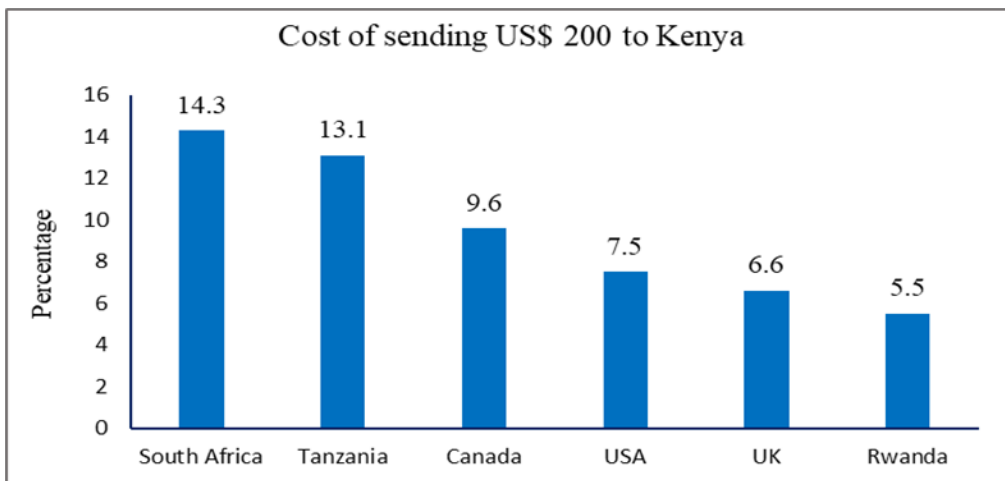
Source: World Bank Migration and Remittances data, Central Bank of Kenya

Evidently, the presence of mobile money platforms has increased remittances inflows in Kenya. The growth and levels of remittances inflows in Kenya has surpassed the levels of foreign direct investment and portfolio equity flows. Yet, I am wary of the fact that the statistics reflected in Figure 5.14 are the flows through formal channels,

which I believe grossly understate migrant remittances since most migrants use the informal channels to send money, which is unrecorded. Kenya is one of the top eight highest remittance-recipient countries in Africa after Nigeria, Egypt, Morocco, Tunisia, Ghana, Algeria and Senegal. The international remittances flows have increased financial depth and inclusion in Kenya.

However, there is need for development of regulation that would see reduction in cost of sending money within African countries. Apparently, it is cheaper to send money from countries out of Africa into Kenya. For example, the cost of sending US\$ 200 from South Africa and Tanzania to Kenya is 14.3% and 13.1%, respectively, while sending the same amounts cost 6.6% from the United Kingdom. Huge variations also exist across corridors as indicated by the cost of sending similar amounts of money from Rwanda recorded at 5.5%, yet the neighbouring Tanzania sends the same amount of money at double the cost (see Figure 5.15). Among the solutions to driving this cost down is use of modern and cheaper technology to send money, adoption of cross cutting regulation for countries in Africa, and also development of more payout stations in the rural areas or where there is none.

Figure 5.15: Cost of sending money to Kenya by corridor



Source: *Remittance Price Worldwide and Send Money Africa*

5.5 Generation 5: Partnerships with Fintech Firms

The uptake of FinTechs in the financial industry has been enhanced by increased uptake in the use of mobile networks and mobile embedded systems, the use of big data and data analytics, and cloud computing, and crowd funding (Gai et al., 2018). FinTechs may be concentrated on some aspects of the industry such as the mobile sites for internet banking, or replace an established mode of delivery of services, for example, independent online banks, mobile financial services like in the case

of Kenya. The fintech activities have permeated the whole of the financial industry that includes loan technology, payments, international transfers, personal finance and asset management, blockchain, the capital markets, equity crowdfunding and security technology.

One question to ask is whether M-Pesa is a fintech product? I argue it is. FinTechs perform three essential roles in the financial industry. These are: reduction of transaction costs and enhancing efficiency; improve business and risk management; and financial inclusion, which I have already demonstrated (see earlier chapters including this one) using the M-Pesa Kenyan example.

- FinTechs reduce the cost of data collection and processing that makes it possible to process huge volumes of transactions within seconds.
- FinTechs use available data/information to manage risks resulting in improvement in businesses.
- The use of internet and mobile technology allows easier and cheaper access to finance as a result of reduced costs of data collection and monitoring that lead to improved efficiency that make access to finance more inclusive.

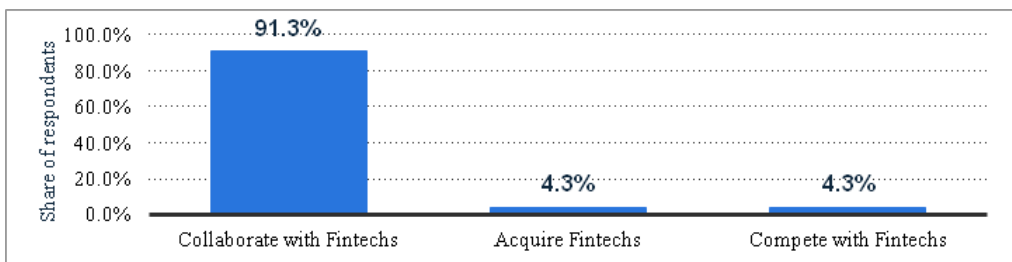
M-Pesa as a FinTech product has become a platform of financial services and products used to achieve fruitful ends. It has worked as a retail electronic transactions platform from DFS to digitization and has allowed Fintechs to roll out sustainable business models. These business models cut across all the sectors of the economy. Some examples in Kenya include:

- (i) One Acre Fund – Raised productivity and incomes for smallholder farmers.
- (ii) M-Kopa on domestic solar energy supply.
- (iii) Water vending machines for urban slums for poor households.
- (iv) Crop insurance models, virtual health insurance products (M-Tiba on financing health services).
- (v) JUMO, a non-bank credit-only lender, now partners with a range of mobile money firms in Kenya

In Kenya, mobile money facilitates related innovations in Kenya's payment system, particularly the Government's e-citizen initiative.¹⁰ The Kenya Government delivers a wide range of services, including birth certificates, driver's licenses and passports, electronically and collects payments of fines and penalties. The Kenya Revenue Authority has designed tax payments platforms based on retail electronic payments platform. Card payments are accepted, but mobile money payments comprise an estimated 99% of the volume of e-citizen transactions.¹¹ Mobile money also facilitates activities in Kenya's capital market. For example, Safaricom has offered shareholders the option of receiving dividend payments through M-Pesa. Since March 2019, the Kenyan Government has offered M-Akiba bonds. This is a retail offering sold in minimum amounts of Ksh 3,000 (US\$ 30) via the Safaricom and Airtel Mobile Network Operators (MNOs) networks.¹² It provides an interest rate of 10% with no taxes, providing small services with returns far higher than bank savings products.¹³

Further, FinTechs have also laid their strong foundation in the market, which has caused banks to compete aggressively for mobile banking customers. The rapid uptake of mobile phones has also fuelled the uptake of FinTechs. A survey carried out on banks worldwide in 2017 by Statista asking them whether FinTechs posed challenges or opportunities for the sector showed that a majority believed that fintechs offered more opportunities than challenges. Over 90% of the bank executives responded that they (banks) were willing to collaborate with FinTechs; 4% said they will acquire them and another 4% indicated that they will compete with them.

