

**THE EFFECT OF FINANCIAL DEEPENING ON PRODUCTIVITY OF
COMMERCIAL BANKS IN KENYA**

BY

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DECLARATION

This research project is my original work and has not been presented for degree in any other University.

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This research project has been submitted for examination with my approval as University supervisor.

Supervisor

Sign.....

Date.....

DEDICATION

I dedicate this research work to wife Damaris and daughter Gracia, who are my inspiration in everything I do and every choice I make. To my mum and dad, who always supported and inspired me immensely in every endeavour, you made me whom I am today.

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ABBREVIATIONS AND ACRONYMS

GDP: - Gross Domestic Product

CRB: - Credit Reference Bureau

CIR: - Cost Income Ratio

CIS: - Credit Information Sharing

NPL: - Non-Performing Loans

NSE: - Nairobi Securities Exchange

CBK: - Central Bank of Kenya

SME's: - Small and Medium Enterprises

DEA: - Data Envelopment Analysis

OBS:- Off Balance Sheet

NBFI's:- Non Bank Financial Institutions

ROA:-Return on Investment

ROE:-Return on Equity

TFP:-Total Factor Productivity

M&A:-Merger and Acquisition

SSA:-Sub-Sahara Africa

DMBA:-Domestic Money Bank Asset

GDP:-Gross Domestic Product.

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ABSTRACT

The link between financial deepening and economic growth has long received significant attention in economics, however, the waves of financial deepening cannot raise the tide of the economy without affecting bank productivity; it is against this background that this study was formulated to examine the effects of financial deepening on productivity of commercial banks in Kenya. The study targeted all the commercial banks in Kenya. Secondary data was collected from the Kenya National Bureau of Statistics, Central Bank of Kenya and websites of licensed Commercial banks in Kenya. The study used both explanatory research design and inferential statistics to investigate the effect of financial deepening on productivity of commercial banks. The findings of the study revealed that financial deepening affects bank productivity positively. The results of this paper therefore, present a strong argument towards increasing financial deepening as an important stimulator of greater banking productivity. While Kenya still exhibits relatively low levels of financial deepening, commercial banks productivity displays an increasing trend in recent years. An increase in money supply in the economy may be an important determinant of further banking productivity increases in the future. Therefore, policy oriented measures in the country should take in consideration the positive causality between financial deepening and banking productivity and try to increase the level money supply as a stimulant of economic growth.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

During the past few decades, the Kenyan financial system experienced profound changes, including the liberalization of banking sector, the privatization of financial institutions and the opening of the markets to attract foreign investments. Such reforms during the early 1990s were expected to increase savings and investment in the country and ultimately produce higher growth rates (Aizenman, 2005). There was need to open up the financial system for the developing economies. In the 1990s the economies were characterized by extensive regulation, administration of interest rates, direct credit programs, weak banking structure, lack of proper risk management systems, and lack of transparency in operations among other factors. Supporters of development hypothesis theory believe that the lack of a developed financial infrastructure restricts economic growth. Thus, the focus of policy at each point in time should be to ensure that the financial system operates efficiently such that the real sector will receive the necessary support. The acceptance of the hypothesis theory made economic theorists to conclude that a measure of intervention is important and in fact necessary for meaningful growth. Various policies should thus be put in place to encourage and promote the activities of financial institutions in this regard, (Nzotta and Emeka (2009).

On the other hand, the studies by Mckinnon and Shaw (1973) observed that financial repression is correlated with sluggish growth in developing countries. The implication of their studies is that financial development would contribute most significantly to economic growth, if monetary authorities did not interfere in the operations of financial institutions and the financial infrastructure generally. Such economies, according to Nnanna and Dogo (1998) are typically characterized by high and volatile inflation and distorted interest and exchange rate structures, lowsavings and investments and low level of financial intermediation, as interest rates do not reflect the cost of capital. Institutions that spearhead financial deepening include financial intermediaries, regulatory agencies, financial market systems and the government.

Financial inclusion is meant to increase access to financial services, to facilitate legal, regulatory and institutional reforms and need for portfolio diversification, which will be facilitated by legal framework, technology, institutional reforms, regulatory institutions, innovations in financial markets. Commercial banks as financial institutions hold a special place in the economy of a country because of their ability to efficiently transform financial claims of savers into claims (advances) issued to business, individuals, and governments (Mishkin and Eakins, 2007). Chortareas et al (2011) noted that regardless of the transmission channel, however, one would expect that the waves of financial deepening cannot raise the tide of the economy without affecting bank performance, particularly in emerging economies where the banking sector is the main supplier of funds to the financial system.

1.1.1 Financial Deepening

The modern economic analysis of financial policy in developing countries was initiated with the seminal works of McKinnon (1973) and Shaw (1973). McKinnon and Shaw argued that this financial repression was imposing major costs on the countries that practiced it. For one thing, sub-market real interest rates would tend to repress the level of saving, and thereby investment. In addition, the failure to ratio credit by price would result in an inefficient allocation of what savings there were. Growth would suffer on both counts: too little would be saved, and what savings there were would not be allocated to those uses promising the best return, and thus would not contribute as much as potentially possible to the rate of growth.

One of the main objectives of financial sector reforms is to boost financial depth, which thus leads to an increase in the resources available for financial intermediation (Odhiambo, 2005).

Shaw and McKinnon (1973) defines financial deepening as the improvement or increase in the pool of financial services that are tailored to all the levels in the society. It also refers to the increase in the ratio of money supply to Gross Domestic Products or price index which ultimately postulates that the more liquid money is available in the economy, the more opportunities exist in that economy for continued and sustainable growth. It basically supports the view that development in financial sectors leads to development of the economy as a whole.

Financial sector deepening enable the financial intermediaries perform their functions of mobilizing, pooling and channelling domestic savings into productive capital more effectively thereby contributing to economic growth of a country (Ndege, 2012). In addition to mobilizing savings and improving capital allocation (Boyd and Prescott, 1986), financial deepening reduces the extent and significance of information asymmetries (Stiglitz and Greenwald, 2003) and allows for risk transformation and monitoring (Diamond 1984). Financial sector deepening has been seen to lead to access of long term capital which deemed crucial for economic development as evidenced by the positive relationship between long term capital and economic growth (Klapper & Panos, 2007).

Financial deepening generally entails an increased ratio of money supply to gross domestic product (Nnanna and Dogo, 1998; and Nzotta, 2004). Financial deepening is thus measured by relating monetary and financial aggregates such as M1, M2 and M3 to the gross domestic product (GDP). The logic here is that, the more liquid money is available in the economy, the more opportunities exist for the growth of the economy. Financial deepening can therefore be defined as the ratio of money supply to GDP, is a function of domestic credit provided by banking industry as a percentage of GDP, domestic credit to private sector as a percentage of GDP, financial savings to GDP, rate of inflation, real lending rates, deposit money bank assets to GDP, currency outside banks to money supply and the Dummy. Studies attempting to link financial deepening and economic growth have chosen a number of proxy measures and subsequently, have come up with different results (see King and Levine, 1993; Khan and Senhadji, 2000; among others). Therefore, studies using different indicators of financial development not only find a positive correlation between financial sector and growth, but also conclude that the development of bank credit has an important impact on economic growth.

