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EFFECT OF ALTERNATIVE BANKING CHANNELS ON LIQUIDITY OF COMMERCIAL BANKS IN KENYA

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ABSTRACT

Commercial banks depend on customer deposits to create assets by advancing loans to households and entities in need of capital. Customers also would be in need of their deposits from time to time and in some cases without notice. A delicate balance should therefore be made by commercial banks to ensure that enough funds are availed for unpredicted deposits while also advancing loans. Liquidity – easily convertible assets – can be achieved through encouraging deposits in customer accounts easily and conveniently, a threshold which is regulated by the banking sector regulator. This study examined the effect of alternate channels of banking on the liquidity of commercial banks in Kenya. Specific research objectives included to determine the effect of mobile banking, internet banking, ATM banking and agency banking on the liquidity of commercial banks in Kenya. The study relied on the Technological Acceptance Model, Diffusions of Innovations, Technological Determinism and Agency theories forming the theoretical and empirical reviews from previous studies. The study adopted a descriptive research design with the population of the study being 60 market monthly observations on liquidity of the licensed commercial banks in Kenya as at 31st December 2018 where through census sampling, secondary data for a five year period between 2014 and 2018 was collected from central bank supervision reports and banks' financial statements. The time series regression model was adopted for the research and data was analyzed using both descriptive and inferential statistical analysis with the help of the Statistical Package for Social Sciences (SPSS). Results of the study revealed a positive and significant effect of mobile banking, ATM banking and Agency banking on the liquidity of commercial banks although internet banking showed a negative and significant effect on liquidity of commercial banks. There is need for the regulator to review the regulated liquidity ratio of commercial banks in the wake of increased adoption of alternative channels of banking. Banks should also assess their adequacy in the investment on alternate banking channels to take advantage of liquidity from these sources while enhancing customer experience.

Key words: *Alternative Banking Channels, Mobile Banking, Online Banking, ATM Banking, Liquidity*

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INTRODUCTION

The advancement in technology has given rise to alternate channels of banking which have resulted in tremendous changes in the financial industry in recent years (Hughes, 2001). The major component of commercial banks' assets is the loans advanced to customers (King, 2013). Loans are advanced to customers from the deposits made into their bank accounts – which form the larger component of the banks' liabilities. These liabilities can be called up any time through withdrawals via numerous channels and thus proper balancing act should be adopted to ensure enough is available for withdrawals (Dinh, 2015).

The optimum balance is achieved with focus on the ease with which banks avail the customer deposits to them with the increased channels and avenues of access by customers to their deposits (Glykas, 2010). Banking, the activity of accessing and utilizing the banking services offered by commercial and otherwise banks, has evolved in their business models over time. Conventionally, the access to the banking financial services was made possible through a physical branch (building).

Alternative banking channels, defined as those channels that expand the reach of services beyond the traditional bank branch channel, have emerged as a result of innovations in information and communication technology and a shift in consumer expectations (IFC, 2014). ABCs are transformative in nature, accommodating the demand for access to financial services anytime, anywhere, anyhow (King, 2013). New technologies increase efficiency through automation, reduce operational costs, and improve service quality by cutting down on waiting times and offering more convenient access and reduced cost to the end-consumer(Connors, 2017).

According to Njilu (2016), banks are prone to technological obsolescence and therefore, respond swiftly to variations in both economic and technological environment to not only maintain but also increase their customers. Banking technology has increased transactions which ultimately have direct and indirect impact on banks' liquidity. The use of ATMs, POS and Electronic Funds Transfer, cut cost and speed up payments. They enable instant global access to information, products and services therefore, customers do banking transactions anywhere anytime (Njilu, 2016).

The contemporary banking services included the deposits and withdrawals of the monies, and access to credit facilities (Connors, 2017).During the 1990s, the number of active units in Europe rose by a staggering 50% (Freedman, 2000). Originally members only used the ATM to withdraw cash, the ATM has evolved to support a wide variety of services, including deposits and account details. To counteract the impersonal impression of the so-called *hole in the wall*, the Spanish bank BBVA has developed its "future ATM", an innovative touch screen interface with customized shortcuts to reflect individual user requirements.