Figure 5.16: Future strategies of banks regarding fintech companies worldwide 2017



Source: Statista

10 Kenyan Government <<https://www.ecitizen.go.ke/ecitizen-services.html>>.

11 GSMA<<https://www.gsma.com/mobilefordevelopment/programme/mobile-money/kenya-went-digitising-person-government-p2g-payments/>>.

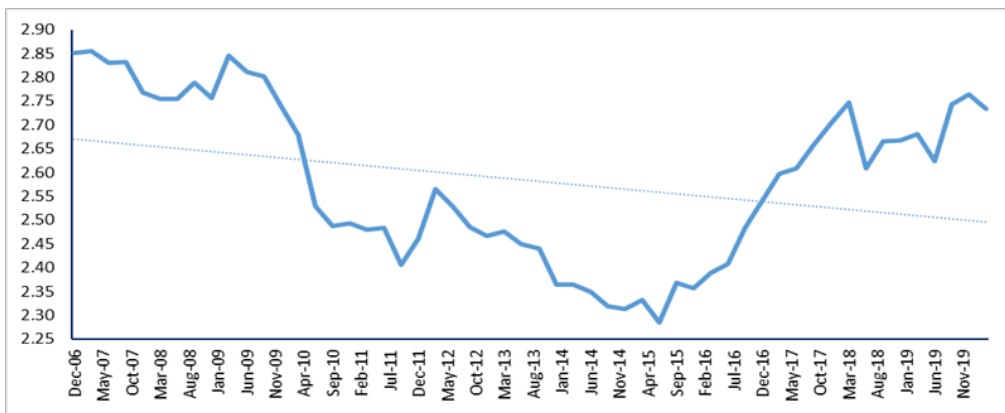
12 Kenyan Government, Central Depository and Settlement Corporation, Nairobi Securities Exchange <<http://www.m-akiba.go.ke/M-Akiba-English-Prospectus.pdf>>.

13 Kenyan Government, Central Depository and Settlement Corporation, Nairobi Securities Exchange <<http://www.m-akiba.go.ke/M-Akiba-English-Prospectus.pdf>>.

5.6 Generation 6: M-Pesa impact on monetary policy and beyond

The benefit of the financial innovation go further than financial inclusion, leading even to a better environment for monetary policy. Figure 5.17 shows declining velocity starting in 2007 but a significant decline from 2009. Figure 5.18 supplements this information by showing the behaviour of money multiplier in this period. The declining velocity and the unstable money multiplier would imply that the money demand is unstable in this period, and this had implications for the monetary policy framework.

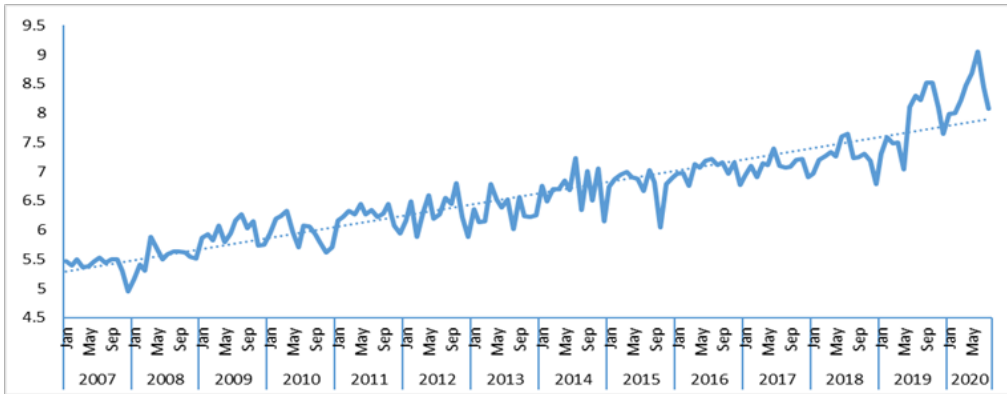
Figure 5.17: Velocity of money



Source: Central Bank of Kenya

The evolution of the velocity of money depicts different regimes – financial development and less cash changing hands. In addition, the rising money multiplier may imply that the CBK may have lost control of money supply process, but actually reflects financial innovation in the market. Consequently, targeting broad money via reserve money as an intermediate target was inadequate and perhaps obsolete. The monetary policy framework had to change in 2009 and CBK adopted Net Domestic Assets in place of Reserve Money. In the more recent past, monetary policy framework has been price-based.

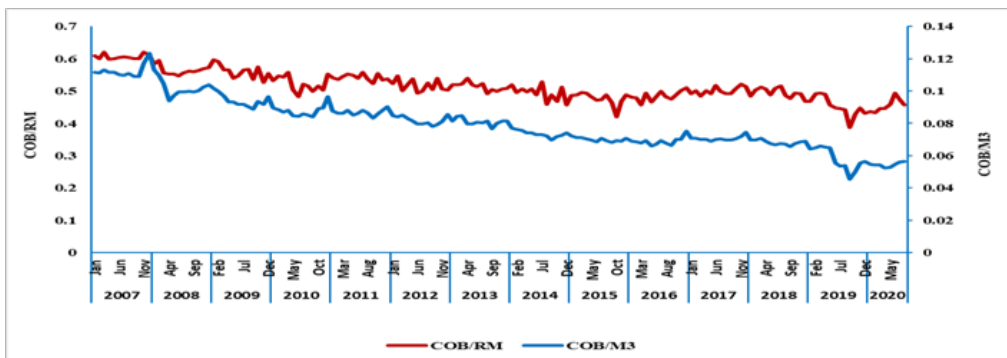
Figure 5.18: Money Multiplier (M3/RM)



Source: Central Bank of Kenya

In addition, we may conjecture that the declining velocity of circulation of money and significant decline of the proportion of currency outside banks may be reflecting financial deepening and increased financial innovation from 2009 to date. The declining currency outside banks and the significant velocity decline reflects changes in behaviour of holding cash; people are keeping less and less money outside of banks and preferring less cash in their daily transactions (Figure 5.19). The traditional monetary policy interventions impact through well established and stable channels where it is assumed that velocity and money multiplier were stable and predictable in Kenya was thus violated.

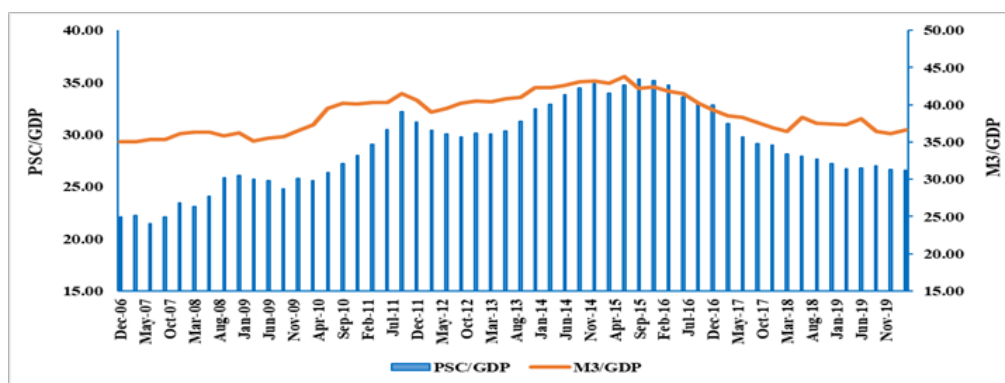
Figure 5.19: Decline in cash outside bank in relation to broad and reserve money



Source: Central Bank of Kenya

Kenya’s financial depth has been rising with increasing financial inclusion as shown by a rise in the ratio of broad money (M3) to gross domestic product in Figure 5.20. It rose to 37% in March 2020 from 35% in March 2007, peaking at 44% in June 2015. The growth of private sector credit (PSC) has followed a similar pattern as the growth in broad money, increasing from 22.3% in March 2007 to 26.6% in March 2020, and peaking at 35% in September 2015.

