

The Relationship between Mobile Banking Deepening and Financial Performance of Commercial Banks in Kenya

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Abstract

The objective of this study was to investigate the relationship between mobile banking deepening and financial performance of commercial bank in Kenya. The banking sector in Kenya has experienced turbulent times following the collapse of many banks in the 1990s. In order to minimize their operational costs, commercial banks have adopted internet banking including ATMs, mobile banking and internet banking where customer can access their accounts on their personal computers. Mobile banking offers millions of people a potential solution in emerging markets that have access to a cell phone, yet remain excluded from the financial mainstream. The study applied descriptive research design. The target population included six mobile phone service providers who provide mobile phone services and 43 commercial banks operating in Kenya as at June 2014. The total amounts transferred via the mobile for the past five years were collected and the number of mobile banking users was regressed against bank performance as measured by the return on assets. The study used secondary data from the Central bank of Kenya, Mobile phone Companies and Kenya National Bureau of Statistics. During the study period, the amount of money transacted through the mobile money transfers increased steadily from 27.07 billion in 2009 to 207.08 billion by the last month of the analysis. The growth was motivated by the convenience offered by the service. The study however found that there exist a weak positive relationship between mobile banking and the financial performance of commercial banks in Kenya. The study recommends that the policy makers take mobile banking awareness creation into consideration when drafting policies on the operations of banks in Kenya. This was because of the weak relationship of mobile banking and financial performance especially as the industry moves into a technologically competitive environment. The study also recommends that policy makers keep a keen eye on the developments of mobile banking as it is a new platform for competition among commercial banks as the world moves into a digital age to ensure it does not lose its regulatory role.

Keywords: Mobile Banking Deepening, Financial Performance, Commercial Banks

1. Introduction

1.1 Background of the Study

Mobile banking is a system that allows customers of a financial institution to conduct a number of financial transactions through a mobile device such as a mobile phone or tablet (Darrat, 1999). While mobile banking deepening the increased provision of financial services with a wider choice of services geared to all levels of society (Vaidya 2011). Mobile banking differs from mobile payments, which involve the use of a mobile device to pay for goods or services either at the point of sale or remotely, analogously to the use of a debit or credit card to effect an Electronic Funds Transfer at Point of Sale (EFTPOS) payment (Darrat, 1999).

The term financial performance is used as a general measure of a firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation (Bernardin and Russel, 2009). There are many different ways to measure financial performance, but all measures should be taken in aggregation. Line items such as revenue from operations, operating income or cash flow from operations can be used, as well as total unit sales. Furthermore, the analyst or investor may wish to look deeper into financial statements and seek out margin growth rates or any declining debt (Banking Review issue no.010, June 2009).

Over three billion people in developing countries are still without effective access to financial services. The problem is particularly acute in Sub-Saharan Africa, where only between five and twenty-five percent of households have a formal relationship with a financial institution. Lack of access to financial services is therefore one of the largest constraints to private sector development in Africa. In responding to these changes, the Kenyan market in has recently witnessed a host of changes in the financial sector as a result of changes in the legal, regulatory, institutional framework. Fast changing technology has also greatly influenced access to financial services and increased channels through which financial services are provided. The objective of the research was to examine empirically the link between mobile banking deepening and financial performance of commercial bank in Kenya, the extent to which changes in regulation and increasing rollout of new products such as mobile money payment systems, mobile banking and agency banking affect access to financial services to the Kenyan population.

Mobile banking (m-banking) refers to provision and availment of banking and financial services

through the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, administer accounts and to access customized information. Mobile banking is an innovation that has progressively rendered itself in pervasive ways cutting across several financial institutions and other sectors of the economy. During the 21st century mobile banking advanced from providing mere text messaging services to that of pseudo internet banking where customers could not only view their balances and set up multiple types of alerts but also transact activities such as fund transfers, redeem loyalty coupons, deposit cheques via the mobile phone and instruct payroll based transactions (Vaidya 2011). The world has also become increasingly addicted to doing business in the cyber space, across the internet and World Wide Web.

Financial deepening is a multi-faceted process that involves the interaction of a number of markets (primary, secondary and retail), instruments (deposits, loans, foreign exchange, bonds and debt securities) and stakeholders (banks, contractual savings institutions, companies). It can be defined as a process in which institutions and financial markets: facilitate goods and services exchange (e.g. payment services), mobilize and pool savings of a large number of investors acquire and process information about the companies and the potential investment projects and therefore allocating public savings to the most productive uses, follow investments and exert corporate governance, and diversify and reduce liquidity risk and inter-temporal risk (Levine, 2005; King and Levine, 1993). In other words, financial deepening can be understood as a process by which the range of products and players widens, deadlines extend and services play a role in risk coverage and diversification.

Financial deepening is the increased provision of financial services, and access to basic financial services such as credit, savings and insurance. It is the increase in the size of the financial system and in its role of financing with a wider choice of service geared to the development of all levels of society. Financial inclusion offers incremental and complementary solutions to tackle poverty, to promote inclusive development Chibba, (2009). It aims at drawing the unbanked population in to the formal financial system so that they have the opportunity to access financial services ranging from savings, payments and transfers to credit and insurance. Financial deepening plays an important role in reducing risk and vulnerability for disadvantaged groups, and increasing the ability of individuals and households to access basic services like health and education, thus having a more direct impact on poverty reduction (Lavine, 1997). 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 such as Equity Bank, I&M Bank, and Kenya Commercial Bank, Barclays and Co-operative to offer mobile based financial products that aim to reach the unbanked.

The provision of wider scope of financial services through mobile banking services has become most interesting frontiers in finance and business today. This is because they give opportunities to reduce poverty levels in rural areas and empower rural poor people economically by taking mobile -technology based financial services to the rural areas where there are no banks. The reason for limited financial deepening in Kenya is that financial services were being offered only by banks which concentrated in urban areas excluding the rural people due to their poverty and poor infrastructure in those areas.

The Kenya Financial Sector Deepening (FSD) programme was established in early 2005 to support the development of financial markets in Kenya as a means to stimulate wealth creation and reduce poverty. Working in partnership with the financial services industry, the programme's goal is to expand access to financial services among lower income households and smaller enterprises. It operates as an independent trust under the supervision of professional trustees, KPMG Kenya, with policy guidance from a Programme Investment Committee (PIC). The conceptual underpinning of FSD's work derives from the making markets work for the poor approach, which has emerged over the last ten years as an increasingly influential development paradigm. It provided the original impetus for the establishment of FSD Kenya and has guided its activities over the last six years. M4P has been defined as "an approach to developing market systems that benefit poor people, offering them the capacities and opportunities to enhance their lives. FSD's primary focus is developing the capacity of the financial services industry, working directly with a diverse range of financial institutions, business service providers and support institutions (Khrawish, 2011). In doing so, we aim to complement other initiatives - such as reforms of the enabling environment and wholesale lending or investments programmes supporting emergent MFIs.

A subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. Ultimately the universal measure of business performance is money and the ultimate forms of this measurement are the final accounts of the company. Money has the advantage that it can be used to measure the effectiveness and efficiency not only of different business functions (marketing, engineering, production et) but also of different businesses.

Profit is the ultimate goal of commercial banks. All the strategies designed and activities Performed

thereof are meant to realize this grand objective. However, this does not mean that Commercial Banks have no other goals. Commercial banks could also have additional social and economic goals. However, the intention of this study is related to the first objective, profitability. To measure the profitability of commercial banks there are variety of ratios used of which Return on Asset, Return on Equity and Net Interest Margin are the major ones (Murthy and Sree, 2003; Alexandru et al., 2008). ROE is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is the ratio of Net Income after Taxes divided by Total Equity Capital. ROA is also another major ratio that indicates the profitability of a bank. It is a ratio of Income to its total asset (Khrawish, 2011). It measures the ability of the bank management to generate income by utilizing company assets at their disposal.

