

NO KENYAN LEFT BEHIND: THE MODEL OF FINANCIAL INCLUSION THROUGH MOBILE BANKING

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ABSTRACT

The importance of widespread access to suitable financial services for the populace in fostering economic vitality is well recognized. Regrettably, much of the developing world experiences a relative scarcity of crucial financial services in rural and semi-urban areas. With estimated mobile device ownership at over 700 million in Africa, innovative banking solutions such as mobile banking offer potential channels to advance the access frontier in the banking industry. This study examines Kenya's highly successful money transfer model, M-pesa, in an effort to explore the nature and role of financial inclusiveness in stimulating economic activity. M-pesa allows ordinary Kenyans to send money across the country cheaply and reliably using mobile devices. As such, the stage appears set for a mass adoption by similarly situated countries in the region that are keen to enhance their financial services. Understanding the nature and role of economic dynamism dispensed through financial inclusiveness can be useful for policy prescription and future studies, among other things. To this end, we borrow from a combination of the ideas of velocity circulation of money and a simple diffusion model to develop a framework for empirical study.

JEL: G00, G20, E41, E42

KEYWORDS: Mobile Banking, Financial Innovation, Financial Inclusion, Money Velocity

INTRODUCTION

In much of the developing world, there is a relative scarcity of crucial financial services in rural and semi-urban areas. Ensuring availability of suitable financial services to as much of the population as possible is a requirement for economic vitality in these regions. The African Development Bank's (AfDB) 2010 estimate of over 500 million people owning mobile phones in Africa appears to favor widespread adoption of Kenya's money transfer model, M-pesa by countries keen to enhance access to financial services. M-pesa is a money transfer service, initially developed and deployed in Kenya by Vodafone, a European telecommunications giant in partnership with Safaricom, the leading Kenyan mobile operator. It allows ordinary Kenyans to send money across the country cheaply and reliably, using their mobile phones. The OECD reports that M-pesa registration estimates at some seven million customers, who are transferring an average of \$2 million a day between themselves. Reports released by the Communications Commission of Kenya in the first quarter of 2012 show that Kenya's mobile penetration is at 77.2 per cent with a market share of 30.4 million mobile subscribers as of September 2012. Given the above indications, a deduction can be made to the effect that new solutions will offer channels to advance the access frontier in the banking industry as more Kenyans are brought into banking solutions.

At this point, a working definition of the meaning of mobile banking is appropriate: Generally, if a bank is not directly involved in the instrumental gratification of a service offered, it is usually called a "mobile payment" (Cruz, Pedro, et al, 2010). Financial services that may be delivered through the mobile channel are not different from those delivered through conventional banking channels in some respects, and can therefore be viewed as a form of branchless banking. Its popularity with customers and retailers alike in both developing and emerging markets is well documented. The case of Kenya, which has caught the attention of other mobile phone operators on the African continent, is of particular interest. Many view it

as the model to be replicated throughout the continent as more countries seek to boost access to financial services among citizens.

This study explores the nature and role of economic dynamism dispensed through branchless banking innovations in Kenya with the aim of shedding more light and developing a useful model framework for empirical investigation among other things. A review of literature follows the introduction. In particular, the literature discusses the subject of branchless banking in the context of suitability of innovations and linkages to economy. A methodology section follows. In it, we conceptualize a model framework for empirical analysis. We conclude with a discussion of future research, potential policy implications in the context of model deployment, and limiting factors of the study.

LITERATURE REVIEW

Examining Suitability of Branchless Banking Innovations

The experience of Kenya with M-pesa can serve to illustrate mobile banking's potential for generating efficiencies in the financial economy. Low cost, money security, speed, and user-friendliness are among such efficiencies. Generally, mobile banking costs to the customer are hardly more than the transaction fee. The usual added charges and other cumbersome details associated with conventional banking scarcely exist, or are absent altogether. Soon after the launching of Kenya's M-pesa, the then Safaricom CEO Michael Joseph was quoted by Business Daily stating: "M-pesa is the first product in the world that allows the unbanked, with no banking details, no registration, no bank account, no credit card, to do banking." We can therefore appreciate how Kenya's M-pesa has steadily gained competitiveness in the money transfer market against customary channels, and is leading to enormous changes in the organization of economic activity, family relations, risk management and mitigation, among other things (Mbiti and Weil, 2011).