The use of the Automatic Teller Machines (ATMs), Mobile banking, Internet banking, Agency banking and the Point of Sale (POS) banking has improved ease and convenience by customers to access their money (Njilu, 2016). Liquidity of commercial banks is their ability to meet their short term cash requirements. These are majorly the ease with which they avail the customer deposits to them with the increased channels and avenues of access by customers to their deposits (Glykas, 2010).

The financial inclusion story well-known in Africa is mastery and art of the incorporation of technology in financial services (FSD, 2015). The combination of the two has led to accelerated rise in mobile money transactions and use (Mastercard Foundation, 2016). According to 2015 Global Findex, 12% of adults in Sub-Saharan Africa – half of them not having any other bank account - have a mobile money account. In Eastern Africa, Global Findex, notes that rates are

much higher. Kenya, for instance, has "the highest share of adults with a mobile money account, at 58 percent, followed by Somalia, Tanzania, and Uganda with about 35 percent.

In Ghana, banking service delivery was re-engineered with the introduction of technology and several new products such as: internet banking, Automated Teller Machines (ATMs), phone banking / cell banking, debit cards, credit cards (Birch & Young, 2015). All banks often communicate relevant information through electronic mail (e-mail) or short messages on phone to their customers. Banks also have their websites to promote their products and services as well as publicize information that is relevant to the public about the bank. The use of cards and online banking transactions has improved the ease with which customers access in Africa transact on their accounts.

The Kenyan financial sector consists of 43 commercial banks which are government owned, private owned and foreign owned (CBK, 2017). With the increased number, competition has set in with digital restructuring as the focal point. One of the competition strategies adopted by banks is provision of banking products and services through the use of channels that are complementary to the "mortar and brick" banking (FSD, 2015). In some instances these channels have been mutually exclusive to the branch banking model. The alternate channels include the ATMs, POS, internet banking, mobile banking by virtue of their efficiency, lower cost, flexibility, customer service, convenience, real-time money transfers and borderless banking (Allen & Santomero 2010).

According to CBK (2017) the uptake of the National Payments System continued to increase as reflected in usage of the Real Time Gross Settlement System (RTGS), the Kenya Electronic Payments and Settlement System (KEPSS) and the East African Payment System (EAPS). Activity through KEPSS and EAPS increased by 17.1 percent and 8.5 percent in volume and value, respectively in the year to June 30, 2017. The average amount moved per transaction declined by 7.3 percent, which indicates increased usage for lower value payments. The increasein uptake is attributed to continued expansion of trade within the East African Community buoyed by increased awareness by the public of the RTGS as a safe and efficient mode of payment for both high value and time critical payments for local and regional payments. EFT transactions based payments rose by16 percent in 2017; from Kes. 513 billion in 2016 to Kes. 595.8 billion in 2017 (CBK, 2017). However,the value and number of transaction effected through ATM leveled out. Mobile phonemoney transfer transactions increased by 26.43 percent from 1,002.25 million transactions in 2015 to an average 1,267.14 million transactions in the year 2017 (CBK, 2017).

Statement of the Problem

Banks are faced with an array of risks in their day-to-day business of financial intermediation and the most critical of the risks is the Liquidity risk (Erik, 2014). Liquidity risk is the uncertainty of banks over their ability to service their short term liabilities and commitments as they fall due. As the use of alternate channels of banking quickly take shape in the banking space, more and more customers are able to access their funds faster, easily and more conveniently – even at the comfort of their offices and homes. Consequently, they are able to make deposits into their bank accounts in the same breadthFreedman (2000). Banks therefore, are forced to enhance their liquidity plans and levels to cater for this increased activity in the customer's account. They should hold easily convertible assets to fund the unpredictable withdrawals requirements by the customersso as to avoid bank runs – the demands by customers to withdraw all their deposits at once which would have been committed to long term investments by banks through loans (Njilu, 2016)).

Increased usage of alternate channels of banking has led to a proportionate growth in financial inclusion

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(Kambua 2013) .The increase in uptake is attributed to continued expansion of trade within the East African Community buoyed by increased awareness by the public of the RTGS as a safe and efficient mode of payment for both high value and time critical payments for local and regional payments. EFT transactions based payments rose by 16 percent in 2017; from Kes. 513 billion in 2016 to Kes. 595.8 billion In 2017 (Njilu, 2016)). More banks are embracing the alternate channels of banking as a competitive strategy to increase market share and boost financial performance but with little attention on indirect impacts. Internationally, studies relating to electronic banking and liquidity have been carried out (Njilu, 2016). Both global and local studies on the use of alternative banking channels have found mixed results. Studies have been made covering electronic banking but from the studies reviewed inadequate research has been done on the relationship between alternate channels of banking and liquidity of Commercial Banks in Kenya. This research aimed at establishing this relationship.