Indeed, the economic growth and development of a country depends greatly on this role, the role of financial deepening. In Kenya, recently there have been efforts to enhance financial sector deepening; commercial banks have demonstrated that it is possible to reach millions of low-income clients with affordable transaction accounts. Competition from Safaricom's M-Pesa mobile money service, for instance has pushed other banks further down market where they are exploring innovative agency banking. Despite the quick success of M-Pesa, building the platform's now 27,000-agent network involved huge up-front costs.

The view that financial deepening is a necessary pre-condition for economic growth rests on many premises (Darrat, 1999). This hypothesis contends that well-functioning financial institutions can promote overall economic efficiency, create and expand liquidity, mobilize savings, enhance capital accumulation, transfer resources from traditional sectors to the more modern growth inducing sectors and also promote a competent entrepreneur response in these modern sectors of the economy. This hypothesis is usually labeled "supply leading" since it postulates that the presence of efficient financial markets increases the supply of financial services in advance of the demand for them in the real sector of the economy. Ngugi, Amanja and Maana (2009), argue that when the financial system has achieved depth then availability of and access to financial services is possible to achieve. The size and depth is viewed as important in determining saving and investment behaviour. Furthermore, access and size and depth has significant implications on the real activity, economic growth and welfare.

Financial liberalization has promoted deeper financial markets in SSA countries. In almost all the specifications, and after controlling for macroeconomic factors, the coefficient of the financial liberalization index is positive and significant. In countries with similar financial liberalization efforts, those with better legal institutions have on average outperformed the others. They have achieved this by reducing information asymmetries, by honoring the rule of law, and by having relatively more efficient judicial systems. The legal variables coefficients are significant and hold the expected sign. Countries whose legal systems are inspired by French institutions seem to have been less successful on average in promoting financial development. For the macroeconomic variables the coefficients for inflation are in most regressions negative and significant, suggesting that the sustained reduction in inflation achieved in most SSA countries over the last two decades has helped to promote credit to the private sector. As suggested by the excess liquidity observed in SSA banks, fiscal deficits do not seem to have been an obstacle to financial deepening in the recent past.

The banking industry in Kenya is governed by the companies Act, the Banking Act, the Central Bank of Kenya Act and various prudential guidelines issued by the Central Bank of Kenya (CBK). The banking sector was liberalised in 1995 and exchange controls were lifted. The CBK, which falls under the Ministry of Finance, is responsible for formulating and implementing monetary policy and fostering the liquidity, solvency and proper functioning of the financial system.

At the end of June 2003, the banking system comprised 43 commercial banks, 2 non-bank financial institutions (NBFIs), 2 mortgage finance companies and 4 building societies. Banking and non-bank financial institutions declined to 51 in June 2003 from 55 in June 2002 due to the merging of six institutions into three and the liquidation of another. However, the sector remained highly concentrated with 9 of the 43 banks controlling 74% of total assets in the sector.

A number of banks closed some branches as part of their cost and business rationalization and restructuring measures. As a result, the branch network of commercial banks declined to 488 at the end of June 2003 from 497 in June 2002. Foreign exchange bureaux stood at 47 in June 2003 from 48 at the end of June 2002 following the closure of one up-country foreign exchange bureau (CBK, 2003). Central Bank issued revised Prudential Guidelines and Risk Management Guidelines aimed at enhancing corporate governance, provisioning levels and risk management in the sector. As at 30th June 2010, the Kenyan banking sector comprised 43 commercial banks, one mortgage finance company and 127 foreign exchange bureaux. The sector's total profitability in the same period was Kshs. 34.9 billion. The growth in the sector is attributed to the increased uptake of loans and other bank products and services by Kenyans.

Some Kenyan banks are exploiting business opportunities in the regional markets thanks to liberalisation. The banking sector, over the years, has witnessed stiff competition due to the homogeneity of the products and services offered by the banks forcing them to re-package financial services and products to satisfy

the needs of the customers and retain market share. Institutions therefore increasingly started offering e-banking services for both residents and nonresidents. Islamic banking emerged as a new market product. In response to this, some of the institutions redefined their commercial banks strategies while leveraging on innovative and affordable products to capture this new market segment.

1.2 Research Problem

Theoretically, the seminal contributions of McKinnon (1973) and Shaw (1973) postulate that government intervention in the pricing and allocation of loanable funds impedes financial deepening mainly by depressing real interest rates. The former argued that credit market structure (official and unofficial credit markets) influences the way in which banking policies affect financial deepening while the latter thought that imperfect information between lenders and borrowers increases adverse selection and moral hazard problems in credit markets. The effects of banking sector controls on the process of financial deepening still remain ambiguous at the empirical level as indicated by Arestis et al. (2002).

Mobile money has emerged as a strong competitor to financial institutions in Kenya. Initially cellular phones were developed to improve communication from the earlier fixed forms of communications such as landline, faxes and telegrams. Financial institutions introduced ICT as an improvement to the banking channels. In this regard mobile phone service providers have taken mobile money services deeper into the financial sector by offering a range of financial services through their networks. The current mobile banking using mobile money services like M-PESA, Zap and Yucash have been established to cater for money transfer needs and demand by urban dwellers to their families in living in remote rural areas where there are no banks.

A developed financial system broadens access to funds, conversely, in an undeveloped financial system, access to funds is limited and people are constrained by the availability of their own funds and have to resort to high cost informal sources such as money lenders. One of the key features of financial deepening from the literature is that it accelerates economic growth through the expansion of access to those who do not have finance themselves. It is this availability of external finance to budding entrepreneurs and small firms that enable new entry, while also providing competition to incumbents and consequently encourage entrepreneurship and productivity. Financial deepening helps to alleviate SMEs financing constraints, enabling new entry and resource allocation. Despite various studies on the causal relationship between finance and growth little research has been done on the relationship between financial deepening and growth of SMEs. Many of previous studies on this subject suffer from limitation of relying on cross-sectional data which cannot satisfactorily address the country specific issues. The problem of using a cross-sectional method is that grouping together countries that are at different stages of financial development and growth fails to address the country specific effect of financial development.

Kenya has so far three Mobile Money Service Providers which provide Mobile Network services. These are Safaricom's M-PESA services, ZAP of Zain and yu-cash provided by Yu. This study investigated the mobile banking services being used by the un-banked low income individuals and institutions in Kenya. It also draws up from literature review, the specific issues and challenges encountered when applying traditional financial services techniques by the mobile money service providers.

2. Literature Review

This section discusses the following: Section 2.2 discusses the theoretical literature related to the research topic i.e. the technology acceptance model, theory of diffusion of innovations, theory of financial deepening and financial liberalization theory. Section 2.3 reviews determinant of financial performance 2.4 reviews the empirical literature on International evidence on financial deepening and local evidence on deepening and commercial banks performance and section 2.5 is the summary of literature review.

2.2 Theoretical Literature Review

The study looks at four theories which include financial liberalization theory, Neo-classical growth model, Endogenous growth theory and the Growth theory of cumulative causation. Key among this is financial liberalization theory which looks at how a liberalized financial system can positively affect economic growth.

2.2.1 The Technology Acceptance Model

TAM is a theoretical model that evaluates the effects of things like system characteristics on user acceptance (Davis, 1986). TAM assumes that a computer user generally acts quite rationally and uses information in a systematic manner to decide whether to adopt, or not to use this technology in the workplace. Davis (1986) identified three major determinants of technology acceptance that relate to cognition and effectiveness and were suggested by previous research studies. He began with the TRA and adapted this as a basis for causal links between perceived usefulness, perceived ease of use, attitude towards using technology and behavioural intention to explain technology adoption.

Relative advantage refers to the degree to which an innovation is perceived as providing more benefits

than its predecessor (More & Benbasat 1991). Relative advantage results in increased efficiency, economic benefits and enhanced status (Rogers 2003). Past research has found that relative advantage of an innovation is positively related to the rate of adoption (Moore & Benbasat 1991). Research suggests that when user perceives relative advantage or usefulness of a new technology over an old one, they tend to adopt it. In the context of banking sector, benefits such as immediacy, convenience and affordability to customers have been reported (Lin 2011).