For the purposes of this study, the case of Kenya is particularly meaningful because it represents the experience of many underdeveloped regions, particularly those in sub-Saharan Africa where significant sections of the population rely on informal finance solutions, which are often highly inconvenient, invariably unsafe, and largely disconnected from the rest of the world. According to Paul Makin of the OECD, the United Nations Department of Economic and Social Affairs (Undesa) estimates that in Africa alone, there are 300 million (approximately the entire U.S. population) reachable adults with no current access to formal financial services. Ignacio Mass, (2009) asserts that financial markets are quite simply failing to meet the needs of majority of the society in such regions, who are typically poor and live in rural areas. He suggests that any viable mitigating solution must prioritize keeping fixed costs per customer extremely small and reducing unit transaction costs.

In effect, Kenya's experimentation with M-pesa has taken banking transactions out of bank branches and into retail stores in more neighborhoods and villages. The product concept is simple, but nonetheless powerful. Users can transfer money from their mobile phones quickly, safely, and across great distances to other mobile phone users. A bank account is not necessary. Users only need to register with Safaricom for an "M-pesa account." However, recipients need not have an M-pesa account. Ignacio (2009) identified key elements that constitute the platform for branchless banking: (i) a retail network, composed of a collection of retail outlets where transactions are originated, (ii) the payment network, which aggregates the transactions from the collection of retail outlets and routes them to the appropriate issuer, and (iii) the account platform which manages the service logic by authorizing individual transactions and maintaining the value accounts. These elements are all evident in the M-pesa model, and present key tradeoffs that providers need to face. Ignacio (2009) adds that an understanding of the economic drivers helps establish roles of the value chain and types of partnerships that improve the likelihood of achieving the necessary scale, and ensuring that the service can be delivered at an end-to-end transaction cost that is affordable to poor customers.

Evidence suggests that each market evolves slightly differently based on distinct customer needs and other unique considerations, even though service delivery is generally enabled by the core set of elements described above. Yet it is worth noting that branchless banking models follow the same underlying functionality to move funds conveniently for users (Mroueh, 2013). For example, in developing nations such as Kenya, branchless banking is mostly tailored to facilitate person-to-person payments. In more advanced economies, branchless banking is generally richer and largely convenience situated; often includes checking and maintaining account balances or making purchases electronically.

Linking Financial Innovation Solutions to Economic Activity

It can be taken for granted that economic competitiveness and growth are compromised in markets where information is poor, scarce, and inefficiently communicated (Geertz, 1978). Consider the importance of timely access to knowledge of commodity prices. This can be hard to obtain in remote villages with limited telephone connections. The effect is a restricted market access for traders (Lars-Hendrik and Waverman, 2001). Mobile services can effectively relieve such restrictions by replacing physical transportation or specific transactions. In addition, mobile phone technology aids the increased flow of information and can potentially result in efficient commodity prices. Mbiti and Weil (2011) cite studies by Jensen (2007) and Aker (2010) which found that the introduction of mobile phones reduced price dispersion in fish markets in India and grain markets in Niger respectively. Transacting with mobile services can also generate a personal record that can act as a basis for assessing creditworthiness and accessing micro-loans or other financial services that are critical for a widespread vibrant economic activity. Pioneering projects in India, the Philippines, or Kenya that focus on domestic and international remittances have shown the way (Comminos et al. 2008).

Farmers in Kenya continue to enjoy benefits accorded by mobile banking since the adoption of M-pesa. According to a 2011 IRIS Report by Nagarajan and Haas, improvements in food security emerged as one of the four major effects of M-pesa. The connection between food security and economy is understood. Given the unpromising report by USAID (2010) on Kenya's food security situation in which recurrent seasons of failed or poor rains, sustained high food prices, environmental degradation, outbreaks of disease, and flooding are cited as causes, one can readily appreciate the significance of M-pesa's role towards improving food security and the resultant economic implications. Though the link is not straightforward, it nonetheless helps create an environment conducive to vibrant economic activity via aiding time-sensitive farming activities. The effects on Kenya's food security are noticed in improved food production, and in access to, and consumption of diversified foods among the households that receive remittances through M-pesa (USAID 2010).