Research Objective

The general objective of the research was to find out the effect of Alternative Banking Channels on Liquidity of Commercial Banks. The specific objectives were;

- To determine the effect of mobile banking on liquidity of commercial banks in Kenya.
- To examine the effect of online banking on liquidity of commercial banks in Kenya.
- To explore the effect of ATM banking on liquidity of commercial banks in Kenya.
- To find out the effect of agency banking on liquidity of commercial banks in Kenya.

LITERATURE REVIEW

Theoretical Framework

Technological Acceptance Model

Propositioned by Davis (1993), the model concentrated on the primary goal of explaining the factors affecting computer applications' reception in general and how users come to accept and use technological banking channels like mobile banking. The model explains why a specific technological system is acceptable or rejected. An information system will be accepted or rejected based on the users' view on ease of use and usefulness. Incorporation of the banking capabilities on phones has enabled the mobile phone to be more than just a phone. A setup that is easy to use and would craft work easier can be readily accepted. The model implies that, other elements kept constant, perceived usefulness of a system is dictated by the perceived ease of use (Davis, Bagozzi, & Warshaw, 1989). The theory emphasized on user encouragement to make the employees accept and easily adapt to changes (Ajzen & Fishbein's, 1980). According to this theory, PU and PEOU dictate whether a user will accept or decline a technology. An employee will embrace a technology that is easy and work friendly (Davis, 1989). Therefore, the success of a new banking technology is controlled by both employees and customers. For instance ease of use and convenience in mobile banking would motivate customers to explore its features and the details of the system (Kusuma & Susilowati, 2007).This model only concentrated on perceived usefulness and perceived ease of use as the only influencer of individuals on their adoption of certain technology. It did not consider other factors. Moreover, the model did not conclusively and in detail, discuss the motivation of users to accept mobile banking as a way of transacting their banking activities.

Diffusion of Innovations Theory

The theory proposed by Rogers (2003) is one of the most popular models in investigating the behavior of potential users in adopting new technological innovation. This theory, which stipulates that an individual first acquires knowledge about a new innovation, subsequently being persuaded towards implementation.

Persuasion as proposed by the theory is depicted by five different characteristics; Relative advantage that refers to the degree to which an individual perceives that a particular innovation is superior to another, Compatibility which refers to the extent to which an individual believes that a particular innovation is consistent with existing values, earlier experiences and current needs, Complexity whose concern is the degree to which an individual believes that a particular innovation is difficult to understand and use, trial abilityreferring to the perception on extent to which a particular innovation can be experimented on a limited basis; and Observability that refers to the extent to which the results of a new innovation can be seen by individuals (Rogers, 2003).

This theory further postulates that while an individual is persuaded to implement new innovation, the decision as to whether to implement it or not is made. After the implementation phase, the individual confirms the previous adoption or rejection decision (Njilu, 2016). In summary, diffusion of innovations theory proposes that technological ideas, practices or objects as innovation are communicated via particular channels over a period of time within members of a social system.

Technological Determinism Theory

Technological Determinism Theory as proposed by McLuhan (1969) strives to explain that technology is a key determinant of change and that technological forces drives our political, economic, cultural and social life. A given technology defines many factors in the society but only for a specific period. On the other hand, the degree of technological acceptance, impact and usage will be controlled by the social context. Capitalism determines the rate of technological change (McLuhan, 1969). An invention once introduced into a society influences its own life. For instance the introduction or invention of the ATM machines in the banking industry considerably changed the way customers utilized their money. The key concern has been the efficiency, flexibility and convenience that has accompanied the ATM machines. Most banks have persistently embraced the modernization and computerization of their services to allow their customers enjoy the ease with which they relate and interact with the bank and their monies. Some ATM, through technological advancement have even been able to empower customers' cash and cheque deposits into their bank accounts without visiting a banking hall. Individuals and institutions keep updated technologically to fit in the society (Smith, 1994). Banks keep pace with technology to be competitive in the prevailing business environment. The theory focused on social, cultural and political factors as the determiners of technological advancement. The theory was limited to holding the assumptions constant although it would be noble to take into account the fact that the society is dynamic and culture is not fixed. Additionally, the theories did not directly link the variables proposed to alternate banking channels.