Figure 5.20: Increase in financial depth in Kenya (%)



Source: Central Bank of Kenya

To position these results on financial inclusion and supporting policy reforms that have supported market developments, we have provided a background of Kenya’s banking sector in the period 2007 to 2019. We have shown that Kenya’s financial sector has undergone significant transformation driven by the DFS evolution. The DFS has coordinated all market segments and in the last decade or so, we have witnessed:

- Significant decline of barriers to entry to the financial sector via removal of minimum balances.
- Significant decline in cost of maintaining micro accounts - via ledger fees, etc.
- The introduction of new instruments and financial products targeting lower segments of the population.

However, physical distances remain an obstacle; that is, where digital finance is required. A trip to the bank is very expensive and most trips are not necessary to deposit or withdraw but to perform some transactions or even to enquire on the balances of their accounts. The poor in particular are transactions heavy, therefore the uptake and use of mobile financial services was the best solution.

The financial inclusion picture that has emerged is consistent with the fact that DFS revolution has allowed accelerating financial inclusion in Kenya where new financial

services and products have emerged, encouraged by innovation and sound regulation. New delivery channels have been developed and these channels are effective, transparent and efficient, and that payments system has emerged that has reached the poor and the wealthy in the same speed. These services and products transcend all market segments and, as shown from the FinAccess data, the use of mobile phone-based financial services accelerated from 27.9% in 2009 to 61.6% in 2013 and from 71.4% in 2016 to 79.4% of the adult population in 2019. Other financial services seem to have been complemented by the mobile financial services:

- The proportion of the adult population using banks has increased to 40.8% in 2019 compared to 29.2% in 2013 and 14.0% in 2006 before the mobile phone financial services were introduced in Kenya.
- Insurance is serving 27.9% of the adult population using the 2019 survey compared to 4.9% in 2006.
- The savings products in the banking sector (M-Shwari and KCB-Pesa) have attracted 18% of the adult population – this is virtual banking service. The survey results show that more Kenyans are now using mobile financial services and mobile banking on a daily basis.
- Bank deposit accounts have increased from slightly over 4 million accounts in 2007 to over 55 million accounts in 2018.
- Financial access touch points have been expanding. Kenya is ahead of its peers in financial inclusion as of the 2014 survey: (i) 76.7% of the population are within 5km of financial access points compared with 35.1% in Tanzania, 42.7% in Uganda and 47.3% in Nigeria; (ii) Financial access points per 100,000 people stands at 161.9 in Kenya compared with 48.9 in Tanzania, 63.1 in Uganda and 11.4 in Nigeria.

The conclusion from these outcomes is that M-Pesa has enabled a turnaround in Kenya on financial inclusion; it has also been able to catalyse the entire payments system development and has allowed communication/coordination across market segments and informal markets.

It may be appropriate now to scheme with clarity and to produce some data points to show the impact after more than a decade of M-Pesa. The following conclusions can be supported by data about M-Pesa:

1. A financial inclusion platform has been developed and is likely to be more dynamic in future but it has also created an endogenous demand for a national strategy on financial inclusion to be developed, and that strategy has cut across the totality of the financial sector.

2. There have been significant reductions in transactions costs in the economy; a new revolution in the payments and settlement platform that is efficient, effective and in real time has been developed.
3. The M-Pesa revolution and hence the DFS has created an internal demand for completing the financial infrastructure. This involves developing institutions that support and protect the financial market. Such institutions have included those that provide information, such as credit reference bureaus that will in future use this information capital to change the collateral technology in the country. In addition, this has allowed space for deposit insurance mechanisms and finally the Financial Reporting Centre to improve the AML/CFT regime. In addition, new legislation that includes competition policy, consumer protection and financial literacy have been considered.
4. The Kenyan commercial banks (not necessarily big banks) have used the DFS as a cost effective platform to manage micro savings/deposits accounts and microcredit supply and also to roll out products consistent with their market niches. This DFS platform has enabled commercial banks to manage micro accounts and, therefore, huge amounts of deposits from micro savers has given these banks the capacity for intermediation in the market and to expand their reach.
5. An efficient AML/CFT regime that is easy to monitor has reduced the role of informal markets and recognized that financial exclusion is bad for AML/CFT regime.
6. An environment for monetary policy to work and a landscape to change monetary policy framework now exists. In Kenya, as soon as M-Pesa success started to be noticed in 2008, monetary aggregate targeting framework was considered obsolete, the demand for money shifted, innovations in the financial market increased the money multiplier, and the changing preference for holding cash to cashless induced a drastic decline of velocity of money.
7. The political economy cannot be forgotten; the DFS has generated massive economic rents and being distributed through this platform – at present about 4.5% of Kenya’s annualised GDP is transacted daily – that is Ksh 7.5 billion or US\$ 75 million per day.

6

LESSONS, CHALLENGES AND THE FUTURE FOR DIGITIZATION

We have shown how frontier developments and endogenous innovations shaped the Kenyan market through a unique “test and learn” process adopted by regulators. What started as a bank and telco product (M-Pesa) on a simple money transfer technological platform has pushed innovation and the regulatory space towards important digitization developments. Digital development in Kenya has contributed towards strengthening state capacity in important ways. At the same time, these impressive achievements have also raised concerns about the need to further strengthen state capacity to cope with regulatory challenges, provide market safeguards, and evolve a national identification system that is suitable for the next phase of an increasingly digital society. This section highlights the main lessons learnt from Kenya’s experience through the use of M-Pesa and the challenges facing the future digital environment.

6.1 Lessons drawn from Kenya

First, digitization has pushed the retail electronic payments system to cover virtually the whole economy, including government services, pushing the government to embrace an electronic payments ecosystem. One spillover effect has been the formalization of most informal transactions, raising hopes that informal markets in Kenya, and indeed Africa, will one day shift towards formality. M-Pesa-type or mobile money or digital-based products have led to a vibrancy of financial markets cutting across all sectors and improved transactions at all levels from the formal to informal markets in Kenya and the East African region.

Second, Kenya has demonstrated that digitization can enable financial inclusion. The retail electronic payments system ignited by M-Pesa, commonly labelled mobile money, has worked as a transactions platform bringing the unbanked into the banking system. The platform supported the evolution of national retail payments; positioned banks as a platform to manage micro accounts through virtual savings products; and enabled the evolution of virtual credit markets, micro insurance, and investments in government securities. It has also been useful in tracking fraudulent flows into personal accounts.

Third, digitization has enabled fintechs to develop innovative business models with payments solutions or platforms sitting in commercial banks. Products such as M-Akiba for micro investors in government securities, M-Kopa for solar energy supply, One Acre Fund in agriculture, and many other products are making a difference outside the financial sector. Once digitization has taken root in an economy, it allows for sustainable business models to be developed and launched on the digital platform to support other sectors of the economy.