Other M-pesa effects with a more direct impact on economic activity revolve around money circulation, transaction ease, and security of money (Nagarajan and Haas, 2011). M-pesa account holders can convert cash into "e-money" through a Safaricom dealer, and then follow a simple menu of instructions on their mobile phones to make payments through their accounts. Users can withdraw or deposit funds at anyone of more than 20,000 outlets of a strong agent network. A 2011 Business Today report estimates the network to be 20 times the number of existing bank branches in Kenya. Thus, M-pesa is more than simply a money transfer mode. Its pseudo checking account separates it from many similar products. In a country where an estimated 60 percent of the adult population does not use formal banking services, the implications on the velocity of transactions can be profound. For instance, by some accounts, a quarter of Kenya's GDP is processed on M-pesa. A 2010 AfDB Report linked M-pesa to increases in transactions. The bank believes that the efficiency and near universality of M-pesa has greatly increased the speed with which money moves through the Kenyan economy. The report's findings suggest that M-pesa-induced transactions velocity may have risen by up to four times higher than the transactions velocity of other components of money. In turn, this velocity has affected supply and demand patterns. It can be argued that because Kenyans now have an easier and convenient way to transfer and spend money, more transfers and purchases are occurring.

Together, as a vehicle for financial inclusiveness, the economic dynamisms dispensed by M-pesa are considerable. Given that the volume of money supply and its speed of circulation link money to economic activity (Akinlo, 2012), in the case of Kenya, we can roughly infer that increases in money supply and its speed of circulation in the post M-pesa era are linked to changes economic activity that can be attributed to liquid money settlements. Without doubt, several other factors typically affect money supply and its velocity. Largely, monetary policy is central. For instance, it is known that the velocity of money and interest rates have a positive correlation (Mankiw, 2000). It is also advisable to be mindful that monetary policy and its transmission mechanisms are subject to the influence of external factors such as, currency exchange rate considerations, existing liquidity rules (Mihaljek 2011), prevailing economic conditions, and arrangement of financial institutions among several others. To the extent that innovations in payment methods are one of such factors, we should be alert to the mitigating potential of monetary policy. However, as a starting point, this study confines itself with the assumption that changes in in the rate of transactions occurrences following the adoption of M-pesa largely explain changes in economic activity that can be attributed to settlements with liquid money.

METHODOLOGY

If we assume that the frequency of use of M-pesa stimulates and disperses economic activity, via a velocity mechanism, we can then develop a thought process that can help us investigate the nature and role of vitality dispensed in the economy. To this end, we associate the ideas of the velocity of money concept rooted Fisher’s (1911) in the Quantity Theory of Money, which supposes a direct relationship between price (P) and money supply (M). Under this supposition, increases in the amount of money in circulation result in higher prices for goods and services. The theory builds up on the following simplified definitional relationship, generally referred to as the equation of exchange. (See appendix 1 for additional notes)

$$M \times V = P \times T \tag{1}$$

Where:

M = total amount of money in circulation during a period

V= transactions velocity of money over time

P= price level associated with transactions for the economy during the period

T= index of the real value of aggregate transactions.

Therefore, we can rearrange equation (1) to express transactions velocity of money as follows,

$$V = PT/ M \tag{2}$$

Given that the quantity variable under investigation assume some form of flow process, (for example money circulation and economic dynamism are expressions of some type of flow) we can adopt our thinking to employ a series of scalar quantity equations into which we will incorporate equation (2) as one of the variables.