Agency Theory

Agency theory was proposed by Jensen and Meckling (1976) and it analyzes the relationships between owners of businesses and their agents, recognized under law as the business managers on behalf of the owners. The key issues in agency theory center upon whether adequate mechanisms exist that motivate managers to act in ways that maximize the utility of a firm's owners where ownership and control are separated. Under the terms of agency theory, a principal (P) passes on authority to an agent (A) to conduct transactions and make decisions on behalf of

the principal in an effort to maximize P's preferences regarding wealth creation and profit maximization. Agency problems can arise if: P and A have different goals; P and A have disparate skills in evaluating A's performance; P and A possess different sets of information relevant to the managerial decisions A must make as a representative of P; or P and A have different degrees of risk aversion. At the core of agency problems is the fact that principals may not be able to monitor agents, either perfectly or costless, as to the agent's actions or the information behind those actions. In commercial banking, agency problems may arise in this context from three principal sources: failure by selected agents to adhere to the prudential guidelines on customer service so that the customers may not get the intended service from a bank agent as they would in a bank's premises and/or branch, ownership of a bank agency by individuals who are still bank owners and/or managers and who, therefore,, may behave differently than utility-maximizing owners alone; and, the existence of informational asymmetry where bank agents and the bank managers/owners do not share the same information especially regarding tariff and product changes. The limitation of this theory with regards to the study is the failure of the theory to explain the effect that agency banking may specifically have on liquidity of commercial banks. The theory did not also consider the agency costs in the application of the theory in agency banking and how the same can be incurred in an economic manner.

Conceptual Framework

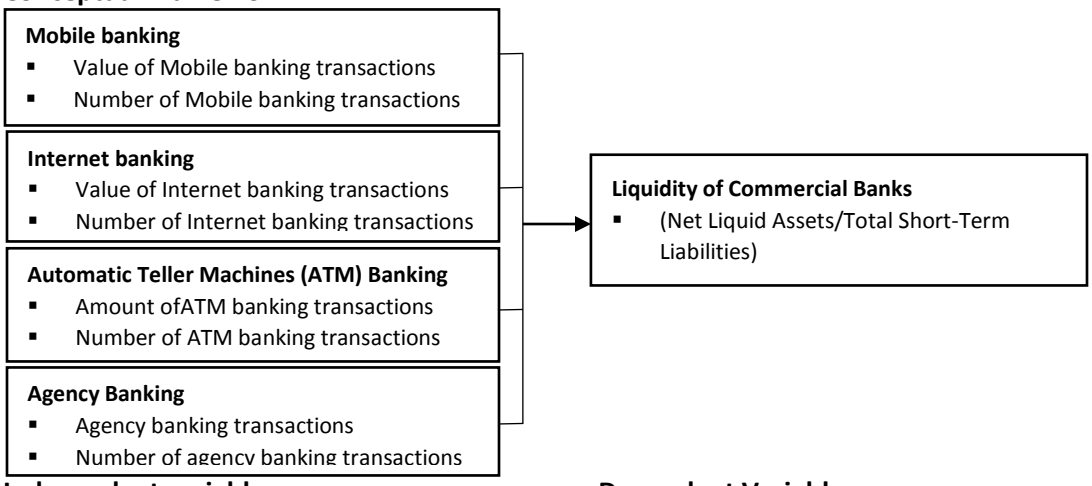

Figure 1: Conceptual Framework

Source: Author (2019)

Empirical Literature

Kamesam (2001) did a study on the variations that occurred in the Indian banking industry following a period of amplified technology adoption by banks. The results showed that technological progress enriched level of profitability of the banks.

Ghodrati & Khah (2014) sought to determine the relationship between mobile banking and liquidity management on banks in Iran and one of conclusions was that there is a strong linear relationship between e-banking development and the ratio of liquidated assets to total assets.