Financial Deepening in Kenya took place in the early 1990s where Kenyan financial system experienced profound changes, including the liberalization of banking sector, the privatization of financial institutions and the opening of the markets to attract foreign investments. Such reforms during the early 1990s were expected to increase savings and investment in the country and ultimately produce higher growth rates (Aizenman, 2005).Berkaert (2005) says that it is financial liberalization which leads

to financial deepening and higher economic growth. Advances in mobile phone technology and agency banking have made it possible for the banks to access the unbanked and the poor cost-effectively thus improving banks productivity. The advent of credit referencing has also made it possible for banks to “comfortably” lend to the hitherto shunned poor population because the problem of information asymmetry which heightens credit risk has now been resolved.

M-pesa in Kenya now probably represents the best example of the most successful mobile money scheme. Launched in March 2007, M-pesa allows customers to transfer and receive funds and also shop with money charged or credited to their mobile phones. Afful (2011) narrates the success as follows: For Safaricom, the statistics at the outset encouragingly showed the need for such a service: 81 percent of the population was unbanked, 19 percent had access to banking services but largely in urban areas, and 55percent of the population had access to mobile phones in 2007 when the service was launched. There were more mobile phones than there were bank accounts in Kenya. In 2005, mobile telephone subscribers stood at 4.5million in Kenya; by 2008 this figure had risen to 12.9million. It was estimated that for 2011, there were more than 22 million mobile phone users and this is a conservative estimate. As customer up-take of the service M-pesa offers has grown, so has the need to provide other mobile financial services in Kenya.

Currently, Safaricom as partner with financial institutions to provide mobile banking services which allows account and non-account holders to transfer money to and from their Bank accounts, check account balances, apply for loan facility on phone. Customers are able to check their bank balances on their mobile phones with no need to visit a bank branch. Agency banking is fairly a recent initiative in Kenya. FSD Kenya (2010) notes that it was in 2009, when the Central Bank of Kenya (CBK) commenced measures to open up banking channels to non-bank agents. An amendment to the Banking Act (passed as part of the Finance Act (2009) allowed banks to start using agents to deliver financial services. Using small shops, petrol stations, pharmacies and other retail outlets as agents could have a dramatic impact on improving access to financial services, especially in rural areas. This was expected to lead to substantial reduction in branch set up costs and also additional delivery

channels hence easier to tap more deposits and transaction based income thus improving bank productivity.

1.1.2 Bank Productivity

The valuation of the productivity of the banking system presents a major interest for the public authorities because an increase of the productivity of banks can lead to better banking performances, the decrease of costs and improvement of the quality of services, as well as to an improvement of the allocation of resources and increase of productivity on the level of the entire economy. The increase of productivity contributes, also, to the increase of the soundness and stability of the banking system provided that the achieved profits are channeled towards the increase of equity and of provisions that allow for a better absorption of risks (Casu et al., 2004).

The conceptual and empirical problems that plague the measurement of physical output in most service industries are particularly acute in the banking sector, where there is no clear consensus on an appropriate definition of output. For example, since banks engage in intermediation, are their deposits to be measured as an input or an output? The most common response to this problem is to examine indicators of productivity in the banking sector that are generally derived from accounting data. For example, in the 1989-90 Commonwealth Government Budget Papers, the Commonwealth Treasury presented the decline in the ratio of operating costs (excluding provisions for bad debts) to average assets as evidence that productivity improvements in the banking industry had indeed occurred (Oster & Antioch, 1995). Other frequently-used accounting measures include the ratios of operating income to costs or staff expenses.

The aspects of measuring, analyzing and optimizing operational performance play a vital role when the decrease of margins is considered. Especially, the evaluation of productivity and efficiency of banks is critically important (Burger, 2008).

1.1.3 Financial Deepening and Bank Productivity

Recent studies address how financial development affects economic growth through greater productivity. Particularly, Levine et al. (2000), Arestis et al. (2002) (2006) argue that financial development affects economic growth through productivity

growth. There are various studies which suggest that financial development may enhance greater economic productivity and contribute to a more efficient allocation of capital, and thus lifts the returns to financial resources, which raises productivity (King and Levine 1993; Beck et al. 2000).

The analysis of productivity of banks can be performed with both the help of the parametrical methods and that of non-parametrical methods. For a comparison of these methods see Berger and Humphrey (1997), Berger and Mester (2003) and Casu et al. (2004).

1.1.4 Banking Industry in Kenya

The Companies Act, the Central Bank of Kenya (CBK) Act and the Banking Act are the main regulators and governors of banking Industry in Kenya. These Acts are used together with the prudential guidelines which CBK issues from time to time. In 1995 the exchange controls were lifted after the liberalization of the banking sector in Kenya. According to the regulator of commercial banks in Kenya, CBK, as at June 30, 2012, the sector comprised 43 commercial banks, 1 mortgage finance company, and 6 deposit taking microfinance institutions, 5 representative offices of foreign banks, 115 foreign exchange bureaus and 2 credit reference bureaus.

CBK is tasked with formulating and implementation of monetary and fiscal policies. Central bank is the lender of last resort in Kenya and is the banker to all other banks. The CBK ensures the proper functioning of the Kenyan financial system, the liquidity in the county and the solvency of the Kenya shilling. According to the Central Bank of Kenya, the Kenyan banking sector was in the 80^{ies} and 90^{ies} saddled with a momentous Non-Performing Loans (NPLs) portfolio. This invariably led to the collapse of some banks. One of the catalysts in this scenario was Serial defaulters who borrowed from various banks with no intention of repaying the loans. Undoubtedly these defaulters thrived in the information asymmetry environment that prevailed due to lack of a credit information sharing mechanism.

Credit Reference Bureaus complement the central role played by banks and other financial institutions in extending financial services within an economy. CRBs help lenders make faster and more accurate credit decisions. They collect, manage and

disseminate customer information to lenders within a provided regulatory framework – in Kenya, the Banking (Credit Reference Bureau) Regulations, 2008 which was operationalized effective 2nd February 2009. Credit histories not only provide necessary input for credit underwriting, but also allow borrowers to take their credit history from one financial institution to another, thereby making lending markets more competitive and, in the end, more affordable. Credit bureaus assist in making credit accessible to more people, and enabling lenders and businesses reduce risk and fraud. Sharing of information between financial institutions in respect of customer credit behaviour, therefore, has a positive economic impact.

The agent banking model was designed to assist banks lower their cost of offering banking services that had been a major impediment to inclusion while at the same time improving banks' earnings as more Kenyans are offered an opportunity to access financial services. The use of the agency banking model by banks in Kenya has continued to improve access to banking services and has also increased financial deepening in the country since it was launched in 2010.

Central Bank of Kenya report dubbed Development in the Kenyan Banking Sector for the Quarter ended 30th June, since the inception of agent banking; the financial sector has recorded a tremendous growth with most Kenyans accessing finances at their convenience. This has reduced the cost of transaction and the time especially for the Kenyans in remote areas.

