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Effects of Mobile Banking on the Liquidity of Commercial Banks in Kenya

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Abstract:

Liquidity held by commercial banks depicts their ability to fund increases in assets and meet their financial obligations as and when they fall due. In 2015 and 2016, CBK placed 3 commercial banks in receivership in a record period of 9 months sparking panic in the financial market. This study sought to assess the effects of m-banking, a new platform bank customer is using to access bank services on liquidity of commercial banks. In the efforts to estimate the implications of m-banking phenomena, this study sets out to bring to light the critical changes in bank liquidity models arising from the emerging m-banking technology innovations. The study was structured to provide strategic insights into the m-banking services offered by banks and a review of emerging risks and challenges in liquidity management of commercial banks. The paper was based on a study of Effects of M-banking on Liquidity of Commercial Banks in Kenya. The study used a cross-sectional descriptive design that provided a snapshot explanatory relationship between the main independent variables of m-banking products and liquidity levels. The study covered commercial banks operating in Kenya. The target population was two officers working in finance and risk departments from the 40 commercial banks operating in Kenya as at June 2017. Data was then produced from the respondents using structured questionnaires that were administered through the drop and pick method. Data analysis was done using both descriptive and inferential statistics. Regression analysis was used to determine the relationship between variables. The study established that there was a strong relationship between the liquidity of the bank and deposit mobilized through m-banking transactions. The study recommends that commercial banks should focus on liquidity management models that incorporate m-banking deposit.

Keywords: M-banking deposit services, pay-bill services, liquidity

1. Introduction

In the wake of financial technology, a huge development known as m-banking has rocked the banking sector. The model which takes alternative delivery channels to a whole new level provides a paradigm shift from traditional banking. The advent of mobile banking, a platform which allows people to use their mobile phones like wallets to transfer money from one account to another, pay goods and services as well as conduct banking services such as depositing and borrowing at the comfort of their seats or homes has started to have a transformative effect at a faster pace than previously envisaged (Kulabako, 2010). The continued growth of uptake of mobile services by Kenyans which hit 88% by June 2017 (CA 2016) has played a pivotal role in exploiting these fairly new technologies of m-banking. The banking sector is now characterized by a rapid uptake of various m-banking services key among them m-bank deposit services. M-Banking is the latest Financial Technology innovation that has progressively rendered itself in universal ways cutting across numerous services. (Njenga, 2016)

Dahlberg (2008) observed that mobile banking services in the developing world enable users to do three things namely; store value of their money (currency), convert the stored value to cash when the need arise and lastly transfer stored value for exchange of goods or services through payment. On the other hand, banking involves taking small deposits from many customers as liabilities to fund large loan facilities. Whereas demand deposits can be withdrawn by owners without giving the bank a notice, loans advanced to customers cannot be called upon before their due date. Commercial banks' assets are therefore funded by demand deposits whose maturity tenors do not necessarily match with the loans advanced to the customers (Kashyap, 2002).

According to CBK (2013) prudential guidelines, the portion of the deposit that is not lent to customers as loans, part of it is deposited to the Central bank to be held as Cash Reserve Ratio (CRR) and the remaining held as cash or invested in short-term assets such as overnight lending and other marketable assets such as government treasuries. Marketable assets are those assets that can easily be converted into cash without incurring the cost to meet liquidity requirements for the commercial bank. This model of funding where commercial banks fund their long-term assets (term

loans) with demand deposits whose maturity tenor is said to be 'on demand' makes it important for Commercial banks to develop a predictive financial model to help the bank maintain liquidity that is just enough to meet the daily demand for the customers withdrawing their deposits (Elliott, 2014). In this predictive model, the main variables become the customer behavior, available channels of accessing funds, macroeconomic factors, and perceived safety of the commercial bank against collapsing risk amongst others (Wehinger, 2013).