Finally, digitization is now driving fiscal policy designs, revenue administration, and public finance management. It is reducing leakages in revenue administration, but more importantly the digital tax payment platform is an important innovation for efficiency and transparency. Indeed, digital platforms have revolutionized the way payments to and from the government are made. In addition, government services are being digitized across ministries and government agencies.

6.2 Lessons from use of M-Pesa as a tool for financial inclusion

1. *Endogenous demand for regulatory reforms, regulatory capacity and regulatory technology and, in addition, endogenous demand to complete the financial infrastructure:* Information capital (credit reference bureaus; deposit insurance; competition policy; consumer protection/financial literacy, etc) are the institutions that support the market and protect the markets. The Central Bank of Kenya with the support of the Kenya Bankers Association and financial support from FSD(K) was able to set up a credit information sharing project that gave rise to Credit Reference Bureaus (CRBs) that are supervised by the Central Bank. Banks and individual customers can access information from the CRBs and can also cross reference their customers with CRB information. Banks, microfinance institutions, insurances, pension funds and utility companies provide information to CRBs. The Central Bank considered this as a development of information capital that would support market growth and deepening through confidence that information on market participants was available. Also, transactions and savings data can be used to generate credit scores for use as the basis to evaluate and price micro credit. The celebrated M-Shwari type of products (also KCB Pesa, and M-Pawa in Tanzania) have been the natural development from the virtual banking system. The ability to change the collateral technology that has been a major barrier to affordable credit and financial sector growth in many African countries opens avenues for further financial inclusion and household investments. The second intervention was the need to enhance the capacity and the capability of the Deposit Protection Fund (now Kenya Deposit Insurance Corporation - KDIC). The deposit insurance covers up to Ksh 100,000 (US\$ 1,100) and covers over 90% of total accounts in the financial sector. This has become important in efforts to to promote correspondent banking, cross-border payments, international remittances and Kenya's regional banking

expansion. Regulatory reforms and regulatory capacity has encouraged further innovation for mass financial inclusion in Kenya. Finally, financial inclusion has supported a better AML/CFT regime.

2. *Banks' heavy investments on the technological platform:* Financial inclusion has allowed banks to develop capacity to grow and to serve their market niches – strong banks can weather shocks and roll out competitive products for their market niches.
3. *Strong banks have emerged – branch outlets, bank deposits and loans accounts have increased.* Kenya banks cover the EAC region, thus widening the market. Between 2007 and 2019, branch networks of Kenyan banks expanded from about 575 to 1,490 branches. The rural branches have expanded faster from about 170 in 2007 to 660 in 2016 and microfinances have also equally increased. In addition, Kenyan banks have expanded to the Eastern Africa region, with over 310 branch outlets. The customer base has also increased. Deposit accounts have increased from about 4.72 million accounts in 2007 to over 55 million accounts in 2018. This has provided banks with a large deposit base and capacity for growth.
4. *Payments technology has now developed; it is efficient, transparent and effective – has covered other markets/sectors – insurance, capital markets, social protection.* There are different actors at different market segments: microfinance, SACCOs and Agency banking. M-Pesa has been useful in other financial markets such as insurance, capital markets and pensions and government's social protection programme.
5. *Governments targeted intervention on social protection programmes.* An efficient and effective payments platform has been useful for government's targeted social protection for poor households and physically disadvantaged persons for financial transfers.
6. *M-Pesa has led to a vibrancy of the financial market cutting across all sub-sectors and improved transactions at all levels including the informal sector.* M-Pesa has been an important tool for revolutionizing the payments system in the country; it has been a catalyst and a driver for financial inclusion in Kenya.
7. *M-Pesa has improved the environment for monetary policy: Financial inclusion and financial market development have improved the monetary policy environment.* Declining velocity – is an indication of financial depth and rising multiplier - an indication of financial innovation. Currency outside the banking sector as a ratio of broad money has declined, which is a signal for less money being held in “unsafe” places. These outcomes then portend a challenge to the current monetary policy framework. Velocity movements may imply unstable money

demand. The relationship between reserve money and broad money is unstable and unpredictable, therefore moving from monetary targeting to price-based monetary policy framework.

6.3 Replication of regulation and other approaches

This regulatory approach by Kenya has been replicated elsewhere. For instance, in Tanzania, the regulator made a progressive decision to let regulation follow innovation and support financial inclusion while managing risks. Castri and Gidvani (2014) point out that by engaging closely with MNOs (and their respective partner banks), the Bank of Tanzania (BOT) has been able to offer the private sector a degree of freedom in rolling out new products, responding with sufficient safeguards where necessary. By 2010, Castri and Gidvani (2014) show that the market had reached a certain level of maturity, with four providers and more than 10 million registered mobile money customers, and the BOT had progressively increased its operational knowledge of mobile money and was now in a position to draft regulations that would provide more legal certainty to providers. The BOT also had to ensure that the regulatory arrangements were in compliance with supporting laws and regulations, such as the AML/CFT regime. As the mobile financial services market evolved, continued emphasis on the “test and learn” approach needed a continuous revision to shift to other regulatory approaches such as innovation offices, regulatory sandboxes and RegTech. These are interesting examples that require expounding on briefly:

Innovation offices

Innovation offices are functional units that play a key role in facilitating regulator-innovator engagement. UNSGSA FinTech Working Group and CCAF (2019) point out that innovation offices engage with and provide regulatory clarification to financial services providers that seek to offer innovative products and services. They can improve understanding of technology-enabled financial innovation and support appropriate regulatory responses. They may reduce regulatory uncertainty and signal a pro-innovation stance, which in turn encourages inclusive FinTech. UNSGSA FinTech Working Group and CCAF (2019) note that for innovation offices to be effective, there should be early and close engagement with innovators for executive buy-in and inter-agency coordination.

Regulatory sandboxes

A regulatory sandbox is a regulatory approach typically summarized in writing and published, and which allows live, time-bound testing of innovations under a regulator’s oversight. It consists of a set of rules that allow innovators to test their products/business models in live environment without following some or all legal requirements, subject to predefined restrictions. UNSGSA FinTech Working Group and CCAF (2019) explain that to date, at least two discernible models have emerged:

(i) product testing sandboxes; and (ii) policy testing sandboxes. The lines between the two are not rigid. As pointed out by UNSGSA FinTech Working Group and CCAF (2019), there is emerging evidence of policy testing within product-focused sandboxes particularly in the context of thematic cohorts. Sandboxes can help regulators gain a better understanding of fintech and develop evidence-based regulations that promote inclusive fintech. A regulatory sandbox brings the cost of innovation down, reduces barriers to entry, and allows regulators to collect important insights before deciding if further regulatory action is necessary.

RegTech

RegTech (regulatory technology) is a distinct innovative regulatory initiative. UNSGSA FinTech Working Group and CCAF (2019) point out that RegTech focuses on how to monitor and enforce compliance against relevant regulations, and thus can support a more responsible delivery of innovative financial services, which may directly impact financial inclusion. It also allows regulators to swiftly respond to market developments, better protect consumers, and enhance institutional supervision. UNSGSA FinTech Working Group and CCAF (2019) argue that in the recent past, regulators themselves have begun to consider RegTech as a tool to help keep up with the substantial changes in financial services marketplaces, with RegTech being considered as two distinct but complementary branches; that is, compliance technology (CompTech) and supervisory technology (SupTech).

