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IMPACT OF ELECTRONIC BANKING ON THE PROFITABILITY OF COMMERCIAL BANKS IN KENYA

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Abstract

Purpose: The study sought to determine the impact of electronic banking on the profitability of commercial banks in Kenya.

Methodology: The study adopted a descriptive research design. The population of the research consists of the 43 commercial banks in operations as at 31st 2014 in Kenya. A census survey was undertaken. The study used secondary data obtained from various Central Bank of Kenya publications. Statistical Package for Social Sciences (SPSS) was used in the analysis of data. Descriptive statistics produced trends, means and percentages while inferential statistics produced regression and correlation results which showed the causal relationship among the variables.

Results: Results from multiple regression indicated that there is a there a positive significant relationship between ATM transactions and bank profitability ($p<0.05$-0.004). A unit increase in ATM transactions leads to an increase in ROE (bank profitability) by 1.662 units. Further, the study found a positive significant relationship between POS transactions and bank profitability ($p<0.05$-0.021). A unit increase in POS transactions lead to an increase in ROE by 1.34 units. Trend analysis revealed that ATM transactions had a general positive trend over time. The highest volume of ATM transactions was registered in 2012. POS transactions have also steadily increased between January 2007 and June 2015. There has been an exponential positive growth in mobile transactions since the inception of M-Pesa in 2007. The average ROE of commercial bank has been relatively stable over the period covered by the study. The study used descriptive statistics was used to summarize the relationship between the independent variables and the dependent variable. Results indicated that the model of the study explained 16.9% of the dependent variable. The ANOVA tests further validated the model by indicating that it sufficiently explained the variation of profitability in commercial banks ($F=6.407$, $p=0.000$

Unique contribution to theory, practice and policy: The study recommends that commercial banks increase their ATM networks and encourage the use of payment cards at POS terminals. The study also recommends an income diversification strategy. Commercial banks should consider their charges on ATM withdrawals. Commercial banks should also consider partnering with each other so that the clients can carry out transactions at any ATM regardless of where they bank. Commercial banks should also ensure proper maintenance of ATM outlets to ensure

quality service delivery to their clients. ATM outlets should also be strategically to be accessible to as many clients possible. Commercial banks should also partner with retail outlets like supermarkets and other service providers to increase the use of banking services at point of sale terminals. Campaign ads should be undertaken by banks to inform the public on the benefits of using the cards to pay at retail outlets. It is also recommended that commercial banks inform their clients on the retail outlets at which they can use their cards to pay for goods and services.

Keywords: *e-banking, profitability, commercial banks*

1.0 Background to the Study

Electronic banking is defined by the Basel Committee (2003) as the provision of retail and small value banking products and services through electronic channels. E-banking consists of Internet banking, telephone banking, PC Banking, mobile banking, TV based banking and ATMs (Giordani, 2012). Banks which offer e-banking services are perceived as leaders in technology implementation and they would have a better brand image (Keremet al., 2003).Internet banking, telephone banking and personal computers (PC) are some of the forms of e banking. Telephone banking is delivered through call centers (Peter, 2003).PC banking involves the use of a personal computer to interact with a financial institution. Mobile banking exploits the mobile phone platform by sending short messages on transactions between the client and the bank (Chovanova, 2006). ATMs enable clients to withdraw cash, transfer money and make balance inquiries without visiting the bank (Sing & Komal, 2009).Commercial banks accept deposits (liabilities) and make loans (Saunders & Cornett, 2003).However, due to pressure of globalization and competition from nonbanking functions, commercial banks have had to find new ways to add value to their services (Ogare, 2013). For instance, internet banking was expected to result in cost reduction, performance improvement, wider coverage, revenue growth, and customer convenience (Bradley & Stewart, 2002; Chau& Lai, 2003). From thecustomer's perspective, internet banking facilitates a convenient and effective approach to manage personal finances, as it is accessible 24 hours a day and 365 days in a year without visiting the bank and from any locations (Rotchanakitumunai & Speece, 2003).Electronic banking has been significantly embraced in Kenya. Fresh data from the World Bank (2015) ranked Kenya as the most banked African country owing to the large uptake of mobile money. Mobile networks in Kenya offer m-money services in the name of M-pesa by Safaricom, Orange money by Orange, Yu-cash by Essar, and Airtel money by Airtel. Currently the mobile money market size is about 15 million users transferring Kshs. 2 billion daily, of these, over 14 million are Mpesa customers. M-money providers have partnered with commercial banks to offer mobile based financial products that aim to reach the unbanked. Other common e-banking platforms in Kenya include ATMs, smart cards and internet banking. An understanding of the implications of electronic banking has therefore become crucial.

1.1 Electronic-Banking in Commercial Banks in Kenya

The banking industry has been significantly influenced by evolution of technology (Gourlay& Pentecost, 2002). The evolution of banking technology has been mainly driven by changes in distribution channels in avenues such as over-the counter(OTC), automated-teller-machine (ATM), phone-banking, tele-banking, pc banking and internet banking (IB) (Chang, 2003).While some commercial banks have advanced in adopting e-banking, adoption of e-banking in others is

still at infancy. As at 31st December 2014, there were 2614 ATMs in Kenya (CBK, 2014) up from 2487 in December 2013. ATMs are the most common indicators of e-banking in Kenya (Mwai, 2013). However according to an annual report by Central Bank of Kenya its adoption and usage has been surpassed by mobile banking in the last few years (CBK 2008). This is following the success of Safaricom's M-Pesa. Other embodiments of e-banking among commercial banks in Kenya include mobile/SMS banking, telephone banking, electronic funds transfers, self-service (PC) banking and POS Banking (credit and debitcards) (Ogare, 2013).