Al-Jabri (2012) studied on mobile banking adoption by looking at the application of diffusion of innovation theory and determined that with better mobile banking capability and provision of acollection of services, the more useful customers perceive mobile

banking to be useful and readily adopt the same. Al-Jabri (2012) suggested, banks must strive to reduce negative perception by their customers by offering specific guarantees protecting them and taking their complaints seriously and urgently. Adetunji (2013) investigated on the adoption of mobile banking in Nigeria and found out that age, educational qualification, relative advantage, complexity, compatibility, observability and trialability are important determinants of the adoption of mobile banking (Njilu, 2016).

Sathye (2005) studied the effectiveness of Internet banking on performance and operating risk profile of credit unions in Australia and the consequence showed no correlation. Hasan et al. (2002) did a research to explore whether financial institutions that had adopted internet banking were performing better than those that had not. They found out that the latter were performing better than those that had not embraced internet banking. This was mostly because most of the customers who used internet banking transacted frequently leading to more revenue generated. Electronic banking adoption by customers also led to reduced costs by banks and increased operational efficiency in equal measure. These savings had a direct positive impact on the financial performance of the commercial banks (Njilu, 2016).

Ogare (2013) investigated the relationship between electronic banking and performance of Kenyan commercial banks. The results showed that as electronic banking usage rose, so did the performance of the banks revealing a positive correlation.

Rugimbana's (1995) study profiled users and non-users of ATMs in terms of demographic and perceptual variables. The main aim of the study was to differentiate users from non-users, using the demographic variables of respondents and their perceptions of ATM attributes in order to evaluate the relative importance of these variables. It came out that perceptual variables were more successful as predictors of ATM service usage than respondent demographic variables. Darch and Caltabiano (2004) studied the relationship between demographic, user-situational, attitudinal variables and ATM use in an Australia where a sample of older adults who conducted their own banking transactions was targeted. Technology, perceived control and perceived user comfort were found to have an independent significant effect on ATM usage.

Agency banking is the provision of banking services through agents recruited to act on behalf of a bank. Any form of payment can be used, such as cash, debit cards, credit cards, mobile payments and even Bitcoin (Kent, 2013). Agency banking machines have the capability of transacting faster thus spreading the costs to a merchant over the numerous transactions thus reducing costs. According to Davis, B. and Owens, J. (2016)., a POS transaction is safer when cards are used for shopping since the business owners' machines are linked to their bank accounts in which case, funds are credited in paperless and real time manner. They further noted that due to the capabilities of the POS machines to print receipts bearing the bank's name instantly authenticate the transactions and could be verified at any time in future. Abubakar *et al*. (2015) did a research to determine if there was a connection linking electronic banking and liquidity of deposit money banks in Nigeria. They found out that agency and mobile banking had no significant relationship with liquidity, while internet banking had a significant negative relationship with liquidity. Amu and Nathaniel (2016) carried out a study dubbed E-Banking and commercial bank performance in Nigeria and concluded from the results that POS as a form of electronic bank was not co-integrated with both the savings and time deposits but were co-integrated with demand deposits having used the cointegration model. The study therefore, recommended that the monetary authorities and commercial banks should embark on an all-inclusive enlightenment campaign for the banking public on

the benefits, convenience and importance of adopting e-banking channels in completing their transactions.

METHODOLOGY

The research design adopted for the study was that of descriptive and correlation design. The target population for this study comprised of 60 market monthly observations on liquidity and alternate banking channel data for commercial banks in Kenya regulated by the Central Bank of Kenya as of 31st December, 2018. Census sampling technique was applied where data on the independent variables were obtained from the Central Bank supervision report and Commercial banks' annual audited financial statements for purposes of this study.

The data collection sheets were used where records of data collected were keyed in before they were subjected to the analysis toolkit. Data was collected from the Central Bank of Kenya's annual supervision reports, published reports and other documents such as banking industry publication for the periods 2014 and 2018 on the counts and volumes of the alternate channels of banking transactions. Descriptive analysis through use of mean, minimum, maximum were used to show data patterns while standard deviation showed dispersion from mean. Data was checked for multicollinearity using variance inflation factor (VIF) and independent variables was correlated if they have correlation coefficient greater than 0.7 (Balatngi, 2005). Autocorrelation test was carried out using Durbin-Watson statistic test. Pearson's Correlation was employed to determine the relationship between the independent variable and dependent variable.