2.2.2 Theory of Diffusion of Innovations

The theory of Diffusion of Innovations as described by Rogers (1995) is well known. Rogers describes diffusion of innovations as: “the process by which an innovation is communicated through certain channels over time among the members of social systems. It is a special type of communication, in that the messages are concerned with new ideas” (Rogers, 1995). Technology diffusion is an indispensable process through which technological potential of innovative activities can be actually turned into productivity. Various characteristics of the economic environment in which diffusion takes place may affect the pace of diffusion, while the diffusion itself may also have feedbacks on the environment. A decision not to adopt an innovation relates to the rejection of the available new idea. However, in order to explain the rate of adoption of innovations Rogers suggests measurement of the following perceived characteristics of innovations: relative advantage compatibility; complexity; reliability; and observability. Rogers (1995) postulated that the adoption of innovations is influenced by these five characteristics, and that they can explain the rate of technology adoption.

Cheung et al. (2000) defined complexity as the extent to which an innovation can be considered relatively difficult to understand and use. They found that complexity negatively influences the adoption of internet usage. Complexity is the opposite of ease of use. Ease of use refers to the extent to which mobile banking is perceived as easy to understand and operate. Lin, (2011) suggests that there is a strong impact of perceived ease of use of new technology on its adoption. As banking services have very user friendly interfaces, users see them as easy to use, and hence to form positive attitudes towards them (Lin 2011).

Observability of an innovation describes the extent to which an innovation is visible to the members of a social system, and the benefits can be easily observed and communicated (Rogers, 2003). Moore & Benbasat, (1991) simplified the original construct by redefining observability into two constructs: visibility and result demonstrability. In the context of banking, observability is defined as the ability to access the banking services at any time and from any location without any delay or queue, and seeing the effect of banking transactions immediately, and conveying the accessibility benefits to others.

2.2.3 Theory of Financial Deepening

The argument that advocates that financial sector liberalization leads to financial development and eventually to economic growth is based on the theoretical framework and analytical underpinning by McKinnon (1973) and Shaw (1973). The concept of financial deepening is usually employed to explain a state of an atomized financial system, that is, a financial system which is largely free from financial repression (Nnanna and Dogo, (1998). Financial deepening results from the adoption of appropriate real finance policy, namely relating real rates of returns to real stock of finance. Conversely shallow financial system is partly the consequence distortions in the relative process of finance. Financial intermediation of growth allows for financial deepening. Shaw (1973) contends that an increase in the real size of the monetary system will generate opportunities for the profitable operations of other institutions as well, from bill dealers to industrial banks and insurance companies. In its own right, financial depth contributes to growth by improving the productivity of investment. This linkage corroborates further the positive role played by financial liberalization on growth Friedman (1998).

It is well established that a vibrant, dynamic, and well-functioning financial sector leads to a host of improved economic outcomes, as surveyed first by Levine (1997a), then by Demirguc Kunt and Levine (2008 and 2009), there is a vast literature showing the benefits that accrue to countries in which financial development is greater. On the theoretical side, early work by McKinnon (1973) and Goldsmith (1969), among others, highlighted the key role in economic development that could be played by a banking system free of the types of controls on interest rates and quantities that were prevalent at the time. As the literature progressed, it began to recognize that the financial system in general not exclusively banks performed four basic functions essential to economic development and growth: mobilization of savings, allocation of resources to productive uses, facilitating transactions and risk management, and exerting corporate control. Through these functions, a country providing an environment conducive to greater financial development would have higher growth rates, with much of the effect coming through greater productivity rather than a higher overall rate of investment.

2.2.4 Financial Liberalization Theory

In financial liberalization theory, as advanced by McKinnon, (1973) and Shaw, (1973), financial repression, that is distortions of financial prices such as interest rates, reduces the real size of the financial system relative to the non-financial, which leads to slow real rate of economic growth. The theory rests on the assumptions that saving is an increasing function of real rate of interest on deposits and real rate of growth in output and that investment is a decreasing function of the real loan rate of interest and an increasing function of the growth rate.

According to this theory, in an environment where investment opportunities are plentiful but the financial system is repressed, the key to higher and more efficient investment is to raise the return to savers that is the real interest rate. The theory concluded that alleviating financial restrictions in developing countries (mainly by allowing market forces to determine real interest rates) can exert a positive effect on growth rates as interest rates rise toward their competitive market equilibrium. According to this tradition, artificial ceilings on interest rates reduce savings, capital accumulation, and discourage the efficient allocation of resources. Additionally, McKinnon pointed out that Financial Repression can lead to dualism in which firms that have access to subsidized funding will tend to choose relatively capital-intensive technologies; whereas those not favored by policy will only be able to implement high-yield projects with short maturity.

2.3 Determinant of Financial Performance

This is a measure of how well a firm can use assets from its primary mode of business and generate revenues. This term is also used as a general measure of a firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation (Bernardin and Russel, 2009). There are many different ways to measure financial performance, but all measures should be taken in aggregation. Line items such as revenue from operations, operating income or cash flow from operations can be used, as well as total unit sales. Furthermore, the analyst or investor may wish to look deeper into financial statements and analyses margin growth rates or any declining debt. Ultimately the universal measure of business performance is profits and the ultimate forms of this measurement are the final accounts of the company. Profits have the advantage that it can be used to measure the effectiveness and efficiency not only of different business functions (marketing, engineering, production) but also compare different businesses or firms.

Financial performance is positively related with size of company. Arguments were floated by Hardwick, (1997) that there is a positive relationship between performance and company size due to operating cost efficiencies through increasing output and economizing on unit of cost. Large corporate size also enables investors to effectively diversify their assumed risks and respond more quickly to changes in market conditions. Large firms as Bain, (1968) and Scherer, (1980) argued possess monopoly power which allows them to set prices above the economic costs involved in the production of the products resulting in additional profit for the larger firms. In terms of investment performance, Adams, (1996) believes that large companies are able to diversify their investment portfolios and this could reduce their business risks. Observations by Grace & Timme, (1992) that large companies generally outperform smaller ones because they manage to utilize economies of scale and have the resources to attract and retain managerial talent.

Liquidity as studies done by Shiu, (2004) proves that companies with more liquid assets are likely to perform better as they are able to realize cash at any point of time to meet its obligation and are less exposed to liquidity risks. By not having sufficient cash or liquid assets, companies may be forced to sell investment securities at a substantial loss in order to settle claims promptly. This in effect will affect their financial performance.

Solvency margin of a firm similarly is a determinant of financial performance as it acts as a cushion to absorb the risk of conducting businesses. The capital or surplus is measured as the excess of assets over obligations. Companies with higher solvency margin are considered to be more financially sound as it has more surpluses to cater for any unexpected losses.

Although the Mobile banking money transfer models are providing financial services deep into rural areas where there are no banks, there is possibility that these models are insufficient when it comes to providing wider scope of financial needs of these people and subscribers are looking for more products, better service and better prices. More to this many of the targeted people in rural areas have no idea or little knowledge on both finance and information technology which could be limiting full exploitation of financial services being offered by ever changing mobile phone technology.

2.4 Empirical Literature Review

Empirically, Tufano (1989) showed that of all public offerings in 1987, 18% (on a dollar-weighted basis) consisted of securities that had not been in existence in 1974. These innovations are not just critical for commercial banks in the financial services industry, but also impact other companies: for instance, enabling them to raise capital in larger amounts and at a lower cost than they could otherwise. Financial innovation, like other economic behaviors, generally arises in anticipation of material gains following a cost-benefit analysis. The innovation makes possible either a reduction in costs or an increase in revenues, or both. On the cost-reducing side, in particular, exogenous technological change provides room for cost reduction that induces innovation. For example, advances in information technology have significantly lowered the cost of accounting-intensive products such as mutual funds (Frame and white, 2004).