While technological advancements have resulted in greater efficiency of bank operations in Kenya, investment in technology takes up large proportions of annual budgets (Aduda&Kingoo, 2012). Security concerns regarding fraud and trust are some factors that inhibit the adoption of e-banking among commercial banks in Kenya (Munyoki & Ngigi, 2012). For quality assurance, the CBK must endorse every innovative initiatives adopted by commercial banks in Kenya (Vutsengwa & Ngugi, 2013).

1.1.1 Profitability of Commercial Banks in Kenya

The main goal of a commercial bank is profitability or profit maximization in order to minimize risk exposure. The main ratios used to measure profitability include Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) (Hassan & Bashir, 2003).

Return on Equity (ROE) is a ratio between net profit and total equity measuring the profitability of the shareholders investments. This ratio depends on profit margin, financial leverage and speed assets (Bătrâncea, 2010).Return on assets measures the overall bank profitability from investment in assets. ROA indicates the efficiency of the management of the company in generating net income from all the resources of the institution (Khrawish, 2011).

1.1.2 Electronic-Banking and Profitability of Commercial Banks in Kenya

Electronic banking is not just a process innovation that allows existing banks to centralize back office operations and increase their efficiency; the existence of virtual and branch offices has important effects on the interaction between customers and the bank (Arnaboldi & Claeys, 2010).Wright (2002) mentions that Internet-banking has lifted the branch network as an entry barrier to the retail banking while introducing price transparency as customers can now easily compare prices online. Polatoglu and Ekin (2001) show that Internet-banking lowers operational costs while increasing customer satisfaction and retention.

Onay*et al*. (2008) in a study on Turkish banks concluded that e-banking has a positive impact on the profits of banks. According to their study, "Internet has changed the dimensions of competition in the retail banking sector. Lymperopoulos and Chaniotakis (2004) argue that there might be a reduction in the number of bank branches in the future due to the provision of electronic services. This translates to lower operating costs and increased profitability. However, other researchers argue that ATMs should serve to complement and not replace physical branches (Prendergast & Marr, 1994).Electronic banking has an impact on banking performance by influencing the nature of relationship between banks and their customers (Farooq, Muhammad & Ullah, 2012).

1.1.3 Commercial Banks in Kenya

Commercial banks represent a vital link in the transmission of government policies (particularly the monetary policy) to the economy (Seargent, 2001).Commercial banks in Kenya among other roles act as intermediaries between savers and borrowers, provide investment opportunities for savers and provide savers with experts in financial management (Kipngetich, 2011).Commercial banks' roles fall into four categories: mobilising savings from depositors and channeling them to productive investments; financing industry through short-term, medium-term and long-term loans; financing both internal and external trade; and financing consumer activities. Beyond the intermediation function, the financial performance of banks has critical implications for economic growth of countries (Ngure, 2014). Good financial performance rewards the shareholders for their investment. On the other hand, poor banking performance can lead to banking failure and crisis which have negative repercussions onthe economic growth (Lael*et al*., 2006).There are 43 commercial banks in Kenya (see appendix 1); 30 are locally owned while 13 are foreign owned (Central Bank of Kenya, 2011). Commercial banks in Kenya are governed by the Companies Act CAP 488, the Banking Act CAP 488and the Central bank of Kenya Act CAP 491. The Central Bank of Kenya (CBK) is the main regulatory body in the banking industry (CBK, 2011).

1.2 Research problem

Many banks both public and private sector have come forward to use internet banking and perform their main activities electronically like banking transaction such as writing checks, paying bills transferring funds, printing statements, and inquiring about account balance (Lin et *al.*, 2009). Shuqair (2003) argues that in the short run, electronic banking service will have a negative effect on the bank's profitability because of employee training costs and electronic infrastructure costs. Onay, Ozsoz and Helvacioglu (2008) found that electronic banking positively affects bank profitability. All the commercial banks highlighted in this study provide electronic banking. According to CBK (2010) more investment in electronic technology enables considerable reduction in transaction costs and therefore eliminates the need for minimum balance requirements, thereby expanding access. The qualification of the exact impact of e banking on the bank performance has proved elusive. Knowledge of the exact contribution of e banking will inform management investment decisions in technology. Various studies have been performed on the effect of e-banking on the profitability of commercial banks. De Young, Lang and Nolle (2007) analyzed the effect of e-banking on the performance of banks in the US. Their study concluded that e-banking improved the profitability of banks. Siam (2006) examined the impact of e-banking on the profitability if Jordanian banks. The study found that e-banking affected profitability negatively in the short run. Abaenewe, Ogbulu and Ndugbu (2013) investigated the effect of adoption of e banking on the profitability of Nigerian banks. They found that e-banking does not significantly improve the returns on assets (ROA).In Kenya there has been an extensive research on the area of electronic banking and profitability. Cheruiyot (2010) studied the impact of internet banking on the performance of commercial banks in Kenya. The study found there is significant association between internet banking and performance of commercial banks in Kenya. Gikandi (2009) analyzed the effectiveness of the adoption of e-banking in Kenya. The study found that e banking adoption was at its infancy in Kenya but held tremendous potential. The above studies present mixed results about the relationship between e-

banking and performance. This study found motivation in this inconclusiveness. Based on the foregoing, it is imperative to undertake a study to ascertain the impact of e-banking on the profitability of these banks. This study therefore sought to answer the question: what is the effect of e-banking on the profitability of commercial banks in Kenya?