$$Disp. = (mpesa + \Delta mpesa) \times M \tag{3}$$

Where,

Disp. = measure of diffusion of M-pesa into the economy

mpesa = number of existing registered users of M-pesa

$\Delta mpesa$ = changes in number of M-pesa users over time

M = level of money supply in the economy

If we introduce a composite multiplier ϕ , which we assume estimates the multiplicative effect of changes in number of M-pesa accounts, we can re-write equation (3) as follows,

$$(m - \text{pesa} + \phi t) \times M \tag{4}$$

Where,

t = time, say number of years

We now incorporate equation (2) into the process by taking it for granted that velocity of money describes the level of economic dynamism. We can then postulate the interactions between M-pesa adoptions over time under a given monetary regime, and economic activity using the equation below:

$$V = \int_{t_1}^{t_2} dEconV = \int_0^{t=i} (m - \phi t) M dt \tag{5}$$

Where,

V = estimate of level of economic dynamism

t = period of time

m = number of M-pesa users over time

ϕ = composite multiplier

M = Money supply in the economy

EconV = speed economic activity

CONCLUSION

This study focused on exploring a useful framework that can be used to estimate how financial inclusion in Kenya through mobile banking has affected economic dynamism. The ideas presented are an innovative exploration that blends economic thinking and with aspects of natural science with the aim of developing a framework that can be applied to appropriate data. The study should be viewed as a broadening a conversation that is already taking place among scholars across diverse fields. We envision that using blended thought process in our approach will add richness to our model by combining the complementary features that emerge across natural and social science perspectives.

Discussion of Future Research and Policy Considerations

Following the groundwork laid in this paper, we suggest that future research should focus on testing and identification of potential improvements to the model framework. Using applicable data for Kenya's context, we advise a preliminary deployment of the model presented. We anticipate that preliminary findings will facilitate a more robust framework for a final study. Much of the data that appropriate for the context is mostly available from statistical databases of the Central Bank of Kenya, Communications Commission of Kenya, and the Kenya national Bureau of Statistics.

For policy purposes, it is important to be aware of the diverse contexts in which we can explore the subject of financial inclusion through mobile banking. Some considerations include money laundering (De Koker, 2013 and Olatunde, 2012), consumer behavior (Laukkanen et al, 2007), financial integration (Acharya and Bisin, 2005) and legal issues (Rolf and Darbellay, 2013), to name a few. One aspect that is common in each case is the flexibility demand this new form of technology application requires of policy makers. For example, in the case of M-pesa, with increasing velocity of transactions in Kenya, and the increasing assumption of banking services by mobile service providers, the monetary authorities are back to the drawing board to recalibrate rules on money supply and banking services respectively. In 2008, regulatory authorities in Kenya were tasked to conduct a risk assessment on M-pesa to determine how it fits into the

existing framework (AFI, 2010). That said, we suggest close attention to policy concerns in future studies. We anticipate that empirical findings may reveal expose emerging policy issues that signal for accommodation under existing regimes. We can accept that technology changes are here to stay, along with the attendant cycles of creative disruptions.

Limitations of the Study

A primary limitation of this study is a lack of testing of the model framework. The collection of data for a preliminary analysis in a timely manner suffered some logistical setbacks that may require more time and effort to overcome. In addition, the depth literature of available for the context of Kenya is either difficult to obtain or scarce. The fact that this is an emerging front in Kenya's financial economy may partially explain such scarcity. In this case, similar studies in the distant future may afford a wealth of literature to draw from.

APPENDIX

1. In its modern form, the quantity theory builds upon the following relationship

$$M \times V = \sum(pi = qi) = ptq$$

Where,

M= the total amount of money in circulation during the period

V = transactions velocity of money

p_i and q_i = the price and quantity of the i -th transaction.

p = column vector of the p_i , and the t is a superscript representing the transpose operator.

q = column vector of the q_i .

The equation of exchange is a simplified variation accepted in economics.

REFERENCES

Acharya, V. and Bisin, A. (2005), "Optimal Financial-Market Integration and Security Design," *The Journal of Business*, Vol. 78, No. 6 (November), pp. 2397-2434

Aker, Jenny C. (2010). "Information from Markets Near and Far: The Impact of Mobile Phones on Agricultural Markets in Niger." *American Economic Journal: Applied Economics*

Akinlo, A. (2012) "Financial Development and the Velocity of Money in Nigeria: An Empirical Analysis," *The Review of Finance and Banking*, Vol. 4 No. 2, p.97-113

Alliance for Financial Inclusion, AFI (2010) "Enabling Mobile Transfer: The Central Bank of Kenya's Treatment of M-pesa," a case study.