6.4 The challenges

The digitization of economies comes with many benefits of strengthening government capacity but also raises new demands on capacity for executive regulation to address the challenges. To reap the full range of potential benefits, Kenya will need to ensure a competitive ecosystem and infrastructure that facilitates entry. An enabling regulatory environment and robust consumer protection will also be critical.

1. Securing interoperability of retail electronic payments and transparent pricing

The interoperability¹⁴ of Mobile Network Operators (MNOs) and transparency in the costing of services is still a concern for telecommunication regulators and financial institutions. Kenya's National Payment System Act of 2011 requires payment service providers to use systems capable of becoming interoperable with other payment systems in the country and internationally. However, there are large imbalances in the shares of a mobile market that has almost reached saturation coverage. As of June

¹⁴ Interoperability can broadly be described as the interconnection of mobile money services either between providers or with external parties (Mazer and Rowan, 2016).

2020, the number of mobile subscriptions stood at 57.03 million corresponding to a mobile penetration rate of 119.8%. Safaricom is the dominant MNO in Kenya with a market share of 64.2%, followed by Airtel with a market share of 26.8% and Telkom Kenya (previously Orange Kenya) with a market share of 6.0% and finally Equitel with subscription market share of 3.0%. The fact that Safaricom continues to dominate the market creates a fundamental conflict of interest since all other financial institutions in Kenya remain customers of, and competitors to, one dominant MNO.

The conflict of interest derives from the fact that Safaricom controls access to a large proportion of the mobile network and has an incentive to restrict access to competitors. Mazer and Rowan (2016) point out that the presence of a dominant MNO leaves third-party providers with no other option to reach the majority of the market than to go through this MNO. This implies little incentive for the MNO to drive down the price of unstructured supplementary service data (USSD) technology, which is the dominant front-end technology used in the deployment of mobile banking services in Kenya. The dominant MNO has considerable power to set prices in the market and to control competition by providing or restricting access. Without interoperability, consumer freedom to switch to other networks is limited; accounts are effectively restricted to those on the same MNO network, Agents are not likely to function as Agents for multiple MFS providers, and access to MFS channels by third parties is restricted (Mazer and Rowan, 2016). In a near-saturated market especially, there will be less willingness on the part of Safaricom, as the dominant MNO, to extend interoperability since it may have more to gain by protecting its share of the pie rather than expanding the size of it. Paradoxically, the concentration in market share across mobile financial service providers may also create less demand for interoperability from consumers, since most of their peers will use the same provider.

However, these concerns, real as they are, seem to oversimplify the debate on interoperability in Kenya. It appears that most researchers considering this issue ignore four important elements of the market structure that developed soon after M-Pesa's success.

- First, Safaricom has built a network infrastructure for connectivity that is larger than any other MNO and which it would be very expensive for other MNOs to replicate. A viable solution could be a market arrangement for leasing/renting the installed telcom infrastructure by Safaricom to other MNOs and Mobile Virtual Network Operators (MVNOs) in a given locality based on utilization, as an important avenue for increasing competition and moving interoperability to a higher level.
- Second, the Agent management model has been structured around Safaricom activities. The regulators imposed supervisory responsibility on Safaricom for its Agents, and the resulting master Agents model, described previously, is largely responsible for M-Pesa's success. Even when the Agents' exclusivity clause was removed, other MNOs did not move to engage with the existing Agent network, which

could have created fertile grounds for competition and demands for interoperability. Instead, they have continued with their relatively small number of Agents. The argument here is that interoperability is supposed to increase the market size, lower unit costs and enhance competition and efficiency, leaving market shares to depend on the products and services rolled out by the different MNOs.

- Third, it is much easier for businesses and financial institutions to integrate with M-Pesa as a payments platform. This is in part due to M-Pesa capturing the first-mover advantage, but it also reflects M-Pesa's continued heavy investments in infrastructure, both connectivity and payments platforms, which other MNOs have not been able to replicate. For the debate on interoperability to move to the next level, the market structure in Kenya need to be appreciated. This is why progress probably implies developing arrangements for Safaricom to lease or rent out its existing infrastructure to other MNOs and MVNOs.
- Fourth, Safaricom also leads in another important dimension. It has rolled out a range of complementary products that other MNOs have failed to develop, including support for internet connectivity, home fibre and CCTV security networks, even for use by the government. The lack of product diversity by other MNOs and MVNOs has restricted their coverage and reach. Getting to a competitive market will not be a simple process.

In May 2018, interoperable transactions were formally launched. So far, these cross-network transactions are not in real-time like those of M-Pesa, and their unit cost is much higher. However, these challenges can be overcome if all MNOs invest in real-time transaction platforms, which would reduce the unit costs of transactions.

2. Connectivity across the country

According to the World Bank (2016), there are some 4 billion people worldwide without internet access, about 2 billion who do not use mobile phones, and almost half a billion who live outside areas with a mobile signal. Currently, there are still a number of mobile users in Kenya on 2G technologies, with many more on 3G technologies and 4G technologies. 5G technology is yet to be rolled out. According to Sanni (2017), as of 2016, Kenya's mobile subscribers market penetration was at 54%, its mobile internet subscribers' penetration was at 52%, and its proportion of 3G connections was at 22% while its proportion of 4G connections was only 2%.¹⁵

The GSMA's Mobile Connectivity Index measures individual countries' mobile internet penetration based on four key enablers for mobile internet adoption: *infrastructure*, *affordability*, *consumer readiness*, and *content*. Sanni (2017) argues that to enable

¹⁵ Most of these indicators compare favourably with Sub-Saharan Africa's averages: 43% for mobile subscribers' market penetration, 26% for mobile internet subscriber penetration, 31% for proportion of 3G connections, and 2% for proportion of 4G connections.

greater connectivity, Kenya needs to address a number of these enablers, particularly around network quality, affordability for low-income users, digital skills, and the creation of content in more local languages. If not adequately addressed, the exclusion resulting from these connectivity challenges is likely to further widen the digital divide in Kenya, which is a great concern to the adoption and uptake of e-government services. Power is another constraint; connection to the national electricity grid is limited, especially in rural areas, and there are frequent power blackouts across the country, including for *Huduma* centres.

Recognizing the gap, the Kenyan Government has made efforts to improve connectivity nationwide. As at June 2016, the Government had laid 6,000 km of national fibre optic backbone across all the 47 counties. The installation of internet connectivity equipment has been completed in 29 counties. Installation works were in progress in 12 other counties while five counties were awaiting approval of design. The Government intends to engage private sector players to conclude the installation of the national fibre optic backbone infrastructure. There are also proposals for a project to develop constituency digital innovation hubs to support entrepreneurs, including access to free Wi-Fi in all the 290 constituencies. Improved connectivity across the country would further reduce the cost of doing business, bridge the digital divide, and enhance the roll-out and use of innovative products on digital platforms.

3. Regulatory challenges

Several regulatory challenges have arisen from the use of digital platforms in general and digital financial services in particular. First, preventing cybercrime remains a challenge for Kenyan regulators, especially in terms of capacity for adequate office-level surveillance. A 2016 cybercrime and cybersecurity study by Symantec ranked Kenya as the prime source state in Sub-Saharan Africa as measured by cyber-attack numbers, malware, spam, and phishing hosts (Didenko, 2017). Kenya lacks a comprehensive legal framework for addressing cybercrime. This will be addressed through legislative reforms that are underway following the publication of the Computer and Cybercrimes Bill in June 2017.