1.3 Research objective

The objective of this study was to determine the effect of e-banking on the profitability of commercial banks listed in Kenya.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

This section reviewed the theoretical foundations that discuss and explain the effect of e banking on the performance of commercial banks in Kenya. The theories discussed are the Technology Acceptance Model, the Innovation Diffusion Theory and the theory of planned behavior.

2.1.1 Technology Acceptance Model (TAM)

The technology Acceptance Model developed in 1989 by Fred Davis. The model was originally designed to predict user‘s acceptance of Information Technology and usage in an organizational context. The model posits that that user acceptance is determined by two key beliefs, namely perceived usefulness and perceived ease of use. Perceived usefulness (U) is defined as the extent to which a person believes that using a particular technology will enhance her/his job performance, while perceived ease of use (EOU) is defined as the degree to which a person believes that using a technology will be free from effort (Davis, 1989). The theory argues that the consumers’ attitude towards using new technology is influenced by perceived usefulness and perceived ease of use. The theory uses psychometric scales to measure usefulness and ease of use. Perceived usefulness is measured on scales of whether work is done more quickly, job performance, increased productivity, effectiveness and usefulness. Perceived ease of use scales included whether the technology is easy to learn, clear and understandable, easy to become skillful easy to use, controllable and easy to remember. TAM also proposes that external factors affect intention and actual use through mediated effects on perceived usefulness andperceived ease of use. TAM has been criticized for its failure to take to account the costs involved in acquiring a new technology. The organization may b willing to adopt a new technology but may not have the necessary resources (financial or human) to do so. Despite this short coming, TAM is still one of the most useful models in explaining the adoption of technology in the organizational context. This theory informed on the process and motivation of e banking amongst commercial bank.

2.1.2 Innovation Diffusion Theory

This theory was developed by Everett Roger who argues that diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system (Ratcliff, Van Zandt &McKoon, 1999). Meso*et al.* (2006) stated that not all innovations are adopted, even if they are good, it may take a long time for an innovation to be adopted. Rogers proposes that there are four main elements which influence the spread of a new idea which are the innovation itself, communication channels, time and a social system.

According to Ratcliff et al. (1999), innovation is an idea, practice or project that is perceived as new by an individual or other unit of adoption. Rogers (2004) described the innovation-decision process as an information seeking and information processing activity where an individual is motivated to reduce the uncertainty about the advantages and disadvantages of an innovation. He explains that the innovation-decision process has five steps which include: knowledge, persuasion, decision, implementation and confirmation. Rogers (2004) described the innovation-diffusion as an uncertainty reduction process. He has also proposed attributes that can help reduce uncertainty regarding the innovation which are relative advantage, compatibility, complexity, triability and observability. Relative advantage has to do with the idea giving an organisation an edge while compatibility has to do with the degree to which the innovation is seen to be consistent with the values of the organisation and the needs of the potential adopters. Triability is the degree to which an innovation may be experimented on with a limited basis. Observability relates to the degree to which the innovation is observable by others.

2.1.3 Theory of planned Behavior

The theory of planned behavior (TPB) was developed by Ajzen in 1988. The theory posits that individual behavior is driven by behavior intentions, where behavior intentions are a function of three determinants: an individual's attitude toward behavior, subjective norms and perceived behavioral control. Attitude refers to the degree to which a person has positive or negative feelings of the behavior of interest. Behavioral intention represents a person's motivation in the sense of her or his conscious plan or decision to perform certain behavior (Conner &Armitage, 1998). Subjective norms perceived are a person's own estimate of the social pressure to perform the target behavior. Subjective norms are assumed to have two components which work in interaction: beliefs about how other people, who may be in some way important to the person, would like them to behave (normative beliefs). Perceived behavioral control is the extent to which a person feels able to enact the behavior. It has two aspects: how much a person has control over the behavior and how confident a person feels about being able to perform or not perform the behavior.

The theory of planned behavior predicts behavior, because behavior is planned. This theory has been widely applied and extended to studies on individual behavior, especially in the prediction of individual's intention to behave and the actual behavior. It is generally expected that the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual's intention to perform the behavior (Chen & Li, 2010).

2.2 Determinants of Profitability of Commercial Banks in Kenya

Most of the studies on bank profitability have categorized the determinants of profitability into internal and external factors (Rasiah, 2010; Naceur & Omran,2011; and Khrawish, 2011). Internal factors are mainly influenced by a bank's management decisions and policy objectives (Staikouras & wood, 2004), whereas external factors focus on industry- related and macroeconomic variables reflected in the economic and legal environment where banks operate (Athanasoglou*et al.*, 2006).