A study done by Oya and Damar (2006), on financial sector deepening and economic growth: evidence

from turkey. The size of the financial sector, or financial depth can be defined as commercial bank deposits divided by GDP. Such a definition of financial intermediary development is very much in line with the traditional view that the financial sector can contribute to economic activity by mobilizing savings and channeling them towards productive capital investment. However, the traditional view implicitly assumes reasonably well functioning financial intermediaries. The very limited amount of available evidence suggests that the link between financial development and economic growth may be different under adverse financial sector conditions compared to a case of well-functioning financial intermediaries.

Recent work on causality issue by Rajan and Zingales (1998), took a different approach, focusing on a more disaggregated relationship between finance and growth. They stressed that financial development reduces the costs of external finance to firms and promotes their growth. Assumption is that different industries have their own efficient demand for external finance (investment minus internal cash flow) and that the distribution of the need for external finance by industry is very comparable across countries. In this setting, an industry with more demand for external finance should grow faster in countries with more developed financial markets. They used the US as a benchmark country with relatively frictionless financial markets, and found that industries more dependent on external finance grow faster in countries with more developed banks (as measured by PRIVY) or stock markets (stock market capitalization).

Some favorable evidence for the existence of a positive causal link between banking deregulation and growth has been provided by Jayaratne and Strahan (1996). They analyze the effect that the relaxation of bank branch restrictions in the United States may have had on growth at the state level. Their results point to a positive growth effect resulting from intrastate branch reform through the transmission channel of greater quality of bank lending.

The seminal empirical work that established the growth-finance link by King and Levine (1993), introduced four measures for the development level of financial intermediaries, which may measure the functioning of the financial system more precisely, averaged over the period 1960-1989. These measures included; Depth that is the liquid liabilities of the financial system [(currency plus demand and interest bearing liabilities of banks and nonbanks)/GDP]; Bank which is the importance of the role of banks (relative to the central bank) for allocating credit, (bank credit / (bank credit + central bank domestic assets); Private ratio of credit allocation to private business to total domestic credit (excluding credit to banks); Privy ratio of credit to private business to GDP. They also employed three growth indicators averaged over the same period: real per capita GDP growth (economic growth); real per capita capital growth (capital accumulation); and TFP growth (productivity growth). They ran 12 regressions on a cross-section of 77 countries, controlling for other variables associated with economic growth like income per capita, education, political stability, and indicators of exchange rates, trade, fiscal and monetary policy. They found statistically and economically significant coefficients of financial development in all 12 regressions and confirmed a very strong relationship between each of the four financial development indicators and each of the three growth variables.

Therefore, financial development can have a large impact on growth rate. In order to investigate whether growth results from financial development, they also considered how well the degree of financial depth in 1960 is correlated with the three growth indicators averaged over 1960 -1989. Their regressions suggested that the initial level of financial development could predict well the subsequent rates of economic growth, capital accumulation and productivity growth, even after controlling for important core factors of economic growth.

A study done by Ndi (2013) to establish the effect of mobile phone technology innovations on financial deepening within the banking industry in Kenya. The study adopted a survey research design since it focused on commercial banks in Kenya. It made use of secondary data that was partly collected from the published financial statements of commercial banks in Kenya while the rest of the data was obtained from various departments of the said commercial banks. The researcher managed to collect data from 35 commercial banks in Kenya. Regression analysis was used to establish the effect of mobile phone technology innovations on financial deepening within the banking industry in Kenya. The study revealed that mobile phone technology innovation explains some variance in the financial deepening of the banking industry in Kenya. However the variance explained is not higher than the unexplained percentage since there are other variables that explain a greater percentage of financial deepening in the banking industry. As such, the results of the model indicate that none of the variables is significantly related to the dependent variable.

Ongore and Kusa (2013) conducted a study to establish the determinants of financial performance of commercial banks in Kenya. The study mainly focused on the effect of bank ownership structure on the financial performance of commercial banks in Kenya. It was evident from the findings of the study that bank specific factors significantly affect the performance of commercial banks in Kenya, except for liquidity variable. The study also revealed that the overall effect of macroeconomic variables did not have a significant impact on the financial performance of commercial banks in Kenya since it has a significance level of 5%. It was also clear from the finding that the moderating role of ownership identity on the financial performance of commercial banks was insignificant to the financial performance of commercial banks in Kenya. The study therefore

concluded that the financial performance of commercial banks in Kenya is driven mainly by board and management decisions, while macroeconomic factors have insignificant contribution.

Kihumba (2008), analyzed the reason for innovation and financial performance of 43 banks between 2000 and 2007, how each factor caused innovation in the Kenyan market and how innovation has increased annual revenue, business volume, customers' turnover and reduced costs of operation, facilitated expansion of market share and geographical coverage of the bank. He found that, some financial institutions do innovate to utilize their excess capacity and to maximize their revenues within existing capacity.

In conclusion, the existing literature has shown that exogenous technological advances, weak institutions and financial instability contribute to shallowness of financial systems. However, proponents of the financial performance of commercial banks have argued that enabling mobile banking deepening could increase vulnerability of the banking system to outside shocks by creating mismatches on balance sheets. In either case, technological advancement should have an effect on financial deepening of an economy. Empirically there have been limited studies that investigate the link between the two: mobile banking and financial performance and their effect on financial deepening. The aim in this paper has been to contribute to the literature in that regard.

3. Research Methodology

This section highlights the methods and procedures used in carrying out the study. It includes the following; section 3.2 presents survey research design; section 3.3 presents the population; section 3.4 presents data collection; section 3.5 presents data analysis, Conceptual and analytical model as well as data presentation methods.

3.2 Research Design

This study took on a descriptive survey research design. A descriptive survey attempts to describe or define a subject often by creating a profile of a group of problems, people or events through the collection of data and tabulation of the frequencies on research variables or their interaction as indicated by Cooper and schindler (2006). This was a descriptive study where the researchers gathered data from the published to investigate the relationship between mobile banking deepening and financial performance of commercial bank in Kenya.

The study employed both quantitative method through analysis of the financial statements using various models and ratios to provide predominantly quantitative and qualitative data to the study. The qualitative data was used to shed some light on the quantitative data to enable for a more in-depth analysis of the research problem.

The study employed both quantitative method through analysis of the financial statements using various models and ratios to provide predominantly quantitative data to the study. Quantitative data enabled for a more in-depth analysis of the research problem.

3.3 Population

The target population in a research study is the total number of individuals in a group or the number of groups that the researchers are intending to work with (Cooper and Schindler 2001). Cooper and Schindler (2001) terms the population as the total collection of the elements about which the researchers are intending to make their inferences from.

The population of the study in this research included all the commercial banking institutions operating in Kenya. Central Bank of Kenya (2014) indicates that there are 43 licensed and operational commercial banks as at December 2013. The 43 banks therefore forms the target population of the study.

3.4 Data Collection

The study made use of secondary data on the deposits and other transactions of the banking industry for the last five years from 2009 to 2013. The data collected specifically related to number of customers registered in the mobile banking networks of the commercial banks; the volume of transactions the commercial banks handle based on mobile phone banking technology and the deposits mobilized through mobile banking. The researcher relied on several sources for the data; audited and published financial statements of the target banks, the Central Bank of Kenya, the Kenya National Bureau of Statistics and some directly from the banks.

3.5 Data Analysis

Data analysis involved organizing, accounting for and explaining the data; that is, making sense of the data in terms of respondents' definition of the situation noting patterns, themes, categories and regularities (Mugenda and Mugenda, 2003). After the data has been analyzed, a cross examination was done to ensure the trend and patterns of the various ratios and models used to enable for an accurate and complete interpretation. The data was thereafter analyzed using a statistical computer package, the SPSS. The coded data was entered into SPSS program hence analyzed.

There are normally two main parts in this section as shown below.