The second challenge is the lack of specific crowdfunding regulations in Kenya or in generating new regulations to cope with the innovations and new business designs. A number of regulators have authority to regulate various forms of crowdfunding, including the Central Bank of Kenya, the Capital Markets Authority, and the Communications Authority (Didenko, 2017). A recent study by the Cambridge Centre for Alternative Finance identified several statutes and regulations that might apply to the operation of crowdfunding platforms, depending on their mode of operation. These include the National Payment Systems Act, the Money Remittance Regulations, the Kenya Information and Communications Regulations, the Microfinance Act, the Proceeds of Crime and Anti-Money Laundering Act, the Capital Markets Act, the Banking Act, and the Public Offer Regulations (Didenko, 2017). The Public Fundraising Appeals Bill proposes additional licensing requirements in connection with fundraising systems.

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ANNEX 1

THE 'AUDIT' REPORT ON M-PESA

EXECUTIVE SUMMARY

The objective of this brief is to shed light on:

- How M-Pesa, an innovative money transfer service, has developed in Kenya
- How it is providing services to the unbanked in Kenya both in the urban and rural
- Further how the Central Bank of Kenya continues to play an oversight role to ensure its safety and efficiency, as part of the national payments system role
- Finally, to discuss any risks it poses and how these risks are mitigated

M-Pesa is an electronic money transfer product that enables users to store value on their mobile phone or mobile account in the form of electronic currency that can be used for multiple purposes, including transfers to other users and conversion to and from cash. Electronic money services contribute to the development of mobile commerce and have an overall positive impact on the economy through increased velocity of money (transmission) and swift settlement of transactions. Moreover, the service enables unbanked members of society to access financial services in areas unserved by formal banking services.

The brief distinguishes M-Pesa money transfer service from banking business as provided for under Section 2(1) of the Banking Act. In the M-Pesa model, money is held in a trust account at the Commercial Bank of Africa. Since money in the trust account is not under the control of Safaricom and further cannot be employed for such purposes as lending, investing or in any other manner for the account and at the risk of Safaricom as per Section 2(1) of the Banking Act, M-Pesa is not equivalent to a bank account.

Though technological developments such as ATMs, internet, and mobile phones all have high potential for money transfer services, mobile phones have a higher degree of penetration unlike the ATMs and internet, which have limited coverage due to their dependability on electricity and telephone (fixed) lines.

The trust deed that provides legal protection for the money in the trust account is provided for in the trustee deed. Various legal instruments pertaining to this service including the trustee deed have been presented to the Central Bank and reviewed accordingly. Further to this, funds in the trust account deposited in the Commercial Bank of Africa are regulated by the Central Bank of Kenya under the Banking Act.

Prior to launching the M-Pesa service, Safaricom requested CBK and CCK to authorize the money transfer service. In evaluating this, both institutions had to ensure safety and adequacy of consumer protection. This is still safeguarded as a goal and also to safeguard the credibility of the service.

Legal and regulatory efforts undertaken by both the Central Bank and National Treasury regarding safety, efficiency, and effectiveness of payment systems in the country are highlighted. These include the review of the Central Bank of Kenya Act in the year 2003 to include Section 4A 1(d), the drafting and forwarding to the Attorney General of the National Payments System Bill, and the development of the Oversight Policy Framework document on payments systems in the country. These developments are also benchmarked against International Standards recommended by the Bank for International Settlements (BIS).

M-Pesa is still a low value transfer service and has penetrated all parts of the economy and serves both the banked and unbanked population. But its critical role is to transfer funds. The number of customers using the service has increased from 876,000 in October 2007 to 3.7 million in August 2008. In the same period, transactions have increased from Ksh 2.830 billion in October 2007 to Ksh 16.756 Billion in August 2008. But the average value per transaction has changed marginally from Ksh 2,951 average per transaction in October 2007 to Ksh 2,642 in August 2008 and Ksh 2,916 as the average the whole period the M-Pesa service has been in operation.

1. INTRODCUTION

Kenya is among a number of countries where financial services are starting to be offered by mobile network operators. There is considerable interest in the development of these services since they offer the prospect of providing services to people who presently do not have bank accounts. Branchless banking through retail Agents in Kenya is made possible through the information and communication technologies that customers, retail Agents and mobile network operators use to record and communicate transaction details. A very wide range of outlets are used to offer payment services, which include supermarkets, petrol stations, airtime sellers, courier companies and fertilizer merchants and post offices. Branchless banking through retail Agents may be far more convenient and efficient for poor customers than a bank branch, and this has resulted in extending financial services to the unbanked and marginalized population.

Kenya has experienced quite a significant growth in mobile adoption in the last few years. For example, currently there are 15.2 million mobile phone subscribers compared to 15,000 seven years ago. Results from the DfID-funded FinAccess study (August/September 2006) showed that over half of the adult population in Kenya either own their own phone or have access to one through a friend or family member. In Kenya, while over 55% of the population has access to mobile phones, only 19% of the population is banked. It does follow then that the market is large, that can be tapped by both banks and mobile phones.

The M-Pesa product which was developed by Vodafone and which is operated by their subsidiary and largest Mobile Operator-Safaricom was launched in March 2007 following an initial pilot. This pilot was co-funded by Vodafone and the DfID Financial Deepening Challenge Fund. This brief addresses the issues of M-Pesa and other related services in order to show their workings and related risks, and how these risks are mitigated.

THE M-PESA PRODUCT

Kenyans are using the M-Pesa service to transfer money safely, efficiently and effectively. They use it for paying field staff their allowances and expenses so that they do not need to travel to the Head Offices for payment, sending a long haul truck driver money for spare parts, sending money to family members for consumer purchases, school fees payment, sending pocket money to students in schools, and sending emergency medical payments among other purposes.

A taxi driver wishing to be offered prepaid services due to security reasons could request for payment via M-Pesa service. In many instances today, Kenyans traveling up-country deposit cash before the start of the journey to pick it up upon arrival to their destination thus avoiding the risk of loss through theft or robbery that has increased in Kenyan highways today. The M-Pesa service is therefore not only safe, secure, and fast but meets the needs of many Kenyans thus its popularity across Kenyans of all divide.

M-PESA IS A MONEY TRANSFER SERVICE NOT A BANK ACCOUNT

According to Section 2(1) of the Banking Act, “banking business” means:

- a) the accepting from members of the public of money on deposit repayable on demand or at the expiry of a fixed period or after notice;
- b) the accepting from members of the public of money on current account and payment on and acceptance of cheques; and

- c) the employing of money held on deposit or on current account, or any part of the money, by lending, investment or in any other manner for the account and at the risk of the person so employing the money.

Section 2(1) (c) above, empowers banks to take risk by employing monies received as deposits by lending or investing such monies. This banking business is the one regulated under the Banking Act. It is within this same mandate that banks under instructions by their customers as per Section 2(1) (b) transfer money.

In a national survey on Access to Financial Services in Kenya, it was established that prior to the launch of M-Pesa, local money transfers were effected through various means and include through family/friend (42%), bus or matatu (20%), money transfer services (7%), post office (18%), directly into bank account (8%), cheque (3%), and paid into someone else's account (2%). It is therefore established that money transfer services in Kenya have been inefficient and relatively by unsafe means. Technological developments including ATMs, internet, and mobile phones have a high potential to transfer money more efficiently, effectively, and safely with the respective transaction charges greatly reduced through appropriate use of technology. But while this is the case, both ATMs and internet are electricity- and telephone lines-dependent and are therefore only available in limited areas where electricity and telephone services have been extended. Safaricom's M-Pesa service, however, is mobile phone-dependent and has inherent high penetration capabilities to urban, rural, and remote areas of the country. In view of the foregoing, therefore, the Central Bank of Kenya and other regulatory bodies have a challenge to provide an enabling environment for delivery of these technologically driven innovative money transfer services in order to deepen access to financial services in Kenya.