2.2.1 Internal factors affecting Performance of Commercial Banks

Internal factors represent aspects under the control of the bank. Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity (CAMEL) framework often used by scholars to proxy the bank specific factors (Dang, 2011).Capital adequacy refers to the amount of own funds available to support a bank business and acts as a safety net in the case of adverse selection (Munyambonera, 2012).The Bankruptcy hypothesis states that more capitalized banks will be better off because they face lower costs of funding, and because a higher ratio allows banks to absorb any shocks that they may experience (Athanasoglou, 2004). However Curak*et al.* (2012) found that more equity relative to total assets implies lower profitability, stating that banks are overly cautious. In Kenya the minimum ratio of Core Capital and Total Capital to Total Risk Weighted Assets is 8.0 percent and 12.0 percent respectively, (CBK, 2010) Given that bad assets significantly influencethe constitution and profit of banks, bank loan quality (referred to as bank asset quality) is worth being discussed. Asset quality measures the financial efficiency of the commercial banks (Pastory & Mutaju, 2013).The quality of assets is animportant parameter to gauge the strength of the bank. Asset quality points out to the proportion of nonperforming loans in the in the bank's portfolio (Chisti, 2012). Asset quality has experienced an upward trend since 2006 (Central Bank of Kenya, 2011). Management efficiency is usually qualitative and can be understood through the subjective evaluation of Management systems, organization culture and control mechanisms (Nazir, 2010). It may also be represented by financial ratios like total asset growth, loan growth rate and earnings growth rate (Ongore & Kusa, 2013).Bank expenses are also a very important determinant of profitability, closelyrelated to the notion of efficient management. Management efficiency is an indication of the management's ability to deploy the bank's resources efficiently for income maximization. Bank liquidity refers to the ability of the bank to ensure the availability of funds to meet financialcommitments or maturing obligations at a reasonable price at all times (Olagunju, Adeyanje & Olabade, 2011). Adequate liquidity enables a bank to meet three risks namely: funding risk, time risk and lending risk. Curak*et al.* (2012) found a positive relationship between increased liquidity and profitability mainly because more liquid banks were found to have more cash on hand to finance their day-to-day operations.

2.2.2 External factors affecting Performance of Commercial Banks

External factors represent forces beyond the control of the bank. External factors represent the general macroeconomic environment under which the commercial banks operate. Herrero (2003) points out that deteriorating local economic condition for instance low GDP, inflation, interest and exchange rate cause bank failure. Further, Hefferman (2005) asserts that macroeconomic factors are worsened by regulations imposed on banks. Vong and Chan (2009) states that the extent to which inflation affects bank profitability depends on whether inflation expectations are fully anticipated. An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust interest rates in order toincrease their revenues faster than their costs and thus acquire higher economic profits (Athanasoglou, 2004).

2.3 Empirical studies

Giordani (2012) examined the adoption of electronic banking (e-banking) services offered by commercial banks in Greece. The study focused on branch fees, branch dissatisfaction and

access to banks' web pages using a logit econometric model. The study found that age, gender, level of education and level of income significantly influenced the adoption of e-banking services. The study also examined the performance of Greek banks in relation to the adoption of e-banking. The study revealed that the banks experienced higher overhead expenses due to heavy investments in ITthus exhibiting lower profitability. The study also concluded that ATMs had no significant effect on bank profitability. De Young, Lang and Nolle (2007) analyzed the effect of e-banking onthe performance of banks by studying US community banks markets and compared the performance of virtual click and mortar banks with brick and mortar banks. Their study concluded that e-banking improved the profitability of banks hence increasingtheir revenues. Besides, e-banking is largely driven by the factors of minimizing the operating costs and maximizing operating profit. According to the study, Internet adoption led to increased movements of deposits from checking accounts to money market deposit accounts, increased use of brokered deposits and higher average wage rates for bank employees. Siam (2006) examined the impact of e-banking on the profitability if Jordanian banks. The study observed that majority of the banks provided services on the internet through their websites and his findings show that the attention is more to achieving e-banking than satisfying and fulfilling customers' needs. The study found that e banking has a negative effect on banks' profitability in the short run.The study concluded that there should be a well articulated strategy to achieve success and profits in the long run. Malhotra and Singh (2007) found that there is no significant relationship between the adoption of Internet and the performance of public sector banks in India in terms of Returns on Assets (ROA) and Return on Equity (ROE). They also explain that Internet banking has a negative impact on the profitability of private sector banks in terms of ROA, and a positive impact on the performance of foreign banks in terms of ROE. Abaenewe, Ogbulu and Ndugbu (2013) investigated the effect of adoption of e banking on the profitability of Nigerian banks. The study revealed that the adoption of electronic banking positively and significantlyimproved the returns on equity (ROE) of Nigerian banks. On the other hand and on the contrary,it also revealed that e-banking has not significantly improved the returns on assets (ROA) of Nigerian banks. Njuguna *et al.* (2012) investigated the factors that influence the adoption of internet banking among the individuals who have accounts with commercial banks in Nairobi County in Kenya. The study found that internet banking use in Kenya is very low. Only 24.82 percent of the respondents use Internet banking services. This is despite the high rate of internet access recorded. The study revealed that perceivedusefulness, perceived ease of use, self-efficacy, relative advantage, compatibility, and result demonstrability have a significant association with intention to use internet banking. The study recommended that, banks consider launching campaigns to demonstrate the usefulness and benefits of internet banking as a promotional and marketingmeasure. Ngugi (2013) undertook a study on the impact of online banking on financial performance of commercial banks in Kenya. This study was conducted through the use of a descriptive design. The study found a weak positive and significant relationship between online banking and the financial performance of commercial banks in Kenya. According to the study, online banking cuts banks costs, increases commission income, reduces staffing levels and makes banking more convenient for customers. The study however, recommended a review of the Fraud Legislation to curb the ever increasing bank fraud cases. Mwai (2013) sought to find out the effect of electronic banking on the financial performance of commercial banks in Kenya. The study focused on how transactional convenience, efficiency and service accessibility brought