The increased number and value of transactions demonstrate the increased role of agent banking in promoting financial initiatives being championed by CBK. The increase is due to the fact that Banks and Financial related Institutions in Kenya are increasingly deploying the use of payments using agencies to enhance the quality of their financial services and increase growth. The pace of transformation in the financial sector speeded up with more agency banking businesses realizing the potential of using the agencies in transacting payments in their service delivery.

1.2 Research Problem

A high degree of financial deepening may affect banking efficiency and productivity through competition and ultimately a more efficient capital allocation which increases the productivity of investment. Moreover, financial deepening mobilizes savings into investment projects, which normally are passed on by the banking sector (Merton and Bodie, 1995). Financial deepening also increases the marginal productivity of capital through the intermediation function of well-informed financial institutions (King and Levine, 1993a; Beck, Levine, and Loayza, 2000). On the other hand, more efficient and profitable banks may increase the degree of financial deepening by increasing competition, improving their services, increasing their network penetration, enhancing transaction processes, and providing consumers with more financial products (e.g. by increasing the amount of credit).

Commercial banks in Kenya have contributed immensely to the financial deepening in Kenya. After the financial reforms carried out in the 1990s in Kenya, the banking industry was expected to become more competitive and an important catalyst for economic growth. One of the intended consequences of the financial liberalization in Kenya was to increase of financial development, for example through credit expansion. A number of studies produced solid empirical evidence on the nexus between finance and economic productivity and growth where the development of financial institutions is treated as a key component of financial deepening (Hua, and Liang, 2006) but Arestis, Chortareas&Desli (2006) drew attention to the fact that the literature rarely attempts to identify the particular mechanism through which this nexus materializes.

The bulk of the literature on financial deepening focuses on its macroeconomic dimension and its implications for growth (Chortareas, et al., 2011). The study shifts the attention to its microeconomic implications, especially the firm-specific effects, by shaping the environment within which banks operate. In particular, the study examines the possible effects of financial deepening on bank productivity in Kenya. Similar studies are lacking in Kenya. However, a similar study was conducted in Latin America by Chortareas, et al., (2011) who found a virtuous circle between financial deepening and bank productivity. Related studies in Kenya include the study by Sindani (2013) who examined the effect of financial deepening on economic

growth. Another study by Ochanda (2014) examined the effect of financial deepening on growth of SMEs in Kenya. To the best knowledge of the researcher, nothing has been done on the effect of financial deepening on bank productivity in Kenya. This study therefore addresses this gap in literature. The central question in this study is: how does financial deepening affect the productivity of commercial banks in Kenya?

1.3 Research Objective

The objective of this study is to examine the effect of financial deepening on the productivity of commercial banks in Kenya.

1.4 Value of the Study

This study will be important to the banks in Kenya. The results on how financial deepening influence productivity of banks would be important to the banks as they will instrumental in shaping the productivity of commercial banks in Kenya.

The study is also important for policy purposes as it is important for the right policy initiatives to be carried out in order to improve the performance of financial intermediaries. Thus, regulators can offer better policy for the financial sector in Kenya.

This study will also benefit the research community. Thus, researchers who are interested in carrying out further studies on financial deepening will find this study a valuable resource.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the existing literature review on the effect of financial deepening on bank productivity of Commercial Banks in Kenya. Section 2.2 discusses the theoretical literature where various theories on financial deepening are reviewed. Section 2.3 presents empirical literature where similar studies on financial deepening are reviewed. Section 2.4 presents review of local research and section 2.5 presents summary of literature review which summarizes the existing gaps on the literature.

2.2 Theoretical Literature

This study seeks to establish the effect of financial deepening on Commercial Banks in Kenya. The study is based on the following theories; the financial repression theory of financial deepening, the Schumpeterian theory of innovation, the openness theory of financial deepening, and the financial intermediation theory.

2.2.1 Financial Repression Theory of Financial Deepening

The supporters of development hypothesis theory believe that the lack of a developed financial infrastructure restricts economic growth. Thus, the focus of policy at each point in time should be to ensure that the financial system operates efficiently such that the real sector will receive the necessary support. The acceptance of the hypothesis theory made economic theorists to conclude that a measure of intervention is important and in fact necessary for meaningful growth. Various policies should thus be put in place to encourage and promote the activities of financial institutions in this regard (Nzotta & Emeka, 2009).

Financial repression theory is usually associated with the work of Mckinnon (1973) and Shaw (1973). The implication of their studies is that financial development would contribute most significantly to economic growth, if monetary authorities did not interfere in the operations of financial institutions and the financial infrastructure generally. The studies by Mckinnon and Shaw observed that financial repression is correlated with sluggish growth in developing countries. Such economies, according

to Nnanna and Dogo (1998) are typically characterized by high and volatile inflation and distorted interest and exchange rate structures, low savings and investments and low level of financial intermediation, as interest rates do not reflect the cost of capital.

2.2.2 Schumpeterian Theory on Innovations

Schumpeterian theory of innovative is associated with the work of John Schumpeter's (1934). The theory emphasized the role of entrepreneurship (his term was entrepreneurial profits) to seek out of opportunities for novel value and generating activities which would expand (and transform) the circular flow of income through risk taking, pro activity by the enterprise leadership and innovation which aims at fostering identification of opportunities through intellectual capital of entrepreneur to maximize the potential profit and growth. Schumpeter disapproved government intervention since he believed it would impair capitalistic development.

Schumpeterian growth theory goes beyond economist theory by distinguishing explicitly between physical and intellectual capital, and between saving, which makes physical capital grow, and innovation, which makes intellectual capital grow. It supposes that technological progress comes from innovations carried out by firms motivated by the pursuit of profit, and that it involves what Schumpeter called "creative destruction". That is, each innovation is aimed at creating some new process or product that gives its creator a competitive advantage over its business rivals; it does so by rendering obsolete some previous innovation; and it is in turn destined to be rendered obsolete by future innovations (Schumpeter, 1934).

Schumpeter, as cited by Swedberg (2000), pointed out economic behaviour is somewhat automatic in nature and more likely to be standardized, while entrepreneurship consists of doing new things in a new manner, innovation being an essential value. As economics focused on the external influences over organizations, he believed that change could occur from the inside, and then go through a form of business cycle to really generate economic change. He set up a new production function where the entrepreneur is seen as making new combinations of already existing materials and forces, in terms of innovation; such as the introduction of a new good, introduction of a new method of production, opening of a new market, conquest of a new source of production input, and a new organization of an industry (Casson,

2002). The implication of their studies is that entrepreneurial innovations and their role are the key drivers of economic growth associated with higher productivity.

2.2.3 Openness Theory of Financial Deepening

Openness theory of financial deepening is associated with the work of Levine and Renelt (1992). It suggests that financial regulation brings major benefits, such as, sharing risks among the investors, and capital flowing towards highly productive sectors. The theory argues that increased openness for financial development may be associated with greater risks, including exposure to external shocks and foreign competition (Huang and Temple, 2005). This may encourage the development of financial markets that can be used to diversify such risks, and that allow firms to overcome short-term cash flow problems or adverse shocks. The cross-country study of Levine and Renelt (1992) identified a robust correlation between openness and the share of investment in GDP and showed that, if trading economies have also high investment, this could promote financial development. While more open financial markets can contribute to economic development, it is the openness of financial markets that can make developing countries more vulnerable to financial disruptions (Kaminsky and Schmukler, 2001, and 2002).