In M-Pesa, money collected by Agents is deposited in a trust account at the Commercial Bank of Africa. This trust account provides the legal protection for the beneficiaries. The money in this trust account is not under the control of Safaricom and cannot be employed for purposes such as lending, investing or in any other manner for the account and at the risk of Safaricom as per Section 2(1) of the Banking Act. Legal protection of the money in the trust account is provided for in the trustee deed. Various legal instruments pertaining to this service including the trustee deed have been presented to the Central Bank and reviewed accordingly. Further to this, funds in the trust account deposited in the Commercial Bank of Africa are regulated by the Central Bank of Kenya under the Banking Act.

TRUST DEED

“Between M-Pesa holding company (trustee) and M-Pesa participants”

The Trustee holds funds on behalf of all M-Pesa System Participants under a Declaration of Trust (the Trust Deed). Highlights of the Trust Deed are:

- o The Trustee holds all amounts which constitute the Trust Fund on trust for the System Participants.
- o The beneficial entitlement of each System Participant to the Trust Fund at any time shall be to such amount of the Trust Fund in conventional money as is equal to the amount of E-Money in the M-Pesa Account of such System Participant at such time.
- o Safaricom is entitled to levy certain charges on System Participants for the operation of the Service. Where it does so, the M-Pesa Account of the relevant System Participant will be debited by the amount in E-Money of the relevant charge and a M-Pesa Account of Safaricom shall be credited with the relevant amount.
- o The amounts constituting the Trust Fund shall be held by the Trustee in Commercial Bank of Africa.
- o Safaricom undertakes to the Trustee and to the System Participants that it will not issue any new E-Money other than in return for an equal amount in conventional money being paid to and received by the Trustee.
- o Safaricom shall also not effect any transfer of any E-Money from any M-Pesa Account of an amount which exceeds the credit balance of E-Money in the relevant M-Pesa Account.

WHAT RISKS DOES M-PESA FACE? HOW ARE THEY MITIGATED

Risks in M-Pesa money transfer service are similar to those that attach to payments systems worldwide. These include:

- 1.1 **Credit risk** – the risk that a counterparty will not meet an obligation for full value either when due, or at any time thereafter

Mitigation: *This is mitigated by ensuring that Agents prepay before offering services to customers. These Agents operate under an agreement that is enforced by Safaricom.*

1.2 **Liquidity risk** – the risk that a counterparty will not settle an obligation for full value when due, but at some time thereafter

Mitigation: *Safaricom employs stringent vetting criteria which includes entities that are financially sound. As at September 2008, the Agents were distributed as follows; Commercial banks (3.9%), Postal Corporation (2.2%), Supermarkets (1.5%), Petrol stations (1.3%), Shops (24.5%), Airtime sellers (60.7%), SACCOS (3.2%), Courier companies (0.9%), and Chemists (0.9%).*

In the recent past and following discussions with the Central Bank of Kenya, the Agents include commercial banks and ATMs.

1.3 **Operational risk** – the risk that hardware or software problems, or human error, or malicious attack will cause a system to break down or malfunction giving rise to financial exposures and possible losses

Mitigation: *Safaricom is part of the Vodafone group, an international and reputable multinational in the provision of mobile technology. The M-Pesa product benefits from research and development of Vodafone. Operational issues are regulated by the CCK.*

Central Bank of Kenya receives reports on operational issues on a monthly basis. The Bank has emphasized the need for Safaricom to ensure adequate disaster recovery and business continuity arrangements.

1.4 **Settlement risk** – The risk that the flow of funds between transacting parties fails or delays owing to credit, liquidity and operational risk or use of a risky settlement medium which does not coordinate delivery and payment.

Mitigation: *Agents of Safaricom settle through the trust account at the Commercial Bank of Africa and since M-Pesa is a high volume low value retail payment system, settlement in a sound commercial bank is deemed adequate. In authorizing the M-Pesa service, and bearing in mind settlement risks, Central Bank of Kenya placed a maximum limit of Ksh 50,000 per M-Pesa account per day and a transaction limit of Ksh 35,000 per transaction.*

1.5 **Foreign Exchange Settlement Risk (Herstat risk)** – the risk that one party to a foreign exchange transaction does not receive the foreign currency it paid for.

Mitigation: *Safaricom has proposed a foreign remittance service which would require mitigation of this risk. Central Bank of Kenya is reviewing documents supplied by Safaricom. The Bank has also advised Safaricom on the requirement of this service in line with the provisions of the Central Bank of Kenya Act.*

1.6 Legal risk – the risk that unexpected interpretation of the law or legal uncertainty will leave the payment system or members with unforeseen financial exposures and possible losses

Mitigation: *Safaricom as a mobile service provider is licensed and regulated by the CCK and is therefore under the provisions of the Kenya Communications Act 1998. As indicated above, legal relationships with respect to money transfer are provided for in various agreements which are reviewed by the Central Bank. This innovative service is a value added on the licensed mobile services. As a money transfer service, use is made of the existing oversight mandate of the Central Bank of Kenya. This will further be enhanced with enactment of the proposed National Payments System Bill, which has been forwarded to Treasury and the Attorney General.*

Anti-Money Laundering (AML) and Combating Financing of Terrorism (CFT): *From the outset and even before authorization, Safaricom was advised on the requirements of AML/CFT. In this respect, therefore, Safaricom has continued to mitigate this risk through legal instruments, training of Agents, system monitoring for suspicious transactions, and enforcement. In addition, Safaricom observes AML/CFT policy requirements of Vodafone. Just like any other institution, Safaricom awaits the enactment of the AML Bill.*

2. LEGAL AND REGULATORY FRAMEWORK

Oversight of Payments System in Kenya

Following the request by Safaricom to launch this innovative money transfer service in early 2007, the Central Bank of Kenya established a committee which worked closely with payment system experts to facilitate mobile banking in Kenya. A number of critical issues were evaluated, including: the security of the system and other operational aspects, the registration procedures, the systems audit trail, and consumer protection issues. On its part, the Central Bank was more concerned with the need to mitigate various risks that would compromise safety, efficiency, and effectiveness of the payment system.

Oversight of mobile payments is premised on the provisions of the Central Bank of Kenya Act whose mandate was expanded in 2003 to include Section 4A 1(d), which inter alia mandates the Bank to formulate such policies as best promote the establishment, regulation and supervision of efficient and effective payment, clearing and settlement systems. Pursuant to this mandate and in a bid to adequately cater for the modernization of the payments system, the Bank has formulated and proposed the enactment of the National Payments System Act. While the proposed Act will address low value retail payment systems such as M-Pesa, it will also provide for Large Value Payment Systems for inter-bank

payments such as the Kenya Electronic Payments and Settlement System (KEPSS), which is a Systemically Important Payment System (SIPS).