about by electronic banking influenced the annual net profits of commercial banks. This study applied a causal-comparative research design. The study found a linear relationship between financial performance and electronic banking. According to the study, service accessibility, transactional convenience and service efficiency brought about by electronic banking increased banks financial performance. The study noted that electronic banking had revolutionized banking from depositing of money to withdrawals and checking of balances. Ogare (2013) examined the relationship between e-banking and performance of commercial banks in Kenya. The study considered the number of ATMS, number of debits and credit cards issued to customers, number of point of sales terminals and the usage levels of Mobile banking, Internet banking and Electronic funds transfer as components of e-banking. The study revealed that e-banking had a strong and significant effect on the profitability of commercial banks in the Kenyan banking industry. The study also concluded that bank innovations significantly affected bank profitability. The study recommended the government policy be reviewed to promote adoption and transfer of technology. Njiru (2014) sought to determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya. The study found out that there is a significant relationship between financial performance of the commercial banks and internet and mobile banking income. According to the study, increased development of internet and mobile banking products by the local commercial banks and the increase in the number of people using the technology resulted in increased internet and mobile banking transactions. The study recommended that banks invest heavily in technological innovations to enhance customer loyalty.

3.0 RESEARCH METHODOLOGY

The study adopted a descriptive research design. The population of the research consists of the 43commercial banks in operations as at 31st 2014 in Kenya. A census survey was undertaken. The study used secondary data obtained from various Central Bank of Kenya publications. Statistical Package for Social Sciences (SPSS) was used in the analysis of data. Descriptive statistics produced trends, means and percentages while inferential statistics produced regression and correlation results which showed the causal relationship among the variables.

4.0 RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the data findings to determine the effect e banking on the performance of commercial banks in Kenya. The study used secondary data collected from the Central Bank of Kenya reports. Pearson correlation analysis and Regression analysis was usedtodetermine the effect of electronic banking on the profitability ofcommercial banks in Kenya. The study covered a period of 9 years (34 quarters) from years January 2007 to June 2015.

4.2 Descriptive Statistics

Table 1 below presents the descriptive statistics of the dependent and independent variables. The average ROE for the period of 2007 to June 2015 was 28.15%. The average volume of ATM transactions was 501, 230, the average Point of Sale transactions were 685, 007 while the mobile transactions were 3, 6718, 862.

Table 1: Descriptives

	ATM transactions	POS transactions	Mobile transactions	ROE
Mean	510230	685007	36718862	28.15
Skewness	-0.271	0.818	0.313	0.047
Std. Error of Skewness	0.403	0.403	0.403	0.403
Kurtosis	1.357	-0.871	-1.12	-1.288
Std. Error of Kurtosis	0.788	0.788	0.788	0.788

Skewness and Kurtosis assess the normal distribution of the data. Skewness results indicate that the data is slightly positively skewed. Kurtosis results indicate ATM transactions and ROE are leptokurtic while POS transactions and mobile transactions were platykurtic. The standard error of Kurtosis and skewness were 0.403 and 0.788 respectively. The rule of thumb indicates that thestandard error of Kurtosis and skewness should be between -1.96 and + 1.96. Given that the two values fall within this limit, the data is normally distributed.

4.3 Trend analysis

Trend analysis was undertaken on all the variables. Results indicated that ATM transactions had a general positive trend over time. However a sharp dip was registered in the year 2015. A probable reason for this could be the popularity of agency banking that may serve purposes formerly offered by ATMs.

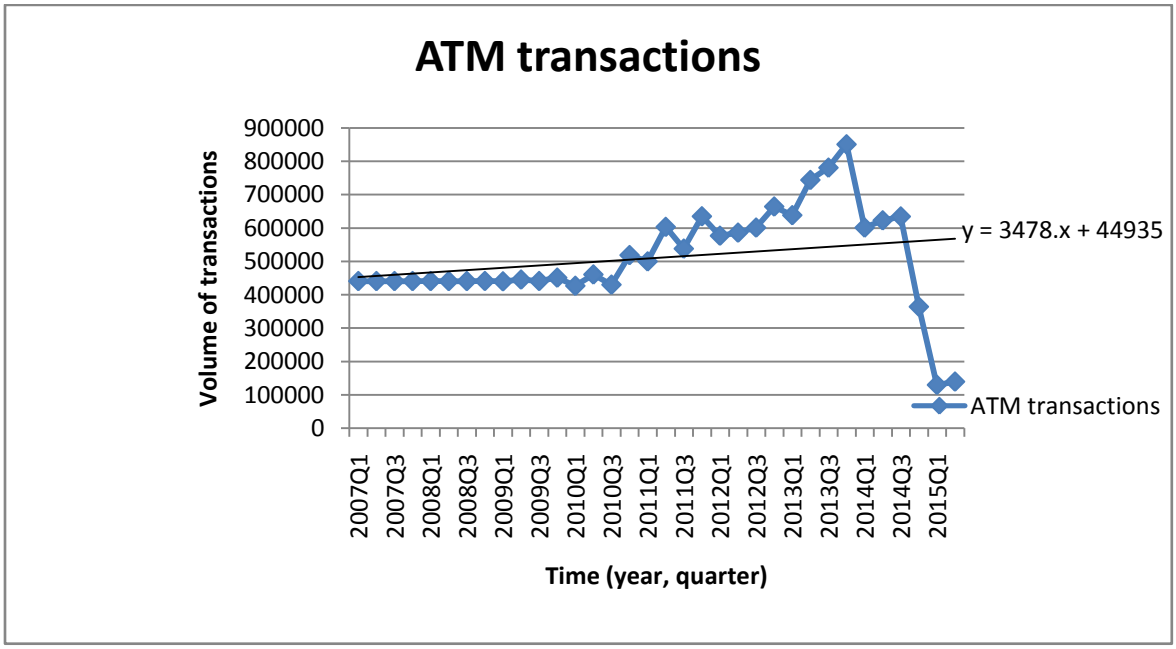

Figure 1: Volume of ATM transactions

Point of sale transactions steadily increased between January 2007 and June 2015. Between 2007 and 2009, the volume of POS transactions barely changed. A slight decrease is observed in 2010 and a steady increase thereafter. The highest volume of POS transactions was registered in 2012 after which there was a slight decrease and a rise thereafter in 2014.