Commercial banks hold a unique position in the economy of a country, their interdependency to one another makes it even critical to the economy because a problem of one bank is enough to trigger a contagion liquidity risk in the entire industry putting the entire economy at stake (CBK, 2016). According to Heffernan (2005), available evidence suggests that technology has substantially transformed brick and mortar banking, reducing the cost of doing business even after the capital investment required is factored in. These changes in technology, market globalization, and consumer behavior have resulted in commercial banks' reviewing their delivery channels, liquidity level requirements and product offering (Athanasoglou, Brissimis, & Delis, 2005).

1.1. Profile of Commercial Banks in Kenya

There were 40 commercial banks in Kenya as at 31/12/2016 (CBK 2016). These commercial banks had a total net asset of KES 3.7 trillion as at 31/12/2016. The 40 commercial banks are categorized by CBK as; public local commercial banks (3 banks), local private commercial banks (24 banks) and foreign commercial banks (13 banks) as detailed in Table 1 below.

Category of commercial Bank	Number	%	Asset	%
Public Local Commercial Bank	3	7.7%	145,451	3.9%
Private Local Commercial Bank	24	59.0%	2,406,742	65.1%
Foreign Commercial Bank	13	33.3%	1,143,751	30.9%
Total	40	100.0%	3,695,943	100.0%

Table 1: Ownership and Asset Base of Commercial Banks (Kenya Shillings M)

Source: (CBK 2016)

As at December 2016, these commercial banks had 1,541 branches spread across the country with the number having increased by 18 branches from the previous year (CBK, 2016). Nairobi, the capital city of Kenya has the highest number of these branches and its home to all bank's head office. CBK also classifies Kenya commercial banks according to market share using a weighted composite index that comprises net assets, customer deposits, capital and reserves, number of deposit accounts and number of loan accounts. A bank with a weighted composite index of 5% or above, is classified as "Large Bank". As at December 2017, there were 6 such banks in Kenya. Under this classification, there are three categories of commercial banks. "Large banks"

A bank with a weighted composite of less between 1 and 5, is classified as "Medium Bank" and as at December 2017, there were 14 such banks in the country. Banks with a weighted composite of less than 1 are classified as "Small Banks" and there were 20 such banks as at December 2017. The market share of these banks is captioned in Table 2 below.

Category	Number	Market Share
Large Banks	6	65.32%
Medium Banks	14	25.90%
Small Banks	20	8.77%
Total	40	100.00%

Table 2: Peer Classification of Commercial Banks and Their Market Share

1.2. Objective of the Study

The objective of this study was to investigate the effects of mobile banking on the liquidity of commercial banks in Kenya.

1.3. Research Hypothesis

- H₀₁: There is no significant relationship between m-banking deposits and the liquidity of Commercial banks in Kenya
- H₀₂: There is no significant relationship between m-banking pay bill services and the liquidity of commercial banks in Kenya

2. Theoretical Framework

The concept of liquidity requirement was first postulated by John Maynard Keynes in his book; *The General Theory of Employment, Interest, and Money* (1936) to explain the determination of the interest rate by the supply and demand for money. Liquidity requirement theory asserts that individuals or investors prefer to hold cash as opposed to cash equivalents.

In this theory, Keynes explains three motives for holding money: first, the transaction motive. The transactions motive refers to the fact that individuals have a preference for liquidity in order to guarantee to have sufficient cash on hand for basic transactions because income is not always readily available. With this motive, the level of an individual's

income determines the amount of liquidity that is demanded; higher income levels demand more money to accommodate increased spending.

Secondly is the precautionary motive. The precautionary motive is related to individuals' preference for liquidity as additional security in the event that an unexpected occasion or problem arises that requires a substantial outlay of cash.

Thirdly is the speculative motive. Individuals also have a speculative motive, based on the belief that investment securities prices may begin to significantly decrease thus offering the investor the opportunity to use liquid funds to make an investment offering a more attractive rate of return. Basically, the speculative motive refers to investors' general reluctance to commit to tying up investment capital in the present for fear of missing out on a better opportunity in the future.