FINDINGS

Descriptive Statistics

Measure of Central Tendency

As shown in Table 1, the average value of mobile banking transaction was 100,224 million in a given year with a minimum of 92.466.4 million and maximum of 108.544 million. The average value of internet banking transaction 8,103 million with maximum of 9,439 million. Average value of agency banking has the highest variation as measured by the standard deviation of 7,995 followed by ATM transaction then the mobile transaction and finally the internet banking. Analysis of skewness and kurtosis shows that average value of mobile banking, internet banking and ATM transactions are asymmetrical around their mean and non-peaked except for agency banking transactions.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Mobile banking	60	92,466.4	108,544	100,224.12	3,815.34	.001	.309	-.319	.608
Internet banking	60	6,021.0	9,439.3	8,103.663	919.84	-.632	.309	-.580	.608
ATM banking	60	3,513.6	21,248.6	8,054.393	5,676.64	1.515	.309	.519	.608
Agency banking	60	4,058.1	50,246.6	6,916.520	7,995.00	5.199	.309	.264	.608

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Normality test

The table below showed the result of normality test to verify goodness of fit using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The P values are greater than 0.05 hence the model is passed the normality test which solves the problem of errors in skewness and kurtosis.

Table 2: Test for Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Mobile Banking	.057	60	.200*	.988	60	.809
Internet Banking	.143	60	.234	.921	60	.321
ATM Banking	.394	60	.099	.644	60	.100
Agency Banking	.397	60	.051	.271	60	.059

Inferential Statistics

Correlation analysis

The study analyses the effect of the alternative banking channels on the liquidity in the commercial banking sector. Karl Pearson correlation analysis was adopted in the study since all the variables were in ratio scale (Kothari, 2011).

Table 3: Correlation Analysis

Model		Liquidity	Agency banking	Internet banking	Mobile banking	ATM banking
Correlations	Liquidity	1.000				
		0.00*				
	Agency banking	0.58	1.000			
		0.00*	0.00*			
	Internet banking	-0.21	-.088	1.000		
		0.04*	0.00*	0.02*		
	Mobile banking	0.72	-.250	-.248	1.000	
		0.00*	0.00*	0.04*	0.13*	
	ATM banking	0.32	-.307	.660	.334	1.000
		0.02*	0.00*	0.00*	0.47*	0.74*

* Significance levels

Correlation analysis showed the strength of association between the study variables and also served as linearity test. Results of the study revealed positive and significant relationship between agency banking and liquidity (rho= 0.58, p value <0.05). This implies that an increase in agency banking increases liquidity. Secondly, there was a negative but not significant relationship between internet banking and liquidity (rho = -0.21, p value <0.05). This implies that an increase in liquidity may not be associated with an increase in internet banking transactions. Thirdly, there was a positive and significant relationship between mobile banking uptake and liquidity (rho = 0.72, p value <0.05). This implies that an increase in commercial banks' liquidity is associated with an increase in mobile banking. Finally, there was a positive and significant relationship between ATM banking and liquidity (rho = 0.32, p value <0.05). This

implied that an increase in liquidity is associated with an increase in ATM banking transactions. Further, there was no multicollinearity among the independent variables since none of them had correlation coefficient greater than 0.8 with each other and none of variance inflation factors was greater than 10 or tolerance limits less than 0.1.

Regression Model Analysis

The researcher applied the panel data collected as per data collection tool after logarithmic transformation to carry out the multivariate regression analysis. Coefficient of determination shows the degree of change in the variable. Liquidity is explained by alteration in the variables that are independent, for instance the alternative banking channels or the degree of variation in the liquidity in commercial banks, which is expounded by the four independent variable for alternative banking channels (average value of Mobile, Internet banking, agency banking and ATM transactions).

Table 4: Model Coefficients

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.366	.241	.203	.0420950	1.829

a. Predictors: (Constant), Average value of Agency transactions, Average value of internet banking transactions, Average value of Mobile banking transactions, Average value of ATM transactions

b. Dependent Variable: Liquidity Ratio

From the Multivariable regression statistics in the table above, R^2 = 0.366. This implies that alternative banking channels account for 36.6% of the changes in liquidity *ceteris paribus*. Further from Durbin Watson statistic, it shows that there is no presence of auto-correlation in the data.