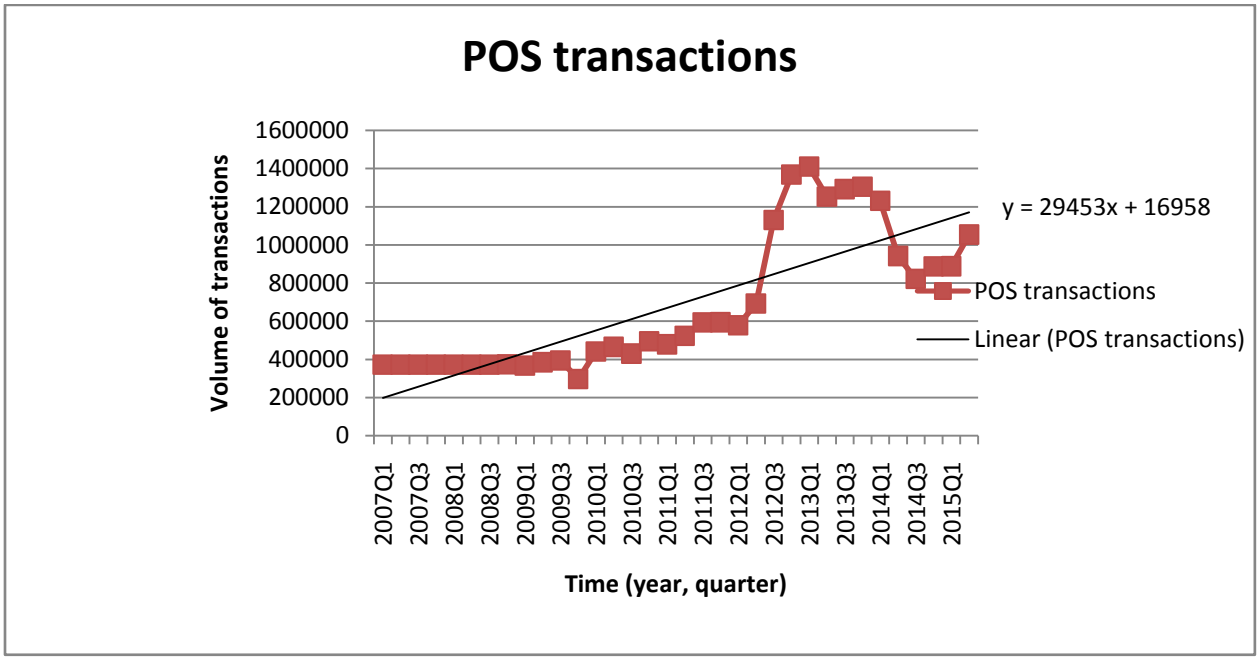

Figure 2: Volume of POS transactions

There has been an exponential positive growth in mobile transactions since the inception of M-Pesain 2007.