The experience of several emerging market countries that have liberalized, in particular in South Asia, Latin America and in some countries in Eastern Europe show that the rapid process of financial sector liberalization, before the crisis, facilitated borrowing by domestic firms, large flows of capital and growth in lending and investment. When the crisis came, these forces of growing imbalances reversed, creating instability in the economies of these countries. Foreign financial service providers can be rejected or kept in a tight control by governments for following the possible reasons: infancy of the domestic financial system; probability of market dominance of foreign providers, due to their advanced technology or availability of financial resources and experience that may create dominance in the market, but also absence of commitment and outflows from domestic market (Schmukler, 2013).

2.2.4 Financial Intermediation Theory

Financial intermediation is a process which involves surplus units depositing funds with financial institutions who then lend to deficit units. Bisignano (1998) and Leland and Pyle (1977) identify that financial intermediaries can be distinguished by four criteria: first their main categories of liabilities (deposits) are specified for a fixed sum which is not related to the performance of a portfolio. Second the deposits are typically short-term and of a much shorter term than their assets. Third a high proportion of their liabilities are chequeable (can be withdrawn on demand). And fourth their liabilities and assets are largely not transferable. The most important contribution of intermediaries is a steady flow of funds from surplus to deficit units.

According to Scholtens and van Wensveen (2003), the role of the financial intermediary is essentially seen as that of creating specialized financial commodities. These are created whenever an intermediary finds that it can sell them for prices which are expected to cover all costs of their production, both direct costs and opportunity costs. Financial intermediaries exist due to market imperfections. As such, in a 'perfect' market situation, with no transaction or information costs, financial intermediaries would not exist. Numerous markets are characterized by informational differences between buyers and sellers.

In financial markets, information asymmetries are particularly pronounced. Borrowers typically know their collateral, industriousness, and moral integrity better than do lenders. On the other hand, entrepreneurs possess inside information about their own projects for which they seek financing (Leland and Pyle, 1977). Moral hazard hampers the transfer of information between market participants, which is an important factor for projects of good quality to be financed. Implication of their study is that through mobilizing, pooling and channelling domestic savings into productive capital more effectively contributes to higher banking productivity.

2.3 Determinants of Bank Productivity

Other than financial deepening, other factors have been found to influence bank productivity. These include size of the banks (either absolute size or mergers and acquisitions), bank ownership structures, off-balance sheet activities, among others. This section presents a review of a number of empirical studies on the determinants of bank productivity.

Sathye (2002) analysed the change in productivity of Australian banks from 1995 to 1999. The study measured productivity using the Malmquist index using a Data Envelopment Analysis (DEA) technique. The panel consisted of 17 local banks. One of the key findings was that there was no association between size and productivity suggesting that productivity of banks cannot be improved by increasing the size of a bank.

Isik (2007) examined the effect of bank ownership on productivity developments. Data was gathered from 51 banks in Turkey from 1981-1990 giving a total of 439 bank observations. The Malmquist index was used to measure productivity. The study found that state ownership had a negative effect on productivity. The results also showed that foreign ownership had a positive effect on bank productivity. Further, it was also shown that size of the bank had a negative effect on bank productivity.

Sufian (2008) examined the effect of off-balance sheet (OBS) activities on non-bank financial institutions' (NBFIs) productivity in Malaysia. Malaysian NBFIs from 2000 to 2004 were incorporated in the study. Productivity was measured using Malmquist Productivity Index (MPI) where the input vectors were total deposits and capital while the output vectors were total loans and investments. The OBS activities were proxied by non-interest income. The study found that OBS items enhanced the productivity of merchant banks while it worsened the productivity of finance companies.

Gaganis, Liadaki, Doumpos, & Zopounidis (2009) examined the efficiency and productivity of a Greek bank's branches. Data for a total of 458 branches of the bank was collected over the period 2002-2005 giving 1,795 observations. DEA was used to estimate the Malmquist index which was the proxy for productivity and efficiency. In terms of productivity, the study found that the logarithm of per capita gross fixed capital formation had a positive and statistically significant effect on total productivity. Finally, the return on assets (ROA), the logarithm of the personnel, the loans to deposits ratio and the logarithm of income in the region, had a positive and statistically significant impact on overall technical efficiency change.

Pasiouras & Sifodaskalakis (2010) investigated the total factor productivity (TFP) change in the Greek cooperative banking industry over the period 2000-2005. The

study employed Malmquist index to estimate productivity. A balanced panel of 13 cooperative banks with 78 observations was used in the analysis. One of the key findings was that TFP growth was higher for smaller banks but the relationship between size and productivity was not robust across years. Thus, while size may be a determining factor for bank productivity, the effect was not statistically significant.

Sanchez, *et al.*, (2013) also examined other determinants of efficiency other than banking and financial structure effects. They examined the effect of various bank characteristics such as loan loss reserves-to-grossloans, equity-to-total assets, net interest margin, return on average assets, return on average equity, overhead cost-to-income ratio, net loans-to-netfunds ratio, and the natural logarithm of total assets to proxy size of the banks. The results showed that net interest margin was negatively related to all measures of efficiency, with the exception of revenue allocative efficiency. The study further showed signs of association between efficiency measures and traditional measures of bank performance such as asset quality ratios (loan loss reserves over gross loans), capital ratios (equity over total assets), and operations ratios (ROE, ROA, and cost-to-income ratio).

Sanchez, *et al.*, (2013) also examined the effects of macroeconomic factors on efficiency of Latin American banks. The macroeconomic factors examined were GDP per capita (real 2000 US\$), GDP growth (annual %), inflation from the GDP deflator, real interest rate, gross domestic savings as a percent of GDP, and an interaction variable between the real interest rate and GDP per capita. The results showed that Latin American countries with larger economies tended to have lower bank efficiency, as implied by the fact that GDP per capita was negatively related to efficiency. The study also revealed that higher inflation and higher real interest rates negatively affected banking efficiency, whereas levels of savings in a country were positively related to revenue and allocative efficiency.

Hsiao & Lin (2013) examined the impact of merge and acquisition (M&As) on the productivity growth of commercial banks in Taiwan. The study used Malmquist index to estimate productivity through DEA. The sample consisted of 32 banks over the period 2004-2010 of which 15 were merged banks and 17 were non-merged banks. The study found that merged banks improved their productivity and scale efficiency

after the M&As especially for the mergers that involved voluntary mergers of small banks as opposed to large banks. This suggests that mergers influence bank productivity.

2.4 Empirical Review on Financial Deepening and Bank Productivity.

Economists have extensively debated the role of financial development on economic growth. Several studies have been carried out both globally and locally. In the global scene, it has been found that financial development affects GDP growth through productivity and technological advancement, Schumpeter (1934). Goldsmith (1969), in his earlier studies suggested that financial development can increase the Total Factor Productivity of the economy through increments in marginal productivity. McKinnon and Shaw (1973) suggested that financial development can improve the efficiency of capital allocation by increasing the overall degree of investment.