Further to this mandate and in order to operationalize the oversight function, the Bank has developed an Oversight Policy Framework document on payments system in Kenya, which is available at the Bank's website, www.centralbank.go.ke

Prior to the launch of the M-Pesa service and in a meeting held on 16th February 2007 at the Treasury, the following issues were discussed by the Treasury, Ministry of Information and Communications, Central Bank of Kenya, and Safaricom:

- Given that M-Pesa is an innovative e-based money transfer service, Basel Core Principles on payment, clearing and settlement systems and the risk management principles for e-banking will govern its operations;
- The need to clearly define the relationship between Safaricom and Commercial Bank of Africa (CBA), the providers of settlement mechanism for the product;
- The need to clearly define the Agency relationship between Safaricom and M-Pesa Agents;
- The relationship between Safaricom and its primary regulators, CCK, with regard to M-Pesa as a value adding product and tax implications, if any;
- The role of Postal Corporation of Kenya (PCK) as a party interested in establishing agency relationships with Safaricom on the M-Pesa product.

The meeting recommended the following:

- There is need for Safaricom to familiarize itself with the requirements set out in the Basel regulatory instruments;
- Bearing in mind that the Central Bank of Kenya Act has mandated Central Bank to have oversight over payment and settlement systems, Safaricom should initially facilitate CBK's access to information on the M-Pesa product, pending the enactment of specific and comprehensive payment system legislation;
- In the meantime, transparent and clear mandate of the settlement and clearing banks, e.g. CBA, should be upheld;

- The relationship between Safaricom and its primary regulator CCK, with regard to M-Pesa as a value adding product and tax implication, for airtime is maintained on a compliant basis.
- Safaricom should ensure to identify and mitigate risks associated with the product, including settlement risk, infrastructure risk, security risk, and data control risk. As a minimum, adequate audit trail should be maintained.
- The role of PCK as a party interested in establishing agency relationship with Safaricom on the M-Pesa is encouraged due to the wide network of PCK.

Subsequently, the firm was authorized to provide payment services and required to mitigate risks thereto. CBK has continued to oversee the service in line with these recommendations. M-Pesa is not an alternative bank account and it has remained a low value high volume money transfer service as was envisaged since its inception.

The use of the mobile phone platform for delivery of financial services is not limited to M-Pesa. Safaricom is therefore not the only mobile phone money transfer service provider in Kenya as commercial banks are using it to deliver traditional banking products, which include: account inquiry (balance inquiry and mini-statement), funds transfer, bills payment, mobile recharge, and other requests (cheque book and statement request) at fees ranging from Ksh 20 to Ksh 100.

In addition, other mobile companies in Kenya such as Zain, formally Celtel, have been developing money transfer services. Celtel had developed the Sokotele product which Zain is proposing to upgrade to ZAP. Econet has proposed to introduce a similar product with product name Obopay.

CBK has been evaluating these products to ensure that they meet safety and efficiency requirements prior to being launched.

M-Pesa Deposits and Withdrawals

Data on M-Pesa deposits and withdrawals for the period October 2007 to August 2008 is provided in Table A1 while that relating to amounts transferred and their corresponding transactions for the period March 2007 to August 2008 is provided in Table A2 (below). The low average net deposit per customer of Ksh 203 confirms that M-Pesa is a money transfer service while the low average transfer amount per transaction of Ksh 2,916 indicates that M-Pesa is a low value high volume retail payment system.

Table A1: Deposits and withdrawals

	Total Deposits (KSh)	Total Withdrawals (KSh)	Net Deposits (KSh)	No. of Customers	Net Deposit per customer (Ksh)
Oct 07	1,475,563,981	1,353,985,998	121,577,983	875,962	139
Nov 07	1,854,171,597	1,660,781,690	193,389,907	1,133,202	171
Dec 07	2,003,771,945	1,766,498,444	237,273,501	1,345,269	176
Jan 08	2,219,896,512	1,839,143,333	380,753,179	1,589,100	240
Feb 08	2,760,217,824	2,459,572,110	300,645,715	1,821,533	165
Mar 08	3,565,425,759	3,182,026,434	383,399,325	2,075,527	185
Apr 08	4,427,816,102	3,961,822,776	465,993,326	2,373,455	196
May 08	5,777,370,485	5,126,784,590	650,585,895	2,718,127	239
Jun 08	5,768,474,049	5,148,605,901	619,868,148	3,038,523	204
Jul 08	7,425,318,485	6,591,776,408	833,542,077	3,367,192	248
Aug 08	8,872,580,175	7,883,680,776	988,899,399	3,726,175	265
Average net deposit per customer					203

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Table A2: Monthly transactions details

	Total value of transactions (Ksh million)	Total transactions	Average value per transaction (Ksh)
Mar 07	64	21,714	2,965
Apr 07	221	69,740	3,167
May 07	484	149,986	3,225
Jun 07	720	233,661	3,082
Jul 07	1,065	354,298	3,007
Aug 07	1,580	516,239	3,060
Sep 07	2,070	669,689	3,091
Oct 07	2,830	958,908	2,951
Nov 07	3,515	1,221,742	2,877
Dec 07	3,770	1,274,098	2,959
Jan 08	4,059	1,346,827	3,014
Feb 08	5,220	1,739,903	3,000
Mar 08	6,747	2,397,498	2,814
Apr 08	8,390	3,072,888	2,730
May 08	10,904	4,021,265	2,712
Jun 08	10,917	4,201,440	2,598
Jul 08	14,017	5,381,073	2,600
Aug 08	16,756	6,342,413	2,642
Average transfer amount per transactions			2,916

This has worked in several distinct ways that can be summarized as: financial inclusion outcomes; the improvements of AML/CFT especially because DFS has reduced drastically informality of financial market segments; strong banks have evolved in Kenya as a results of improvement in the intermediation process both in quantum and efficiency; collateral process and collateral technology has changed and so has development of information capital an finally the terrain for monetary policy effectiveness has improved.

A Digital Financial Services Revolution in Kenya: The M-Pesa Case Study

This case study aims to contribute to discussion around appropriate regulatory and policy issues of mobile money by focusing on actions that the Central Bank of Kenya took to help M-Pesa grow in a sustainable way. The volume provides a unique, personal perspective of the development of M-Pesa and discusses the need to balance innovation and systemic risk while promoting competition. Competition itself can be a difficult concept when regulating an innovation being launched by a monopoly into a market for financial services containing dominant institutions.

Taken together, the chapters characterize generations of M-Pesa, covering initial growth, bank linkages, digital credit, international remittances and fintech. It further notes the monetary policy impact of M-Pesa in the velocity of money circulation and the money multiplier in the money supply process that pushed the changes in monetary policy framework. These generations demonstrate how the continuing journey of M-Pesa, which has hugely benefited Kenyans, has facilitated rapid growth in financial technology and stimulated digital government and digital transformation.

Prof. Njuguna Ndung'u is the Executive Director of the African Economic Research Consortium (AERC) and the immediate past Governor of the Central Bank of Kenya (CBK), where he successfully completed the full two 4-year terms, 2007-2015. His tenure saw the rapid rise of Kenya in the financial inclusion space with global recognition stemming from the pioneering and transformative M-Pesa. He is an Associate Professor of Economics, University of Nairobi, and faculty member of the School of Economics since 1987. He has published widely in international journals as well as chapters in various books on economic policy issues. Prof Njuguna Ndung'u has also been a member of the Advisory Committee of the Alliance for Financial Inclusion (AFI) and was its Chair in its formative years in 2009-2012.

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