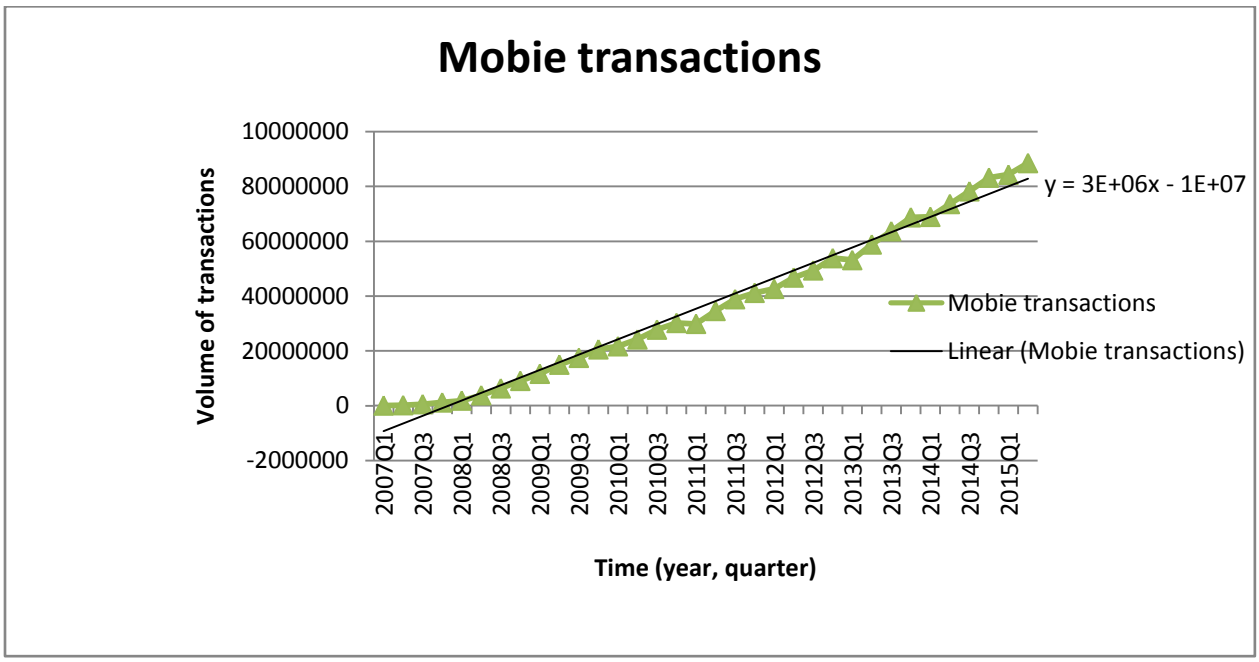

Figure 3: Volume of mobile transactions

A graphical presentation of Return on Equity over time is presented in figure 4. Results indicate the ROE of commercial banks has been fairly stable over the time under consideration in this study. A slight drop is however registered in the year 2013 followed by a slight rise in 2014.

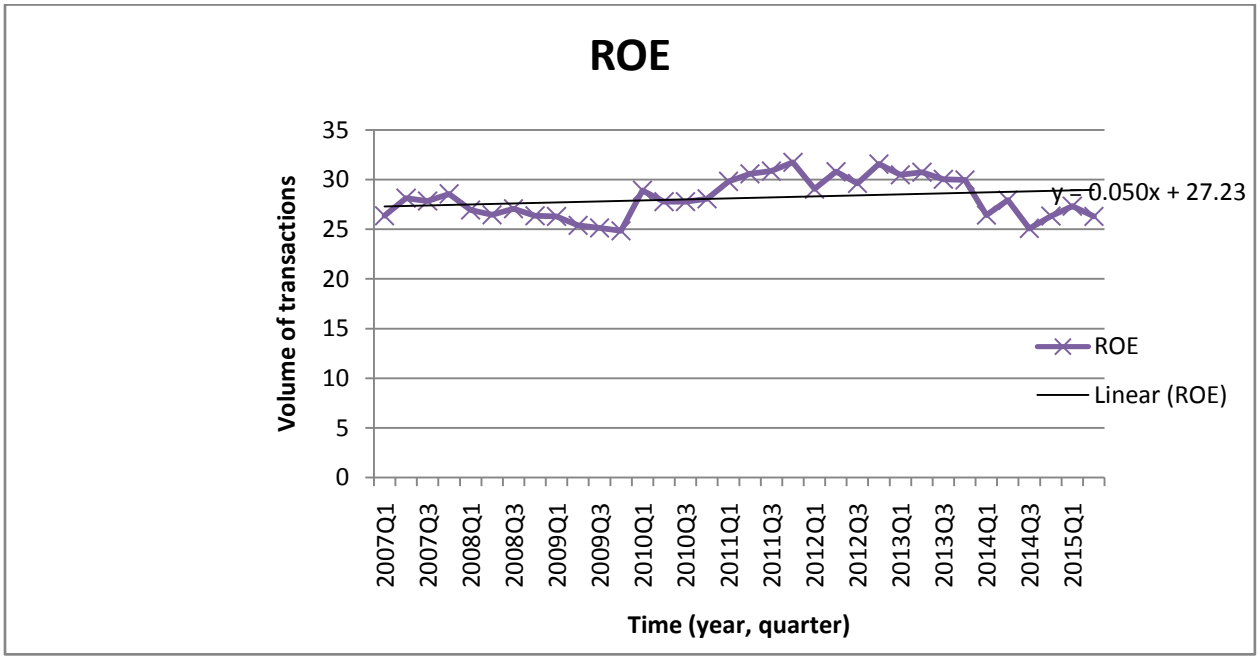

Figure 4: Trend of ROE

4.4 Correlation Analysis

Pearson's correlation was used to test for association between the variables of the study. The results were presented in table 2. Results indicate that a moderate positive significant association existed between ROE, ATM transactions and POS transactions. A positive insignificant association existed between ROE and mobile transactions. ATM transactions had a moderate positive association with POS transactions and very low positive association with mobile transactions. POS transactions were moderately and associated with mobile transactions.

Table 2: Correlation Analysis

		ATM transactions	**POS transactions**	**Mobile transactions**	**ROE**
ATM transactions	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	100			
POS transactions	Pearson Correlation	.456**	1		
	Sig. (2-tailed)	0			
	N	100	100		
Mobile transactions	Pearson Correlation	0.172	.788**	1	
	Sig. (2-tailed)	0.088	0		
	N	100	100	100	
ROE	Pearson Correlation	.379**	.266**	0.11	1
	Sig. (2-tailed)	0	0.007	0.275	
	N	100	100	100	100

4.5 Regression Analysis and Hypothesis Testing

The independent variables were transformed into natural logs for proportionality- ROE was in percentages. Table 3 illustrates the model summary used in this study and indicates the R Square value which gives the most useful measure of the success of the model, hence from the table it is evident that the model had accounted for 16.9% of the variance in Return on Equity (ROE) of commercial banks in Kenya over the period of the study. This finding implies 83.1% of commercial banks' profitability is accounted for by factors outside the model. This is expected since income from electronic banking account for only part of bank income. According to Ongore and Kusa (2013) performance of commercial banks in Kenya is driven to board and management decisions. Profitability of the bank may also be influenced by the external business environment that the commercial banks operate in as well as other bank characteristics not covered by the study.