Greenwood and Jovanovic (1990) provide a theoretical analysis of ways in which financial Intermediation can enhance productivity and growth by allocating efficiently funds in investment projects with high rates of return. Bencivenga and Smith (1991) suggest that financial intermediaries contribute to the efficient allocation of funds by increasing liquidity and diversifying risk, which in turn influences productivity growth. They acknowledge that regulatory measures such as interest rate ceilings can inhibit this process, particularly in developing nations. Recent studies focus on the mechanisms that improve productivity to analyse the financial development-economic growth link. Benhabib and Spiegel (1994) found that financial development enhances growth through greater TFP and capital accumulation. Beck and Levine (2002) employ a cross-country panel data to test the relationship between financial structure, industry growth, and new establishment formation. They find that an efficient legal system and financial development are both strong determinants of industry growth, new establishment formation and efficient capital allocation.

Fisman and Love (2003) test how financial deepening affects productivity growth. They found that in the long-run more financially developed countries allocate a higher share of resources towards sectors that rely primarily on external finance. These industries which depend on external financing are most likely to invest in R&D and technology, and access to increased credit may stimulate greater productivity growth.

Bossone & Lee (2004) examined the relationship between production efficiency and financial system size. The study was carried out on 875 banks in 75 countries. The data covered 1995-1997. Absolute size of the financial system was measured as a constructed comprehensive indicator for open economies by summing domestic credit, domestic deposits, foreign assets, and foreign liabilities of the banking system, expressed in billions of U.S. dollars. Relative size of the financial system was measured using financial depth. The study found that financial depth was positively related to scale efficiency. This suggests that financial deepening has a positive influence on bank productivity.

Ndebbio (2004) examined the effect of financial deepening on economic growth and development. The study used growth rate of per capita (real/nominal) money balances (GPRMB/GPMB) and degree of financial intermediation/development (M2/GDP) as proxies for financial deepening. Data was collected for 34 countries in Sub-Saharan Africa (SSA) from 1980-1989. The study found that financial deepening had a positive effect on per capita growth of output. This implies that financial deepening influenced economic growth and development of SSA countries.

Hartmann et al. (2007) show that financial deepening in Eastern European countries has led to faster capital reallocation; they conclude that deeper credit markets enhance capital reallocation by contributing to an increase in economic productivity growth. Lower TFP has been explained in developing countries by misallocation of resources across productive units. Thus, the presence of financial frictions increases the misallocation of resources (G.E. Chortareas et al, 2008). Contrastingly, as the financial system develops, information and transaction costs associated with capital reallocation decrease while TFP increases (Hsieh and Klenow, 2007; Restuccia and Rogerson, 2007).

Odhiambo (2009a) examined the impact of interest rate reforms on financial deepening and economic growth in Kenya. The study used financial depth as a measure of financial deepening and it was measured using the ratio of broad money stock to gross domestic product (M2/GDP). Annual time series data from 1968 to 2004 was utilised. Using co-integration and error-correction models, the study found a positive impact of interest rate reforms on financial deepening in Kenya. The study

also revealed that financial deepening Granger cause economic growth in Kenya. Interest rate liberation therefore moderated the effect of financial deepening on economic growth in Kenya.

Odhiambo (2009b) examined the inter-temporal causal relationship between financial deepening and poverty reduction in Zambia. Annual data from 1969 to 2006 was used in the study. The study used three proxies of financial deepening namely broad money supply ratio ($M2/GDP$), domestic credit to the private sector as a ratio of gross domestic product (DCP/GDP) and domestic money bank assets ($DMBA$). Poverty reduction was measured using private per capita consumption. The study found that financial sector development leads to poverty reduction. This shows that financial deepening leads to poverty reduction.

The recent financial crisis brought to increasing importance of financial institutions and financial instruments in helping to reduce transaction and information costs in the economy, but also poses challenges. More recently, an abundant literature has also produced convincing evidence for the existence of a positive link between financial deepening and economic growth by increasing economic efficiency, investment and growth (Ndege, 2012).

Chortareas, *et al.*, (2011) examined the possible effects of financial deepening on bank productivity changes as well as the possibility of a two-way causality in Latin America. The authors obtained bank productivity estimates using the non-parametric Malmquist methodology. The data was obtained for 9 Latin American countries for the period 2000-2006 with a total of 973 observations. The dependent variable was total factor productivity while financial deepening was measured using the ratio of credit to the private sector to GDP. The study found strong evidence of causality from financial deepening to bank productivity and also evidence of reverse causality. The results suggested that a virtuous circle between financial deepening and financial institutions' productivity may exist.

Sanchez, Hassan, & Bartkus (2013) investigated the determinants of productivity across Latin American banking industries. DEA was used to estimate the Malmquist Index as a proxy for efficiency (productivity) for the banks for the period 1996-2007.

One of the independent variables was a vector for financial development: domestic credit to the private sector provided by banks as a percent of GDP, the total value of stocks traded as a percent of GDP, the total assets of the three largest banks divided by the total assets in the country, interest rate spread (lending rate minus deposit rate), and the number of banks in the country. Proxies for financial development showed mixed results. For instance, concentration, measured as total assets of the three biggest banks over the country's total bank assets, was negatively related to efficiency. Also, economic efficiency and allocative efficiency were negatively related to both credit provided by banks to the private sector and stocks traded as percentage of the GDP.

Kenyuru (2013) examined the effect of financial innovations on financial sector development (financial deepening). Financial deepening was measured as number of depositors with commercial banks and other institutions per 1000 adults. Financial innovations were measured as number of mobile money transactions, number of agency banking transactions, and value of m-banking transactions. The data was collected for the period 2007-2012. The results showed that mobile money transactions had a negative effect on financial deepening while value of m-banking transactions had a positive effect on financial deepening. The effect of agency transactions was not shown. However, none of the effects were significant suggesting no significant effect of financial innovations on financial deepening.

Sindani (2013) examined the impact of financial sector deepening on economic development in Kenya. The study used 44 commercial banks using data from 2007 to 2011. Financial deepening was measured using ATM network and deposit accounts. The results showed a negative effect of ATM network and positive effect of deposit accounts on economic development, measured as the GDP. This reveals that the consequences of financial deepening on economic development are mixed depending on the measure used.

Ochanda (2014) examined the effect of financial deepening on growth of small and medium-sized enterprises (SMEs) in Kenya with a specific focus on Nairobi County. Survey data was collected from 100 SMEs. Financial deepening was measured using financial innovations and credit access. The results showed that both credit access and

financial innovations had positive effects on growth of SMEs. These suggest that financial deepening positively influence growth of SMEs in Kenya.

2.5 Summary of Literature Review

The chapter has presented a review of literature. First, the theoretical review has presented four theories that are related to financial deepening and productivity. These theories are the financial repression theory of financial deepening, the Schumpeterian theory of innovation, the openness theory of financial deepening, and the financial intermediation theory. In this study, the results will be examined in relation with the theories to show which of the theories better fits the Kenyan market in terms of explaining the relationship between financial deepening and bank productivity.