3.5.1 Conceptual Model

This takes the form of a mathematical function:

$$Y = f(x_1) \quad (1)$$

Financial Performance = f (Mobile Banking Deepening)

In this study, independent variable is the banking industry financial deepening which is measured through total commercial bank deposits as a percentage of GDP in the last five years. The financial performance is the return on assets of the bank.

Theoretically, financial development creates enabling conditions for growth through either a supply-leading (financial development spurs growth) or demand- following (growth generates demand for financial products) channel. A large body of empirical research supports the views that development of the financial system contributes to growth. Empirical evidence consistently emphasizes the nexus between finance and growth, though the issue of direction of causality is more difficult to determine. At the cross -country level, evidence indicates that various measures of financial development (including assets of financial intermediaries, liquid liabilities of financial institutions, domestic credit to private sector, stock and bond market capitalization) are robustly positively related to economic growth (King and Lavine, 1993; Lavine and Zervos 1998). Even the recent endogenous growth literature, building on learning by doing process, assigns a special role to finance.

Financial deepening implies the ability of financial institutions to effectively mobilize savings for investment purposes. The growth of domestic savings provides the real structure for the creation of diversified financial claims. It also presupposes active operation of financial institution in the financial markets, which in turn entails the supply of quality (financial) instruments and financial services. Financial deepening generally entails an increased ratio of money supply to cross domestic product (Nnanna and Dogo, 1998 and Nzotta, 2004).

3.5.2 Analytical Model

This is the algebraic expression of the conceptual model. It has the constant term, the coefficients, and the error term. It is illustrated below:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad (2)$$

Where:

Y is the dependent variable (financial performance i.e. ROA)

β_0 is the regression constant

$\beta_1, \beta_2, \beta_3, \beta_4,$ and β_5 are the coefficients of independent variables,

X_1 = number of customers reached through Mobile Banking Technology annually/ Total number of customers annually

X_2 = volume of transactions that are handled through mobile banking annually/ volume of transactions annually

X_3 = deposits that have been mobilized through mobile banking innovations/ Total deposits that have been mobilized number of from customers annually

X_4 = Size of the company is measured by natural logarithm of total asset

X_5 = Liquidity is measured using current ratio= current asset/current liability

The study used linear regression model equation to test between the independent and dependent variables. The significance of each independent variable was tested with t and f tests at a confidence level of 95%. In this study independent variable banking industry financial deepening which is measured through total commercial bank deposits as a percentage of GDP in the last five years while dependent variable was Financial Performance.

3.6 Data Validity and Reliability

Joppe (2009) provides the following explanation of what validity is in quantitative research where validity determines whether the research truly measures that which is intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda & Mugenda, 2003). Kothari (2009) reliability refers to consistency of measurement; the more reliable an instrument is, the more consistent the measure. Reliability is influenced by random error. As random error increases, reliability decreases. Random error is the deviation from a true measurement due to factors that have not effectively been addressed by the researcher (Mugenda & Mugenda, 2003). The researcher attempted to minimize random error and hence increase the reliability of the data collected by administering the same instrument twice to the same group of subjects.

Researchers generally determine validity by asking a series of questions, and often looked for the answers in the research of others. Wainer and Braun (2008) described the validity in quantitative research as "construct validity". The construct is the initial concept, notion, question or hypothesis that determines which data is to be gathered and how it is to be gathered. They also assert that quantitative researchers actively cause or affect the interplay between construct and data in order to validate their investigation, usually by the application of a test or other process. The use of expert opinions, literature searches, and pretest open-ended questions

helped to establish content validity.

4. Data Analysis Result and Discussion

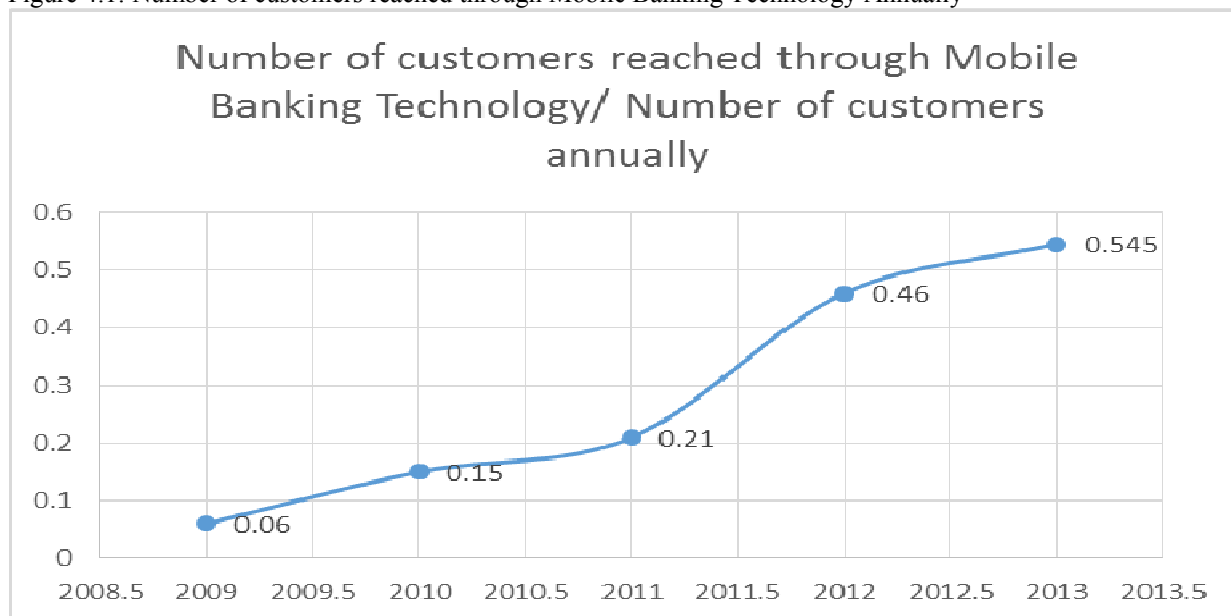
This section presents the data analysis and interpretation of the results. It provides various sections. Section 4.2 provides the Summary Statistics, Section 4.3 provides the Empirical Model of the study, Section 4.4 presents Discussion, and finally Section 4.5 provides Summary of the section.

4.2 Mobile Banking Deepening and Financial Performance

Number of customers reached through Mobile Banking Technology/ Number of customers annually

The study sought to establish the developments in the number of customers reached through mobile banking technology customers among commercial banks in Kenya from the year 2009 to 2013. This was done by calculating the ratio of number of customers reached by mobile banking technology, against the total number of customers annually. The findings were as shown in the Figure 4.1 below.

Figure 4.1: Number of customers reached through Mobile Banking Technology Annually



Source: Author's computations, (2014)