Table 3: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.411a	0.169	0.143	2.197

Analysis of Variance (ANOVA) assesses the overall significance of the model. Table 4 below shows the model of the study sufficiently or significantly explains the variation in performance of commercial banks, $p < 0.05$, (0.000). Similar findings were registered by Aduda and Kingoo (2012) who found that e banking has strong and significance marginal effects on returns on asset in the Kenyan banking industry.

Table 4: ANOVA test

	Sum of Squares	df	Mean Square	F	Sig.
Regression	94.075	3	31.358	6.497	.000b
Residual	463.351	96	4.827		
Total	557.425	99			

A multiple regression was used to model the relationship between the independent variables and dependent variable. From the results in table a model equation is derived and presented below:

$Y= 0.044+ 0.070X_1-0.164X_2+0.018X_3$

Where

Y= Profitability of Commercial Banks (ROE)

β0= the regression co-efficient

X1= ATM transactions (log)

X2= POS transactions (log)

X3= Mobile transactions (log)

Table 5: Multiple regression

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-9.643	8.585		-1.123	0.264
Log ATM	1.662	0.56	0.282	2.967	**0.004**
Log POS	1.34	0.573	0.288	2.34	**0.021**
Log MOBILE	-0.106	0.169	-0.076	-0.628	0.531

The results in table 5 above indicate that there a positive significant relationship between ATM transactions and bank profitability ($p<0.05$-0.004). A unit increase in ATM transactions leads to an increase in ROE (bank profitability) by 1.662 units. These findings agree with those of Cook, Seiford and Zhu (2004) who found that automating bank operations significantly reduce transaction costs and improve bank performance. A positive significant relationship also exists between POS transactions and bank profitability ($p<0.05$-0.021). A unit increase in POS transactions lead to an increase in ROE by 1.34 units. However, a negative insignificant relationship exists between mobile banking transactions and bank profitability. Charges of these transactions are remitted directly to the bank as part of revenue. A probable reason is that commercial banks may not possess the competitive advantage to venture into mobile baking which is already monopolized by mobile service providers such as Safaricom Ltd. These findings are in disagreement with assertions by Mbiti and Weil (2011) that M-Pesa is complementary to banks, whereby the adoption of M-Pesa has increased the demand for banking products.

5.0 DISCUSSION CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter finalizes the study by providing the summary of key findings, conclusions and recommendations. The summary, conclusions and recommendations are aligned to the specific objectives of the study. The study sought to determine the effect of e banking on the performance of commercial banks in Kenya. The study focused on the effect of ATM Transactions, POS transactions and mobile transactions on bank performance.

5.2 Summary of Findings.

Trend analysis revealed that ATM transactions had a general positive trend over time. The highest volume of ATM transactions was registered in 2012. POS transactions have also steadily increased between January 2007 and June 2015. There has been an exponential positive growth in mobile transactions since the inception of M-Pesa in 2007. The average ROE of commercial bank has been relatively stable over the period covered by the study.

The study used descriptive statistics was used to summarize the relationship between the independent variables and the dependent variable. Results indicated that the model of the study explained 16.9% of the dependent variable. The ANOVA tests further validated the model by indicating that it sufficiently explained the variation of profitability in commercial banks (F=6.407, p=0.000). Results from multiple regression indicated that there is a there a positive significant relationship between ATM transactions and bank profitability (p<0.05-0.004). A unit increase in ATM transactions leads to an increase in ROE (bank profitability) by 1.662 units. Further, the study found a positive significant relationship between POS transactions and bank profitability (p<0.05-0.021). A unit increase in POS transactions lead to an increase in ROE by 1.34 units.

5.3 Conclusions

The study revealed that ATM transactions had a positive relationship with the performance of commercial banks. An increase in the volume transactions leads to improved bank performance.

POS transactions also positively affected bank profitability. The study concluded that e banking positively influence the profitability of commercial banks in Kenya.

The study also concluded that the main contributors of e banking are ATM transactions and POS transactions. The study arrived at the conclusion that mobile transactions do not affect performance of commercial bank

5.4 Recommendations

In line with the findings and conclusions, the study recommends that commercial banks increase their ATM networks and encourage the use of payment cards at POS terminals. Given that electronic banking accounts for only 16.9% of bank profitability, the study also recommends an income diversification strategy.

With regard to ATM transactions, commercial banks should consider their charges on ATM withdrawals. Commercial banks should also consider partnering with each other so that the clients can carry out transactions at any ATM regardless of where they bank. Commercial banks should also ensure proper maintenance of ATM outlets to ensure quality service delivery to their clients. ATM outlets should also be strategically to be accessible to as many clients possible.

Commercial banks should also partner with retail outlets like supermarkets and other service providers to increase the use of banking services at point of sale terminals. Campaign ads should be undertaken by banks to inform the public on the benefits of using the cards to pay at retail outlets. It is also recommended that commercial banks inform their clients on the retail outlets at which they can use their cards to pay for goods and services.

5.5 Areas for Further Study

The study suggests that further studies should include a qualitative analysis of the relationship between e banking and financial performance of banks. Such a study would involve interview of key informants in the banking sector and would provide hidden insights into the intricate relationship between e banking and financial performance of banks. Perhaps such a study could capture the perception of the public regarding e banking.

Further areas of study should be focus on a longer time span, probably 20 to 30 years. This would clarify whether the observed relationship changes over the years. Such a study would call for advanced econometric and statistical analysis such as time series and panel data analysis.

Future studies should explore all possible avenues of e banking to improve the explanatory power of the model e banking to financial performance of commercial banks. Such factors could include electronic fund transfers, debit and credit cards

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