The second part of the chapter focused on the review of empirical studies on the relationship between financial deepening and bank productivity. As was explained, most of the studies have focused on the effect of financial deepening on economic growth and very little is available on its effect on bank productivity. This is an area that needs more research and therefore provides a research gap for the present study. The studies reviewed under this section include some of the studies that have been done in Kenya. As can be observed from the review, none of the local studies have examined how financial deepening influenced bank productivity.

The review therefore forms a platform to examine what other relevant variables might be controlled for in the model to examine the relationship between financial deepening and bank productivity. The next chapter presents the research methodology.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted in this study. Section 3.2 discusses research design; section 3.3 discusses population of the study; section 3.4 discusses data and data collection instruments, and section 3.5 discusses data analysis process.

3.2 Research Design

This study adopted both descriptive and exploratory designs. Descriptive research design is a design that is used when the researcher wants to describe specific behaviour as it occurs in the environment (Greener, 2008). This study was justified since the study sought to explore the effect of financial deepening on productivity of commercial banks in Kenya.

3.3 Population

The study population was drawn from all the 43 commercial banks (see appendix 1 for the list) licensed and trading in Kenya as at 1st June 2015 (Central Bank of Kenya, 2015) banks during a period of financial reforms that enhanced financial depth, examining whether financial deepening affects bank productivity. The 43 commercial banks, therefore, formed the population of the study. Since the number of banks is not so large, all the 43 commercial banks were targeted in the study.

3.4 Data and Data Collection Instruments

The study used secondary data this was collected from the Central Bank of Kenya's Banking Supervision reports from all the banks for a period between 2005 and 2014. This data was collected from CBK's website which reports annually on the performance of the banking sector. Data was gathered from the Kenya National Bureau of Statistics and the World Bank database.

The study used secondary data covering the period 2005 to 2014. This was an era of development of financial institutions and financial liberalization in Kenya. Data was collected from Central Bank of Kenya, websites of licensed Commercial banks in

Kenya, and Kenya National Bureau of Statistics. All the variables on financial deepening and bank productivity of interest namely; advances of commercial banks to private sector, money supply (M3), domestic financial savings, and cost to income ratio of banks were obtained using a data collection guide. With the use of data collection guide, the researcher extracted the secondary data that are relevant to the study.

3.5 Data Analysis

Data collected was cleaned, sorted and collated. The data was then entered into the computer and analyzed. Using frequency distribution tables and line charts, descriptive statistics for each variable was calculated and tabulated.

3.5.1 Conceptual Model

The regression model used in the study was in the form of;

$$Y = f (D, G, S) \dots\dots\dots 1$$

In this specification, Y is the dependent variable which measured banking productivity; Productivity was measured by cost to income ratio of the banking sector.

While the independent variables D, G, S, measured the degree of financial deepening such that; D measured credit to the private sector in terms of GDP, G measured money supply, S measured gross domestic savings;

A positive relationship between the banking productivity and financial deepening was established. Greater financial deepening could be increasing the productivity level in the banking sector through increasing money supply. Study conducted in Latin America by Chartareas, et al., (2011) found a virtuous circle between financial deepening and bank productivity.

3.5.2 Analytical Model

To measure the effect of financial deepening on productivity of commercial banks the regression analysis specified as follows was used,

$$Y_{i,t} = \alpha_i D_i + \alpha_i G_i + \alpha_i S_i + \varepsilon \dots\dots\dots(2)$$

In this specification, Y is the dependent variable which measured banking productivity; while the independent variables D, G, S, measured the degree of financial deepening such that; D measured credit to the private sector in terms of GDP, G measured money supply, S measured gross domestic savings; α_i are the slope coefficients whose sign depicted the relationship between the dependent variable and the independent variable and ε is the disturbance term which measured the goodness of fit by capturing the effects of all other independent variables not included in the model.

The study used both the descriptive and inferential statistics in analyzing the data. Regression analysis was used to test the relationship between the variables. To test the relationship between the variables, inferential tests including the Pearson product-moment correlation coefficient and regression analysis was used. The correlation coefficient determined the strength of linear association between the variables. Correlation is always between -1.0 and +1.0. If the correlation is positive, then the variables have a positive correlation; if correlation is negative, then there is a negative relationship and if correlation value is 0, then, there is no relationship. To test for significance of regression model using Pearson correlation, the 'T' Statistic at 0.05 level of significance was used to measure the fitness and validity of the model.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis and findings of the study as set out in the research objective and research methodology. The study findings are presented on the effect of financial deepening on productivity of commercial banks in Kenya. The independent variables were credit to the private sector, money supply and gross domestic savings, while dependent variable is income to cost ratio. Section 4.2 discusses summary statistics and diagnostics; section 4.3 discusses correlation matrix; section 4.4 discusses regression results and section 4.5 discusses Summary and Interpretation of Findings.

4.2 Summary Statistics and Diagnostics

Descriptive statistics is the discipline of quantitatively describing the main features of a collection of information, or the quantitative description itself. Descriptive statistics are distinguished from inferential statistics, in that descriptive statistics aims to summarise a sample, rather than use the data to learn about the population that the sample of data is thought to represent.

Table 4.1: Descriptive Statistics.

	Mean	Standard Deviation
Cost to Income	58.10	5.38
Total Domestic Credit	1,033,869.00	383,592.00
Money Supply	1,187,243.00	452,134.00
Domestic Financial Savings	223,379.00	43,265.00

Source: Research findings.

For the independent variables in table 4.1 above, total domestic credit has as a mean of 1,033,869 and a standard deviation of 383,592, money supply has a mean of 1,187,243 and a standard deviation of 452,134 and domestic financial savings has a mean of 223,379 and a standard deviation of 43,265. A reasonable level of consistency is observed between the mean and standard deviation for all variables. For the dependent variable CIR has a mean of 58.10 and a standard deviation of 5.38.

4.2.1 Correlation Analysis

Correlation matrix helps in testing the relationship between the explanatory variable so that the strength of the variables can be determined, to help explain which variable best explain the relationship between productivity and measures of financial deepening. Correlation Matrix helped the researcher determine which variable was not strong enough in the model so that only the strong variables were picked for the model.

Table 4.2: Correlation between the study variables

	Cost to Income	Total Domestic Credit	Money Supply	Domestic Financial Savings
Cost to Income	1			
Total Domestic Credit	0.463	1		
Money Supply	0.462	0	1	
Domestic Financial Savings	0.009	0.074	0.077	1

Source: Research findings.

From the above findings in table 4.2, the spearman correlation coefficients, T-statistics are shown in parentheses. The strength of the association between the variables is defined by Pearson correlation scale where the correlation is between -1.0 and +1.0. If the correlation is positive, then the variables have a positive correlation; if correlation is negative, then there is a negative relationship and if correlation value is 0, then, there is no relationship.

From the findings in table 4.2 shows that there is a positive relationship between productivity of commercial banks (measured by cost to income ration) and financial deepening measures in terms of total domestic credit, money supply, and domestic financial savings. The correlation coefficients were 0.463, 0.462 and 0.009 respectively indicating strong relationship between the variables.