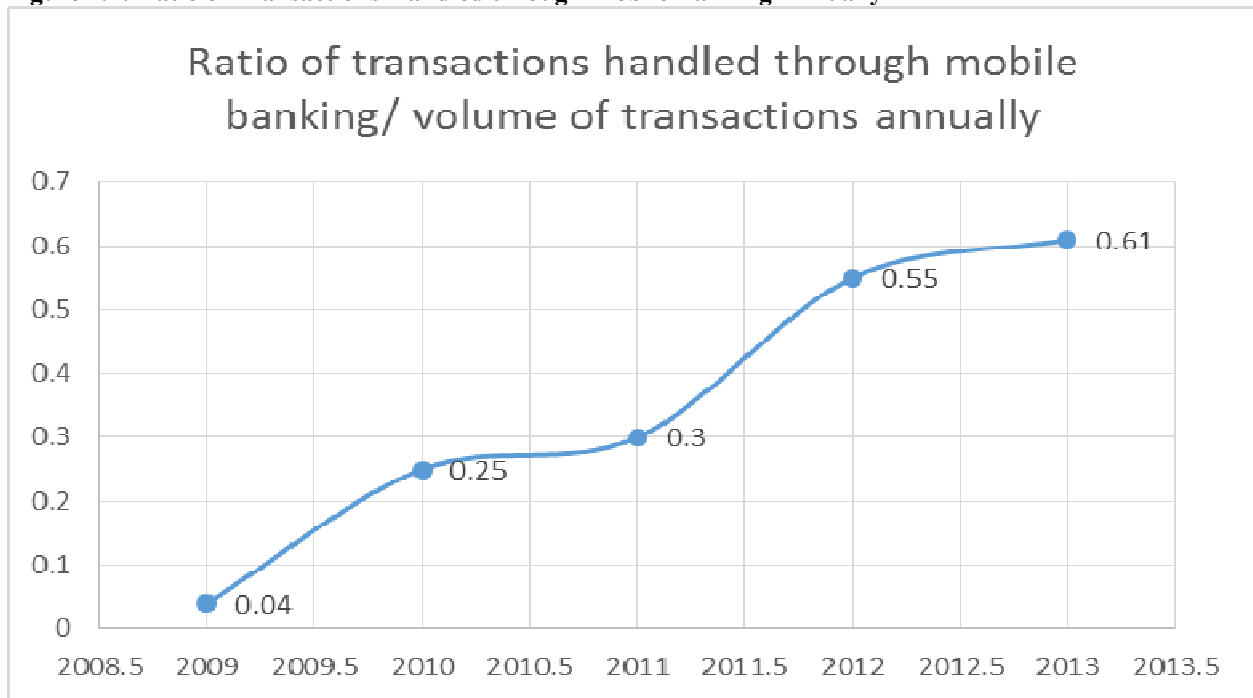
From the findings presented above, the study established that in the year 2009, there were 5.48 million users in January which grew again throughout the year to reach 8.88 by December. This translated into an annual average of 7.265 million users. For the year 2010, the number of users were 9.48 million in January. The positive trend in the number of users continued in this year to close at 16.45 million users. The annual average was 12.6875 million users. The year 2011 started on 16.69 million users which again grew steadily throughout the year to close at 19.19 million users in December. This translated into an annual average of 18.2125 million users. The positive trend in the number of users continued thereafter, reaching 21 million by December 2012 and 23.75 million by the end of 2013.

These findings show that as time lapsed, the number of mobile banking users increased. The commercial banks could now start enjoying economies of scale as more and more customers adopted mobile banking. This affected the banking operations especially the staff costs positively as the number of customers visiting the banking halls to transact could tremendously reduce as more and more customers adopt mobile banking. The resulting effects could be better services in the banking halls as they would be less congested. This could also lead to a reduction in the headcount offering services in the banking halls. The adoption of mobile banking also contributes positively to the provision of standardized services.

Volume of transactions that are handled through mobile banking annually/ volume of transactions annually

The study sought to establish the volume of transactions that are handled through mobile banking annually against the volume of transactions annually. The findings were as indicated in the figure 4.2 below.

Figure 4.2: Ratio of Transactions Handled through Mobile Banking Annually



Source: Author's computations, (2014)

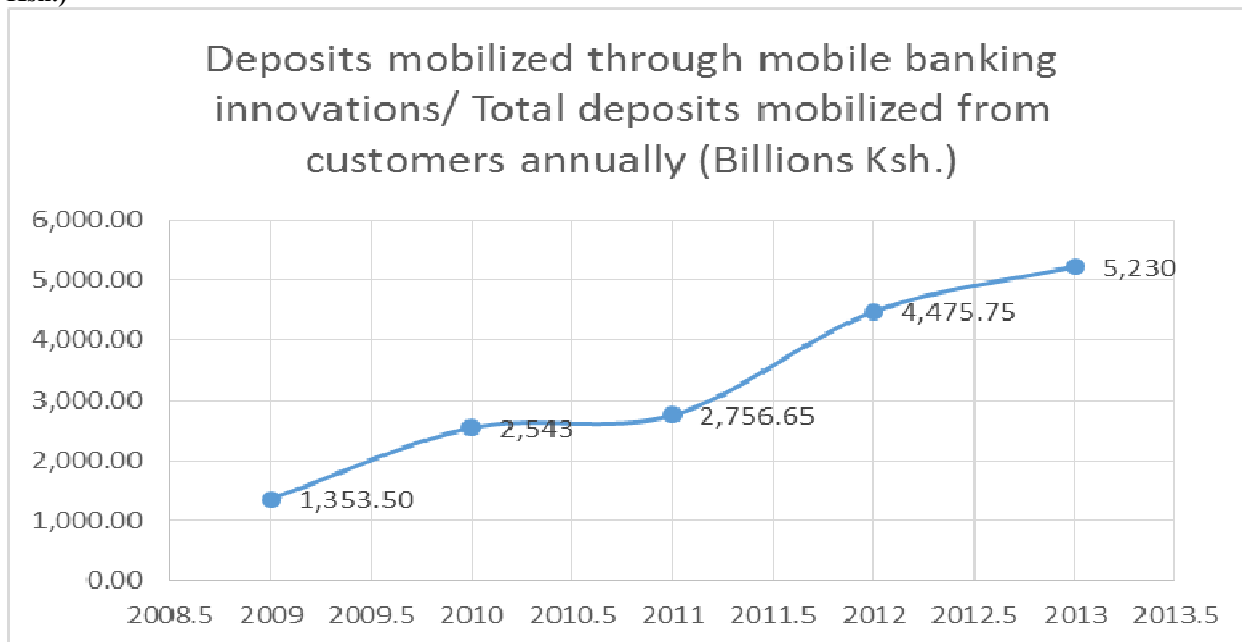
From the findings illustrated in the figure 4.2 above, the study established that in the year 2009, the total amount moved through mobile banking in January was Ksh. 27.07 billion which still grew rapidly during the year to close at Ksh. 52.34 billion in December. The annual average stood at Kshs. 39.4525. For the year 2010, the amount moved by end of January was Kshs. 48.46 billion. This amount grew steadily during the year to close at Kshs. 70.27 billion. The annual average was Kshs. 61.01833 billion.

During the year 2011, the number of companies offering mobile money transfer had increased to six, namely; Safaricom (M-Pesa), Airtel Networks (Airtel Money), Essar Telkom (Yu Cash), Orange Telkom (Orange Money), Mobile Pay (Tangaza) and Mobikash (Mobikash). The amounts transacted through these services were maintained high above 75 billion. Notably, there was a characteristic fluctuation in transaction during this year. This opened the way for large volumes of transactions handled through mobile banking technology in the subsequent years of 2012 and 2013, from a low figure of Ksh 27.07 billion in January 2009 to Ksh. 207.08 billion by the end of the study period.

Deposits mobilized through mobile banking innovations/ Total deposits mobilized from customers annually (Billions Ksh.)

The study at this part aims at identifying deposits that have been mobilized through mobile banking innovations/ Total deposits that have been mobilized number of from customers annually. The figure below shows the research findings.

Figure 4.3: Deposits mobilized through mobile banking innovations from customers annually (Billions Ksh.)