ANOVA

Analysis of Variance statistics were also computed to find the fitness of the model in predicting the relationship between the study variables. From the ANOVA (Analysis of Variance),F (Fcalculated) = 1.043 t value of 0.003. This implies that the model is significantly fit.

Table 5: ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.007	4	.002	1.043	.003
	Residual	.097	55	.002		
	Total	.105	59			

a. Dependent Variable: Liquidity Ratio

b. Predictors: (Constant), Agency Banking, Internet banking, Mobile banking, ATM banking.

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From the ANOVA statistics in the above table 5, the data, which comprises the population parameters had a level of significance of 0.003, which confirmed that the data used, was suitable for concluding on the population's parameter at 95% level of confidence. Further, it also indicated that the regression model followed the Markov assumption of homoscedasticity. In addition, the sum of square due the regression is 0.02 while the sum of square due to residual is 0.02 at 4 and 55 degrees of freedom respectively.

Regression Coefficient

The regression coefficients in table 6 were utilized to come up with the model as shown below:

$$\mathbf{Y_{i,t} = 2.981 + 0.5078X_{1i} - 0.173\ X_{2i} + 0.313X_{3i} + 0.202X_{4i}}$$

Y = Liquidity of Commercial Banks,

X_1 = Mobile banking,

X_2 = Internet banking,

X_3 = ATM banking,

X_4 = Agency banking

Where mobile banking refers to average value of mobile banking transaction, internet banking refers to average value internet banking transaction, ATM transaction refer to average value Internet banking transaction and agency banking refer to average agency banking transactions.

Table 6: Regression coefficients results

Model	Unstandardized Coefficients			Sig.	Collinearity Statistics	
	B	Std. Error	t		Tolerance	VIF
(Constant)	2.981	2.348	1.269	.001		
Mobile Banking	0.507	.250	2.028	.000	.495	2.019
Internet Banking	-.173	.060	-2.883	.024	.315	3.177
ATM Banking	.313	.152	2.059	.000	.287	3.479
Agency Banking	.202	.089	2.270	.000	.877	1.141

According to the model, all the variables were vital based on their t statistic and standardized Beta within the confidence interval of the coefficients. Further, the Variance Inflation factor is within the tolerance level thus the regression model is significant.

Interpretation of the regression model coefficients

Mobile Banking and Liquidity

The coefficient of Mobile Banking means that the liquidity increases by 0.5078 when average value of mobile banking transaction increases by a unit. This variable was significant as its standardized beta lies between the 95% confidence interval. The result was in support of the hypothesis that increased access to and ownership of mobile phones and awareness of its services by most customers has led to increased mobile banking sign ups. Collaboration with mobile service providers in the country with most commercial banks have enabled transactions to and from bank accounts be done in customers' hands.

The findings supported Young (2006)'s study on the relationship between banking & liquidity where he concluded that mobile banking had a positive impact on liquidity of commercial banks. This explains the hypothesisthat alternative banking provide an avenue for increased financial deepening which influences the liquidity of the commercial bank.

Internet Banking and Liquidity

The coefficient of internet banking. This means that the liquidity decreases by 0.173 when the average value of internet banking transaction increases by a unit. The p value is very significant and the t value is less than 2, test of significance done at 5% level of significance. According to IFC (2014), Internet access by most of the bank customers has not been aptly adopted and thus internet banking is yet to pick up in

Kenya and Africa at large. This study's findings therefore support this assertion as most internet banking solutions do not also have the capability to accept deposits as yet. Previous studies by Young (2006) concluded that internet banking contributed negatively to commercial banks' liquidity and financial performance. This conclusion was supported by the study also done by Hassan (2012).This can be explained by the fact that very crucial variables such as technological platform, and support in internet banking may need to be enhanced to encourage further uptake of the alternate channel among customers and not corporates only.

Automatic Teller Machine Banking and Liquidity

The coefficient of ATM banking was 0.313. This means that when liquidity increase by 0.313, which shows direct relationship with mode of banking channel. The magnitude of the ATM transaction is small. This is controlled by the limits of withdrawal amount per day or specific timing however, the roll out of ATM machines that accept both deposits, withdrawals and cheque deposits had contributed to increased liquidity in commercial banks. Commercial banks have also adopted virtual teller machines which enables video transactions at the ATM. The findings in this study were in agreement with those of Ghodrati and Khan (2014) who alluded to the fact that increased ATM presences by banks would not only improve their profitability but also liquidity through more innovative ways. This study however differed with that of Abubakar et al (2015) who concluded that there was significant effect of ATM banking on commercial bank's liquidity.