Business Daily, (2012) November 8 ed. "Mobile Banking Revolution Gathers Pace, Opens New frontier for Profits," available at:

<http://www.businessdailyafrica.com/Mobile-banking-revolution-gathers-pace/-/539552/1056156/-/p4aussz/-/index.html>

Business Today (2011), December 11 ed. "A New Velocity of Money," available at: <http://businesstoday.intoday.in/story/innovation-M-pesa/1/20189.html>

Cruz, Pedro, et al (2010) "Mobile Banking Rollout in Emerging Markets: Evidence from Brazil." *The International Journal of Bank Marketing*, 28.5 p. 342-71

Comminos, A., Esselaar, S., Ndiwalana, A. and Stork, C. (2008), "M-banking the Unbanked, in Towards Evidence-based ICT Policy and Regulation, Vol. 1, Paper 4, available at: www.researchictafrica.net/new/images/uploads/RIA_Mobile-banking.pdf

Communications Commission of Kenya, 2012 "*Quarterly Sector Statistics Report*," July-September, available at: www.cck.go.ke/resc/downloads/SECTOR_STATISTICS_REPORT_Q1_12-13.pdf

De Koker, Louis (2007) "Aligning Anti-Money Laundering, Combating of Financing of Terror and Financial Inclusion." *Journal of Financial Crime* 18.4 (2011): 361-86.

Fisher, Irving (1911) "The Purchasing Power of Money" New York: MacMillan

Geertz, C. (1978), "The Bazaar Economy: Information and Search in Peasant Marketing", *American Economic Review*, Vol. 68 No. 2, p. 28-32.

Jensen, Robert T. (2007). "The Digital Divide: Information (Technology), Market Performance and Welfare in the South Indian Fisheries Sector," *Quarterly Journal of Economics*, 122(3), p. 879-924

Lars-Hendrik, R. and Waverman, L. (2001), "Telecommunications Infrastructure and Economic Development: a Simultaneous Approach", *American Economic Review*, Vol. 91 No. 4, p. 909-23.

Laukkanen, Tommi, et al. (2013) "Innovation Resistance among Mature Consumers." *The Journal of Consumer Marketing* 24.7 (2007): p.419

Makin, Paul. "Regulatory Issues Around Mobile Banking," *OECD Report* available at: www.oecd.org/ict/4d/43631885.pdf

Mankiw, N. G. (2000). *Macroeconomics* (4th ed.). New York: Worth Publishers

Mas, Ignacio (2009) "The Economics of Branchless Banking," *Innovations* Vol. 4 No.2, p.57-75

Mbiti Isaac, Weil David (2011) "Mobile Banking: The Impact of M-PESA in Kenya," *NBER Working Paper Series*, Working paper No. 17129 available at: www.nber.org/papers/w17129

Mihaljek, Dubravko (2011) "How have External Factors Affected Monetary Policy in the EMEs?" *BIS Papers* No. 57, October, available at: www.bis.org/publ/bppdf/bispap57a.pdf

Mrouhe, Malek (2013) Total Systems Services Inc. White paper on Branchless Banking, available at: <http://www.tsys.com/Downloads/upload/Branchless-Banking-WP-012913-print.pdf>

Nagarajan, G., and Haas, S. (2011), "Measuring the Impact of Financial Services on the Developing World," *IRIS Report*, July, available at: www.fsassessment.umd.edu/publications/mobile-money-kenya.html

Olatunde, J. O., Omobola A. S. and Olajide O. E. (2013) "The Role of Financial Intermediaries in Elite Money Laundering Practices." *Journal of Money Laundering Control* 15.1 (2012): 58-84.

Ondiege, Peter (2010) "Mobile Banking in Africa: Taking the bank to the People," *Africa Economic Brief*, Vol. No.8 available at:
www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/John%20brief%201_John%20brief%201.pdf

Rolf, H. Weber, and Aline Darbellay (2010). "Legal Issues in Mobile Banking." *Journal of Banking Regulation* 11.2: 129-45.

USAID (2010), Situation report on "Kenya- Food Insecurity," fact sheet No. 9, September.

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