4.3 Regression Results

In order to establish the relationship between independent and dependent variables, a multiple regression was conducted. The study conducted a cross-sectional multiple

regression on several determinants over the period 2005 - 2014 and of productivity of the commercial banks in Kenya. The findings were as shown in the table 4.3 below.

Table 4.3: Results of multiple regression between productivity of the commercial banks in Kenya and the combined effect of the selected predictors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873 ^a	.762	.644	5.82769

Source: Research findings.

After performing regression analysis, the study found out that all the coefficients of explanatory variables are statistically significant implying that all the measures of financial deepening affects commercial banks productivity positively. The regression performed indicated a goodness of fit with adjusted R square of 64.4% implying that 64.4% of the deviations of regression from the actual fit are explained by the explanatory variables, while the residuals only explains 35.6%. Therefore, further research should be conducted to investigate the other 35.6% factors influencing productivity of commercial banks in Kenya.

The correlation between the variables is explained by (R=0.873) which shows there is a strong positive correlation between the variables.

Table 4.4: Summary of ANOVA Results Summary of One-Way ANOVA results of the regression analysis between productivity of the commercial banks in Kenya and predictor variables

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	653.628	3	217.876	6.415	.027 ^b
	Residual	203.772	6	33.962		
	Total	857.400	9			

Source: Research findings.

From the ANOVA results in table 4.4 above, the probability value of 0.027, implies that the regression model was significant in predicting the relationship between independent variable and the dependent variable.

The F calculated at 5% Level of significance was 6.415. Since F calculated is greater than the F critical (value = 2.661), this shows that the overall model was insignificant for the study.

Table 4.5: Regression coefficients of the relationship between productivity of the Commercial Banks in Kenya and the three predictive variables

Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
1 (Constant)	77.594	10.661	7.278**	.000
TOTAL DOMESTIC CREDIT KSHS. (MILLION)	-4.745E-5	.000	-1.457	.195
MONEY SUPPLY (M3) KSHS. (MILLION)	2.292E-5	.000	.829	.439
DOMESTIC FINANCIAL SAVINGS KSHS. (MILLION)	1.053E-5	.000	.246	.814

Source: Research findings.

*Significance at 10%, critical value of Z for two-tailed tests is -1.645 and 1.645

**Significance at 5%, critical value of Z for two-tailed tests is -1.96 and 1.96

*Significance at 1%, critical value of Z for two-tailed tests is -2.58 and 2.58

According to the model, all the variables were insignificant as their significance value was less than 0.05 except for the constant. However, credit to private sector was negatively correlated with productivity of the commercial banks in Kenya while money supply and domestic savings were positively correlated with productivity of the commercial banks in Kenya. From the model, taking all factors (credit to private sector, money supply and domestic saving) constant at zero, productivity of the commercial banks in Kenya was 77.594. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in domestic credit leads to 0.000047 decrease in productivity of commercial banks, a unit increase in money supply leads to 0.000023 growth in productivity of commercial banks, and a unit increase in domestic financial savings leads to 0.000011growth in productivity of commercial banks. This infers that money supply contributed most to the productivity

of the commercial banks in Kenya followed by domestic financial savings while the domestic credit had a negative significant effect on the productivity of the commercial banks in Kenya.

4.4 Discussion of Results

From the summary of findings, it is clearly evident that financial deepening had an effect on productivity of commercial banks as indicated by coefficient of determination for the respective years. The study found out that the three independent variables in the study influence commercial bank productivity for the period under study. Total domestic credit negatively influenced productivity of commercial banks.

The findings are in agreement with Sanchez, *et al.*, (2013), who stated that net interest margin associated with advances to private sector was negatively related to all measures of efficiency. Sanchez, *et al.*, (2013), examined the effect of various bank characteristics such as loan loss reserves-to gross loans, equity-to-total assets, net interest margin, return on average assets, return on average equity, overhead cost-to-income ratio, net loans-to-net funds ratio, and the natural logarithm of total assets to proxy size of the banks. The results showed that net interest margin associated with advances to private sector was negatively related to all measures of efficiency, with the exception of revenue allocative efficiency. The study further showed signs of association between efficiency measures and traditional measures of bank performance such as asset quality ratios (loan loss reserves over gross loans), capital ratios (equity over total assets), and operations ratios (ROE, ROA, and cost-to-income ratio).

They also examined the effects of macroeconomic factors on efficiency of Latin American banks. The macroeconomic factors examined were GDP per capita (real 2000 US\$), GDP growth (annual %), inflation from the GDP deflator, real interest rate, gross domestic savings as a percent of GDP, and an interaction variable between the real interest rate and GDP per capita. The study revealed that higher inflation and higher real interest rates negatively affected banking efficiency, whereas levels of savings in a country were positively related to revenue and allocative efficiency. This is in consistence with our findings that domestic financial savings positively affects commercial banks productivity.

Bossone & Lee (2004) also examined the relationship between production efficiency and financial system size. The study was carried out on 875 banks in 75 countries. The data covered 1995-1997. Absolute size of the financial system was measured as a constructed comprehensive indicator for open economies by summing domestic credit, domestic deposits, foreign assets, and foreign liabilities of the banking system, expressed in billions of U.S. dollars. Relative size of the financial system was measured using financial depth. The study found that financial depth was positively related to scale efficiency. This suggests that financial deepening has a positive influence on bank productivity.

However, findings by Chortareas, *et al.*, (2011), revealed that there was a positive relationship between bank productivity change and credit to the private sector to GDP. The authors obtained bank productivity estimates using the non-parametric Malmquist methodology. The data was obtained for 9 Latin American countries for the period 2000-2006 with a total of 973 observations. The dependent variable was total factor productivity while financial deepening was measured using the ratio of credit to the private sector to GDP. The study found strong evidence of causality from financial deepening to bank productivity and also evidence of reverse causality. The results suggested that a virtuous circle between financial deepening and financial institutions' productivity may exist.

4.5 Summary and Interpretation of Findings

From the above regression model, the study found out that there were factors influencing the productivity of commercial banks in Kenya, which are domestic financial savings, money supply and domestic credit. They either influenced it positively or negatively. The study found out that the intercept was 77.594 for all years. The correlation between the variables is explained by ($R=0.873$) which shows there is a strong positive correlation between the variables.

The F calculated at 5% Level of significance was 6.415. Since F calculated is greater than the F critical (value = 2.661), this shows that the overall model was insignificant for the study.

The three independent variables that were studied (domestic financial savings, money supply and domestic credit) explain a substantial 64.4% of productivity of commercial

banks in Kenya as represented by adjusted R² (0.644). This therefore means that the three independent variables contributes 64.4% of the productivity of commercial banks in Kenya while other factors and random variations not studied in this research contributes a measly 35.4% of the productivity of commercial banks in Kenya. The study established that the coefficient for money supply and domestic savings were 0.000023, and 0.000011 respectively meaning that money supply and domestic savings positively and significantly influenced the productivity of commercial banks in Kenya. The study found out that the coefficient of the domestic credit to be negative (-0.000047). This depicts that, according to findings domestic credit negatively influences the productivity of commercial banks in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the discussions from the data findings analyzed and presented in chapter four. Section 5.2 discusses summary of the study; section 5.3 discusses conclusion; section 5.4 discusses limitations of the study and section 5.5 discusses recommendations and areas for further research.