Agency Banking and Liquidity

This is the coefficient of the average value of agency transactions. This means that the liquidity increases by 0.202 when the average value of agency changes by a unit. The agency banking transactions have in the past increased with adoption of this channel among many of the commercial banks. According to CBK (2017), the number of agents increased from 53,833 in 2016 to 61,290 in 2017 implying a 14% increase. This increase was bound to bring banking business closer to the customers which translated to increased commercial bank's liquidity. Banks should however take more steps in ensuring that the agents acting on their behalf are properly vetted for compliance with the CBK regulations.

The findings of the study were in agreement with those of Njogu (2014), who concluded that banks should engage more agents especially in areas where they are not able to set up physical branches as this affects their performance positively. Ogare (2013), while studying the effect of e-banking on performance of commercial banks concluded that adoption of agency banking would not only boost commercial banks' profitability but also their liquidity.

CONCLUSION

Based on the study findings, it was concluded that liquidity in commercial banks is dependent on alternate banking channels such as mobile banking, online banking, ATM banking and agency banking. Since these are the four most utilized alternate banking channels, there is need for commercial banks adequately assess the level of liquidity risks and put mechanisms that enable them monitor and regulate these types of risks to the level acceptable by the bank and the regulator, the CBK.

Even though commercial banks are operating in a digital era characterized with high uptake of alternative modes of banking by consumers that spurs banks' profitability projections, there is need for the banks to put in place mechanisms that enable them continuously monitor their liquidity resulting from more customers uptake of alternate banking channels. With increased customer numbers preferring alternate banking channels occasioned by national drive for financial inclusion, banks should develop liquidity mechanisms that rely on predictable customer behaviour. Investments in big data analytics and predictive analytical software assists

banks not only to predict customer's uptake of alternative banking channels but also enable monitoring of liquidity and liquidity resulting from such consumer behaviour. Banking systems in the digital age have been heavily customized to enable monitoring of transactional trends and allow determination, to a level of accuracy, the banking patterns associated with key accounts that have significant contributions to liquidity fluctuations. Investment in big data solutions will also enable banks to analyze and report liquidity trends to the regulator taking into consideration all transactions done in alternate channels.

From the regression analysis, all alternate banking channels were seen to be significant in determining the resultant liquidity and liquidity. Commercial banks should assess the individual contribution by both positively and negatively regressed determinants. This assessment assists banks assess adequacy of their investments in alternate banking channels and the channels contribution to overall liquidity. This will enable banks to diversify their banking portfolios and still abide by increased regulation requirements from the Central Bank.

RECOMMENDATIONS

With increased supervision and regulation, commercial banks must continuously monitor and report adequately their leverage from time to time as required under banking regulation. Policies established by commercial banks to monitor transactions from alternate banking channels and assessment of liquidity should be customized to consider individual contribution to liquidity and liquidity by the different channels. This should be aligned to all regulatory requirements from a CBK perspective. The customization of current policies will enable banks have a holistic view of cursory factors leading to the overall reported liquidity and how to manage the different channels to ensure achievement of desired objectives.

With the current changes in international financial reporting, there is need for commercial banks to review their KYC procedures more so for customers given access to alternate banking channels. Effective adoption of the improved KYC processes ensures that banks can effectively assess customers and identify the likely risk exposure the bank will suffer through engaging the customer.

Lastly, behavioural analytics is encouraged. Banks can put in place technologies that enable them assess behavioural patterns of individual customers so that whenever a customer requests for a facility from the bank, the bank relies on the behavioural patterns to make a decision to extend facilities to the customers. This enables commercial banks to effectively manage their liquidity exposures and their liquidity uptake.

Suggestions for Further Study

The current study considered only a five-year period for commercial banks and relied on secondary data from commercial banks and Central Bank of Kenya. There is need for a subsequent study to be carried out. Subsequent studies should consider longer periods to avoid challenges associated with short panels. Subsequent studies should also assess alternate mechanisms banks have put in place to manage liquidity and the contributions of these mechanisms in the overall liquidity management by commercial banks.

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