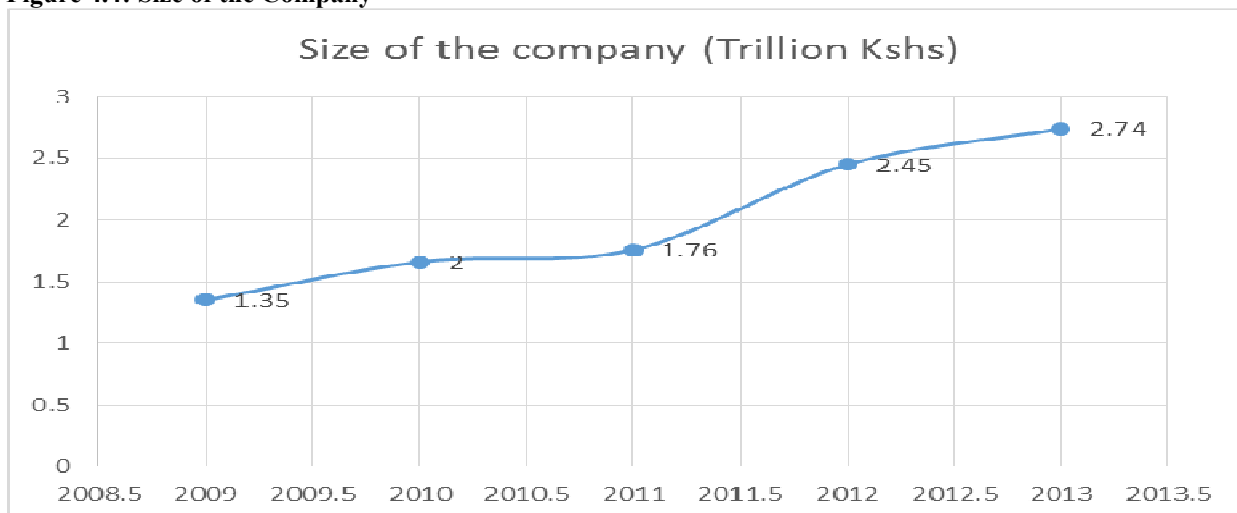
Source: Author's computations, (2014)

From the research findings, deposits that have been mobilized through mobile banking innovations have been increasing from 2009 to end of the study period this is attributed by the fact that banking customer are embracing the mobile banking technology.

Size of the Company

This part of the study sought to find the size of the company is measured by natural logarithm of total asset. The figure below shows the findings.

Figure 4.4: Size of the Company



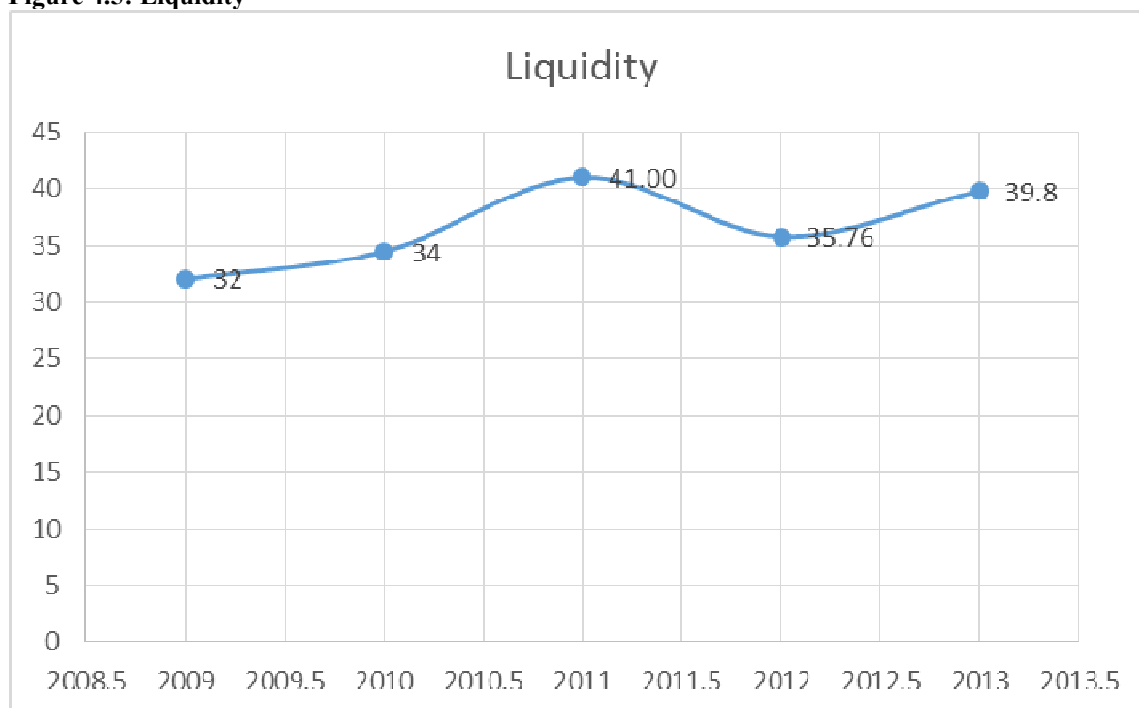
Source: Author's computations, (2014)

Total assets grew by 14 percent from Ksh. 1.35 trillion in January 2009 to Ksh. 2.74 trillion in December 2013. The growth was mainly underwritten by an increase in loans and advances. Deposits increased by 26 percent from Ksh. 864 billion at beginning of January 2009 to Ksh. 1.4 trillion in December 2013. This growth was supported by aggressive deposit mobilization by banks and branch expansion. The sector's pre-tax profit increased by 13 percent from Ksh. 43.3 billion at beginning of January 2009 to Ksh. 98.9 billion in December 2013. The increased profitability was largely attributable to the growth in credit.

Liquidity

The study at this part aimed at assessing liquidity, this was measured using current ratio which is the current asset divided by current liability. The figure below shows the research findings.

Figure 4.5: Liquidity



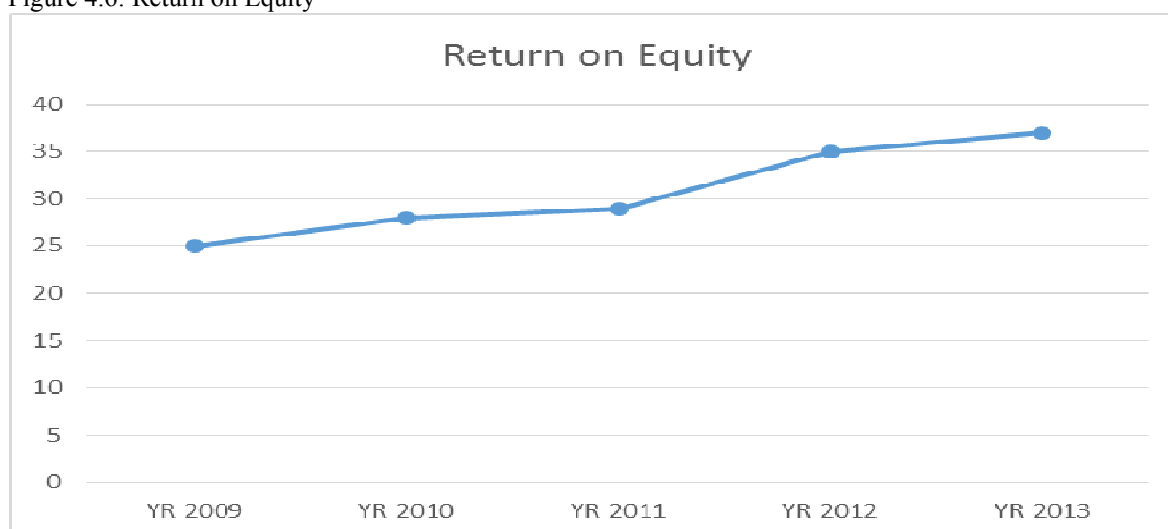
Source: Author's computations, (2014)

Liquidity which represents the ability to fund increases in assets and meet obligations as they fall due is crucial to the continued viability of any banking institution. The importance of liquidity goes beyond the individual bank as a liquidity shortfall at an individual bank can have systemic repercussions. For the period ended December 2013, the banking sector average liquidity ratio exceeded the minimum regulatory requirement. The liquidity ratio closed at 39.8 percent at the end of December 2013 in comparison with 32.0 percent reported in January 2009 and all institutions met the minimum liquidity ratio requirement of 20%. The high liquidity ratio is as a result of the banking industry's preference to invest in the less riskier government securities.