5.2 Summary of the Study

During the past few decades, the Kenyan financial system experienced profound changes, including the liberalization of banking sector, the privatization of financial institutions and the opening of the markets to attract foreign investments. Such reforms during the early 1990s were expected to increase savings and investment in the country and ultimately produce higher growth rates (Aizenman, 2005).

There was need to open up the financial system for the developing economies. In the 1990s the economies were characterized by extensive regulation, administration of interest rates, direct credit programs, weak banking structure, lack of proper risk management systems, and lack of transparency in operations among other factors.

Supporters of development hypothesis theory believe that the lack of a developed financial infrastructure restricts economic growth. Thus, the focus of policy at each point in time should be to ensure that the financial system operates efficiently such that the real sector will receive the necessary support. The acceptance of the hypothesis theory made economic theorists to conclude that a measure of intervention is important and in fact necessary for meaningful growth. On the other hand, the studies by Mckinnon and Shaw (1973) observed that financial repression is correlated with sluggish growth in developing countries. The implication of their studies is that financial development would contribute most significantly to economic growth, if monetary authorities did not interfere in the operations of financial institutions and the financial infrastructure generally.

The study sought to establish the relationship between financial deepening variables and productivity of commercial banks in Kenya. The study used descriptive research design which was appropriate since the study was interested in the state of affairs in

the banking industry without manipulating any variable. The population of the study comprised of 43 active commercial banks in Kenya from which a census approach was taken to collect data from the commercial banks. The secondary data in this analysis covered a period of 10 years (2005– 2014). Data was collected from Central Bank of Kenya, websites of licensed Commercial banks in Kenya, and Kenya National Bureau of Statistics. All the variables on financial deepening and bank productivity of interest namely; advances of commercial banks to private sector, money supply (M3), domestic financial savings, and cost to income ration of banks were obtained using a data collection guide.

From the above regression model, the study found out that there were factors influencing the productivity of commercial banks in Kenya, which are domestic financial savings, money supply and domestic credit. They either influenced it positively or negatively. The study found out that the intercept was 77.594 for all years. The correlation between the variables is explained by ($R=0.873$) which shows there is a strong positive correlation between the variables.

The three independent variables that were studied (domestic financial savings, money supply and domestic credit) explain a substantial 64.4% of productivity of commercial banks in Kenya as represented by adjusted R^2 (0.644). This therefore means that the three independent variables contributes 64.4% of the productivity of commercial banks in Kenya while other factors and random variations not studied in this research contributes a measly 35.4% of the productivity of commercial banks in Kenya. The study established that the coefficient for money supply and domestic savings were 0.000023, and 0.000011 respectively meaning that money supply and domestic savings positively and significantly influenced the productivity of commercial banks in Kenya. The study found out that the coefficient of the domestic credit to be negative (-0.000047). This depicts that, according to findings domestic credit negatively influences the productivity of commercial banks in Kenya.

5.3 Conclusions

The results of this paper present a strong argument towards increasing financial deepening as an important stimulator of greater banking productivity. While the country still exhibits relatively low levels of financial deepening, the latter displays an increasing trend in recent years. The result indicates that the financial reforms undertaken in the last two decades have yielded desired results of improving efficiency in the banking sector. Therefore, an increase in money supply may be an important determinant of further banking productivity increases in the future.

5.4 Limitations to the study

First, availability of relevant and timely data in Kenya was a source of limitation to this study since different sources give distorted data for the same variable. Therefore, to maintain consistency, the study relied on data published by the government press through Kenya National Bureau of Statistics and the Central Bank of Kenya.

Secondly, the study used time series data and therefore is limited to the extent of limitations of time series data. Moreover, the study only focused on commercial bank industry while there are other industries such as insurance and capital markets in the financial sector.

5.5 Recommendations

From the foregoing, it is evident that there is need to sustain a higher level of financial deepening in Kenya. Incidences of non-performing loans should be minimized and private sector credits channeled to the real sector of the economy. Moreover, policy oriented measures should take into consideration the positive causality between financial deepening and bank productivity and try to increase the level of money supply as a stimulant of bank productivity.

5.5.1 Area for Further Research

This study only focused on the effect of financial deepening on productivity of commercial banks, while reverse causality between the two variables was not considered. A more detailed study on reverse causality should therefore be considered.

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APPENDICES

Appendix I: Secondary Data used

YEAR	NO. BANKS	COST: INCOME (%)	TOTAL DOMESTIC CREDIT KSHS. (MILLION)	MONEY SUPPLY (M3) KSHS. (MILLION)	DOMESTIC FINANCIAL SAVINGS KSHS. (MILLION)
2005	41	67.5	529,710	558,164	152,735
2006	41	64.5	600,017	653,036	193,526
2007	41	63	670,771	777,596	282,515
2008	43	56	827,413	901,055	225,238
2009	43	69	978,319	1,045,657	268,558
2010	43	63	998,319	1,271,638	269,553
2011	43	62	1,152,010	1,436,877	160,687
2012	43	51	1,296,451	1,522,210	255,071
2013	42	44	1,529,678	1,741,290	210,599
2014	41	41	1,756,000	1,964,910	215,310

Source: World Bank National Accounts Data and OECD

Appendix II: List of Commercial Banks in Kenya

1. African Banking Corporation Limited
2. Bank of Africa Kenya Ltd
3. Bank of Baroda (K) Ltd.
4. Bank of India
5. Barclays Bank of Kenya Ltd
6. CFC-Stanbic Bank Ltd
7. Charterhouse Finance Bank Ltd
8. Chase Bank Ltd
9. Citibank N.A. Kenya
10. City Finance Bank Ltd
11. Commercial Bank of Africa Ltd
12. Consolidated Bank of Kenya
13. Co-operative Bank of Kenya Ltd
14. Credit Bank
15. Development Bank of Kenya
16. Diamond Trust Bank Ltd
17. Dubai Bank Kenya Ltd
18. Eco Bank Limited
19. Equatorial Commercial Bank
20. Equity Bank
21. Family Bank Ltd
22. Fidelity Commercial Bank Ltd
23. Fina Bank Ltd
24. First Community Bank Ltd
25. Giro Commercial Bank Ltd
26. Guardian Bank Limited
27. Gulf African Bank Limited
28. Habib Bank A.G. Zurich
29. Habib Bank Ltd
30. Imperial Bank Ltd

31. Investment & Mortgages Bank Ltd
32. Kenya Commercial Bank Limited
33. K-Rep Bank Ltd
34. Middle East Bank (K) Ltd
35. National Bank of Kenya Ltd
36. NIC Bank Ltd
37. Oriental Commercial Bank Ltd
38. Paramount Universal Bank Ltd
39. Prime Bank Ltd
40. Southern Credit Banking Corporation Ltd
41. Standard Chartered Bank (K) Ltd
42. Transnational Bank Ltd
43. United Bank of Africa Kenya Bank Limited
44. Victoria Commercial Bank Ltd

Source: CBK Report, 2014