From this theory, individuals keep cash for three reasons - to carry on daily transactions, meet the unexpected emergency, and for the unexpected opportunity. With mobile banking solutions that guarantees access to cash instantly, individuals have no motive to keep cash in their houses as the same is available through the m-banking. Instant access of money from the bank coupled with security and other cost of handling cash, there has been a shift where individuals are banking all their cash through such services as m-bank deposits. Dahlberg (2008) observed that mobile banking services enable users to do three things namely; store value of their money, convert the stored value to cash when the need arise and lastly transfer stored value for exchange of goods or services through payment. This observation concurs with liquidity preference theory and has been the power behind the rapid growth of m-bank services.

3. Methodology

Discussion of this paper was based on a descriptive research design which involved collecting data that describe liquidity situations at different scenarios. The data was then tabulated, organized and analysis performed to arrive at the conclusions and recommendations of the paper. The study was informed by quantitative survey on commercial banks operating in Kenya through a stratified sampling where commercial banks were clustered into three main categories of Large; Medium and Small banks as classified by Central Bank of Kenya.

According to Mugenda and Mugenda (2003), this design is a process of collecting data in order to address the questions of the state of the subject under study. The advantage of this study is that, it describes behaviour, attitude, characteristic and values. The design was also favoured because it gives an opportunity to use both quantitative and qualitative data, so as to find data and characteristics about the population or phenomena that are being studied.

The study was carried in Nairobi Kenya. This area was chosen because all commercial banks operating in Kenya have their head offices in Nairobi in which finance and risk departments sit which were the main focus for this study. The target population for the study was 40 commercial banks operating in Kenya as at 30th June 2017 (CBK 2017). For each sampled commercial bank, two members of staff (Finance Manager and Risk Manager) were given each a questionnaire making the total number of respondents in the study to be 80 if the entire population was sampled. However, the study applied stratified random sampling where a sample population was selected from the 40 commercial banks in the 3 main clusters of Large, Medium and Small Banks. A random sampling was applied to select 60 respondents from across the three strata. The sample size for each stratum was computed using the Nassiuma (2000) formula.

$$n = \frac{NC^2}{C^2 + (N-1)e^2} \quad \dots\dots\dots\text{Equation (3.1)}$$

Where: n = sample size, N = population size; C = coefficient of variation; $20\% \leq C \leq 30\%$ 50% , e = error margin; $0.02 \leq e \leq 0.05$. Substituting these values in the equation, estimated sample size (n) is:

$$n = \frac{80(0.3)^2}{0.3^2 + (80-1)(0.02)^2} = 59.21$$

$$n \approx 60$$

Using this random sampling approach; the study allocated a proportionate sample size as per the Table 3 below.

$$n_h = \left(\frac{n}{N}\right)N_h \quad \text{Where } n_h \text{ is the sample size of strata; } N_h \text{ the population size of the strata } h$$

Bank Category	Population	Target Population	Sample Size $\left(\frac{n}{N}\right)N_h$
Large Banks	6	12	9
Medium Banks	14	28	21
Small Banks	20	40	30
Total	40	80	60

Table 3: Sample Size
Source: Researcher 2018

4. Data Analysis and Presentation

After all data has been collected, the researcher conducted a data coding and entered in the computer for analysis using the Statistical Package for Social Sciences (SPSS). Data was then analyzed using descriptive statistics such as frequency counts, percentages, chi-square test for agreement. The relationship among variables was analysed using weight of each variable in multiple correlations. A linear multiple regression analysis was carried out to determine the relationship between predictor variables (M-banking products) and the dependent variables (Liquidity ratios)

4.1. Results and Discussion: Effects of M-Banking Deposits on the Liquidity of Commercial Banks

From the survey conducted, key results obtained from this study are analyzed and discussed in detail below. Table 4 tabulates the results for various questions fielded to the respondents to assess the effects of m-bank deposit on the liquidity of commercial banks. The table further tabulates the findings alongside Chi-square and its probability (P) for each aspect from which study discussion is based. It's imperative to mention that respondents were asked to rank each assessed aspect in a Likert scale of 1 to 5 where 1-signified very low volume (VL), 2-low volume (L), 3-average volume (A), 4-high volume (H) and 5-very high volume (VH). The data on the table was employed as an evidence to base and anchor the discussions and subsequent conclusions.