Financial Performance of Commercial Banks

The study analyzed the consolidated financial performance of the banking sector during the study period. The findings were as shown in the figure 4.3 below:

Figure 4.6: Return on Equity



Source: Author's computations, (2014)

From the study findings in figure 4.3 above, the study established that the performance of the banking industry began at its lowest point in the study period at 24.93 in the year 2009. This could be attributed to many factors beyond this study as the performance of commercial banks in a function of more variables including the macroeconomic variables besides the mobile banking deepening being looked at in this study. The ROE picked

an upward trend in the year 2010 to stand at 27.94%. The upward trend was maintained in the subsequent years to stand at 30.72% in 2011, 34.96% in the year 2012 and 36.97% in the year 2013 respectively. From the findings presented above, the findings show that the performance of the banking sector was slightly low during the years 2008/2009. This could largely be attributed to the post-election violence that rocked the Country in this period.

4.3.1 Results of Model Goodness of t-Test

Table 4.1: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	6.165	.705		8.746	.000
Number of customers reached through Mobile Banking Technology.	-.348	.081	-.489	-4.289	.000
Liquidity.	-.436	.084	-.635	-5.187	.000
Size of the company	.4537	.365	.547	4.376	.000
Deposits mobilized through mobile banking innovations	.711	.108	.754	6.593	.000
Volume of transactions that are handled through mobile banking annually	-.286	.084	-.396	-3.420	.002

a. Dependent Variable: Financial performance of commercial banks in Kenya

The established multiple linear regression equation becomes:

$$Y = 6.165 - 0.348X_1 - 0.436X_2 + 0.711X_3 + 4537X_4 - 0.286X_5$$

The researcher conducted a regression analysis so as to determine the relationship between mobile banking deepening and financial performance of commercial bank in Kenya. The study found that Volume of transactions that are handled through mobile banking annually, Liquidity, Deposits mobilized through mobile banking innovations, Number of customers reached through Mobile Banking Technology have significant influence on Financial performance of commercial banks in Kenya since Number of customers reached through Mobile Banking Technology $\beta = -.348$, $t = -4.289$, $p < .000$; Liquidity $\beta = -.436$, $t = -5.187$, $p < .000$ *; Deposits mobilized through mobile banking innovations $\beta = .711$, $t = 6.593$, $p < .000$ *; Size of the company $\beta = .711$, $t = 6.593$, $p < .000$ *; Volume of transactions that are handled through mobile banking annually $\beta = .406$, $t = 5.445$.

According to the regression equation established, taking all factors (number of mobile banking users and total value moved through mobile banking) constant at zero, the financial performance of the banking sector will be 26.123%. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in number of users will lead to a 0.012 increase in financial performance of the banking sector. A unit increase in the amount of money moved through mobile banking will lead to a 0.118 increase in the financial performance of the banking sector. This notwithstanding, the study shows that there is a positive significant correlation between mobile banking deepening and financial performance of commercial banks in Kenya. Therefore, it can be deduced that mobile banking has an impact on the financial performance of commercial banks.

4.3.2 Results of ANOVA

Table 4.2: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.976	4	1.494	16.377	.000 ^a
Residual	3.466	38	.091		
Total	9.442	42			

ANOVA findings (P- value of 0.00) in table 4.6 show that there is correlation between the predictor's variables (Volume of transactions that are handled through mobile banking annually, Liquidity, Size of the company, Deposits mobilized through mobile banking innovations, Number of customers reached through Mobile Banking Technology) and response variable (Financial performance of commercial banks in Kenya). An F ratio is calculated which represents the variance between the groups, divided by the variance within the groups. A large F ratio indicates that there is more variability between the groups (caused by the independent variable) than there is within each group, referred to as the error term. A significant F test indicates that we can reject the null hypothesis which states that the population means are equal. The P value is 0.000 which is less than 0.005 significance level.

4.3.3 Estimated Model

In order to establish the relationship between the mobile banking deepening and the financial performance of the

banking sector in Kenya, the study conducted a multiple regression analysis. The findings were as shown in the table 4.1 below:

Table 4.3: Results of Model Goodness of Fit Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Dimension 1	.796	0.633	0.594	0.30202

Source: Author's computations, (2014)

Analysis in table 4.7 shows that the coefficient of determination (the percentage variation in the dependent variable being explained by the changes in the independent variables) R^2 equals 0.633 that is, Volume of transactions that are handled through mobile banking annually, Deposits mobilized through mobile banking innovations, Number of customers reached through Mobile Banking Technology, Size of the company and Liquidity leaving only 1.5 percent unexplained. The P- value of 0.000 (Less than 0.05) implies that the model of Financial performance of commercial banks in Kenya is significant at the 5 percent significance.

4.4 Discussion

From the findings presented above, it is evident that as the number of mobile banking users increased, the monthly amount transacted through mobile banking also increased. At the beginning in the year 2009, the users were few as many individuals must have been skeptical as regards the security of mobile banking, considering the fact that the technology was the first of its kind since inception in 2007. However, as more and more people learned of the safety of the service, they adopted it and hence the increase in the amount of money transacted through mobile banking. These findings are consistent with the argument by Al-Jabri (2012) who studied mobile banking adoption by looking at the application of diffusion of innovation theory and established that with better mobile banking support and provision of variety of services, the more useful customers perceive mobile banking to be and to increase their level of adoption.

The increase in the number of users shows confidence among mobile banking users. This shows that commercial banks took keen interest in ensuring minimal risk exposure for their customers. As Al- Jabri (2012) suggested, banks must seek to reduce risk perceived by their customers by offering specific guarantees protecting them and taking their complaints seriously and urgently.

The study indicates that there is a weak positive insignificant correlation between mobile banking deepening and financial performance of commercial banks in Kenya. This was largely because the financial performance of commercial banks is a function of many other variables not looked at in this study. However, with the increasing levels of adoption of information technology, commercial banks that adopt the latest information technologies are likely to outperform those who may rely on brick and mortar branch.

From the findings, the performance of commercial banks as measured by return on equity was the lowest in the year 2009 at 24.93. This could be largely attributed to the post-election violence witnessed in Kenya which may have had negative effects on overall economic performance in the Country. As indicated earlier, financial performance of commercial banks is a function of many other variables not looked at in this study. However, despite this, the amount of money transacted through mobile banking and number of users maintained a positive increase.

There is also a directly positive relationship between number of mobile banking users and the amount of money moved through mobile banking over the study period. However, the two independent variables that were studied, explain only 37% of the changes in the financial performance of commercial banks in Kenya as represented by the R^2 . The study shows that there is a weak positive insignificant correlation between mobile banking deepening and financial performance of commercial banks in Kenya.

5. Conclusions

From the research findings presented in section four and above summary of findings, the study concludes that there is a weak positive relationship between mobile banking and financial performance of commercial banks in Kenya. This could be attributed to the trends recorded in the two variables where the number of users and monthly transfers maintained a positive growth rate while financial performance of commercial banks was affected by many variables which have major impacts compared to the adoption of mobile banking. Financial performance of commercial banks in Kenya was majorly affected by macro-economic variables like post-election violence, inflation and foreign exchange rates fluctuations among other macro-economic variables which were outside the scope of this study.

6. Policy Recommendations

From the above conclusion, the study recommends that policy makers consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services. This is because despite negligible relationship between mobile banking deepening and financial performance of commercial banks in Kenya, the impact could be

pronounced if much change is recorded in technological developments and more customers adopt mobile banking services. This is because the relationship may not be direct but an indirect one resulting from the convenience that the mobile banking services offers to commercial banks.

Mobile banking is being used to improve financial operations in commercial banks. The banks have put in place measures to become more competitive by training its staff, investing in research and development of technology. In the long run, mobile banking is likely to have major impacts on the profitability of commercial banks as it smoothes business operations.

The study further recommends that commercial banks keep adopting and using mobile banking in their operations because the number of people with access to a mobile hand set is increasing every day. In addition, the convergence of mobile phones and commercial banks has revolutionized the banking operations. For example, Safaricom limited in conjunction with Commercial Bank of Africa launched M-Shwari services which provide registered members an opportunity to borrow money from the bank and repay conveniently. This has introduced another perspective that is likely to revolutionize the banking operations for increased profitability.

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