	VL	L	A	H	VH	χ^2	$P > \chi^2$
M-banking deposit contributes high volume in deposit mobilization.	11.40	31.80	31.80	15.90	9.10	10.77	0.05
The bank has high volume of m-banking deposits	6.80	43.20	25.00	20.50	4.50	21.45	0.01
Customers prefer to use m-banking deposit	6.80	6.80	56.80	20.50	9.10	40.10	0.001
The bank's volume has increased with m-bank deposits	6.80	20.50	31.80	38.60	2.30	21.45	0.01
M-bank deposits have no effect on the level of Liquidity Deposit Ratio of the bank?	22.70	43.20	18.20	11.40	4.50	18.95	0.01
What's the effect of m-bank Deposits on the level of Liquidity Coverage Ratio of the bank?	27.30	29.50	27.30	11.40	4.50	11.22	0.05

Table 4: Effects of M-Banking Deposits on the Liquidity of Commercial Banks
Source: Research 2018

From the survey conducted, it emerged that m-bank deposit services do not contribute significantly to deposit mobilization of banks. A majority of 31.8% ($\chi^2 = 10.77$, $P < 0.05$) disagreed that the service has made significant contributions to deposit mobilization activations run by banks periodically to boost their liabilities in their quest to fund their loan book. An equal number of respondents was indifferent on the same with a paltry score of 15.9% agreeing that indeed m-bank deposits are instrumental in deposit mobilization. This observation is line with those made by Njenga (2010) who observed that the field of m-banking is fairly new and rural folks with low literacy levels are getting challenges in using the technology even though evolution of m-banking is changing this trend.

On the contributions made by m-banking deposits on overall deposit volumes of the bank; 43.20% ($\chi^2 = 21.45$, $P < 0.01$) disapproved the significance. This result is consistent to those made by Goyall (2012) in which he observed that in order for mobile payment service to become acceptable in the market, simplicity and usability are critical. The payment application must be simple and user friendly. The customer must also be able to personalize the application or process. Noting that the large rural population is illiterate and mobile technology requires a significant level of literacy to navigate through the process, the volumes from this source are yet to reach the critical majority for many banks to start realizing the change.

Regarding to the customer preference to the use of m-banking deposit services; it was observed that there has been a steady growth of customers registering to m-bank services and the preference to m-bank deposit services was fueled by low cost of banking and access to bank services in the remote areas. This is aptly demonstrated by 20.5% ($\chi^2 = 40.1$, $P < 0.001$) score of customer preference to m-bank deposit who agreed with a further 9.1% strongly agreeing. However, a significant majority of mean score 56.8% were indifferent of whether or not the service was preferred by customers. CBK (2007) statistics put the average monthly cost of operating a current account with a Kenyan commercial

bank at over Ksh 900 (\$13). Njenga (2010) in his study found that m-banking reduces the cost of basic banking services to customers with over 60 percent from what it would cost through traditional channels. The electronically managed transactions result in huge cost savings, the benefits of which are transferred to the users. Access to the bank services by rural folks who would otherwise cover kilometers to urban centers where banks are situated is another factor that has seen an increase in popularity of m-banking services.

The upsurge in registration of customers to m-banking was underscored by the high score of 38.6% ($\chi^2 = 21.5$, $P < 0.01$) for increased bank deposit from m-banking deposit services. This increase has significantly increased the adoption of m-banking services and deposit services are gaining prominence by each day. Bonface and Ambrose (2015) found that mobile money has empowers people by giving them the confidence and independent way to secure and control funds that is private and inaccessible to other members of the family. King (2012) supported that mobile money has created a value proposition for security and efficiency. Mobile deposit service is now being employed by corporates as a mean to payments to avert both the high cost of handling cash as well as corruptions cases attributed to cash handling.

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