

**EFFECT OF FINTECH FIRMS ON FINANCIAL  
PERFORMANCE OF THE BANKING SECTOR IN KENYA**

**BY:**

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## DECLARATION

I declare that this research proposal is my original work and has not been presented to any other University or college for academic purposes.

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

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## **DEDICATION**

### **My Loving Family.**

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## **ABBREVIATIONS**

CBK	Central Bank of Kenya
FinTech	Financial Technology
KNBS	Kenya National Bureau of Statistics
ROA	Return on Assets

## ABSTRACT

The objective of the study was to determine how and the extent to which the financial performance of the banking sector in Kenya is impacted by the fintech sector. It also aimed at reviewing the increasing body of theoretical and empirical studies that have endeavored to examine the range of magnitude and effects of the fintech sector on the financial performance of Kenyan commercial banks. The study employed a causal research design. The target population was all the licensed forty four commercial banks in Kenya. Secondary sources of data were employed, and data was collected on; the earnings before tax, total assets, the number of registered mobile payment account users, the number of mobile payment transactions, and the value of the transactions. This was a longitudinal study and the unit period of analysis was quarterly. Data was collected for thirty quarters from July 2010 to December 2017. The study applied correlation analysis and multiple linear regression equation with the technique of estimation being Ordinary Least Squares so as to establish the association of the fintech sector and financial performance of commercial banks. When correlation analysis was conducted, the study established that a significant positive association exists between all the predictor variables included in the study and the banks' return on assets with a significance value of 0.000. Before conducting the regression analysis, two variables were dropped because of the presence of multicollinearity. All the predictor variables were significantly correlated. When the regression analysis was done the variable the number of registered mobile payment account users was revealed to have a positive significant relationship with the commercial banks average return on assets. It had a significance value of 0.000 which is greater than the critical value ( $\alpha$ ) of 0.05. It also had a T test value of 5.665 which lies out of range of the two tailed T test critical value of  $\pm 2.04523$ . The coefficient obtained implies that a unit increase in the number of registered mobile payment account users would lead to an increase in commercial bank performance by 1.206. The study concluded that that uptake of mobile payments and the banks' financial performance have a significant positive relationship. Thus, increased uptake of mobile payments leads to increased banks financial performance. The study recommended that the regulator, the Central Bank of Kenya, should recognize the role that fintech plays in the economy and try to incorporate it in the financial system and develop a regulatory framework for it. It also recommended that managers in the financial sector should use the study findings to establish a proper link between services offered by the fintech firms and bank specific factors to ensure that banks do not lose market share. Investors can also invest in banks stock as the financial performance will be on an upward trajectory influenced by the fintech sector.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

The effect of fintech firms is beginning to be felt in capital markets and the banking sector. This research seeks to survey their growth and development, effect on structure of the banking sector and strategies of incumbents and future entrants. Fintech businesses exhibit high welfare-enhancing capabilities to individuals and the business community but disruptive to the banking sector whereby regulation should adequately adapt so the outcomes of the new technology are attained without interfering with financial stability. According to the Bank for International Settlement, (2018), while fintech may be understood as the automation of financial services with use of innovative information, the emergence of new business models as a result of utilization of big data has given fintech the capacity to disrupt the traditional financial intermediaries such as banks. Big data could be linked with artificial intelligence (AI) algorithms, deriving value from advanced computing power (for instance cloud computing, mobile hardware and mobile storage through the cloud which facilitates continuous accessibility). The outcomes of the new techniques results in lower costs of financial intermediation and product improvements for the consumers. (KPMG, 2017).

Despite the rapid adaptation of banks into the digital world, fintech competitors are slowly encroaching into their traditional form of business. Vives (2017) says that the new rivals are able to utilize hard information to impede the traditional associations between the bank and the customer based on knowledge gained from bank and customer links. However, many new competitors avoid seeking for banking licenses so as to avoid compliance costs and skim the profitable commerce from the banks. The potential benefits of fintech firms is based on their ability to take advantage of the existing unease towards banks that has been developed by millennials as they offer digital services which attract the youth. Traditional banks are interested in products while the interest of new entrants lies more on customers (Philippon, 2016).

### **1.1.1 Fintech Firms**

KPMG (2017) defines Fintech companies as “those companies using technology to the best advantage and driving disruption within the financial services industry. These companies have a commitment to excellence, superior customer experience and a demonstrated ability to do one thing in a market better than everyone else”. Fintechs’ advancements in the use of digital technology have so far occurred in lending, financial advising, insurance and payment systems. Fintech has enabled these businesses to lower the intermediation costs and increase financial access through broadening financial inclusion. According to Vives (2017), this efficiency is mainly attributed to the role of Fintech in overcoming information asymmetries which is still a big challenge in the banking sector. Furthermore, fintech firms lack legacy technologies to deal with cultures efficient operational designs. This gives them higher innovative capacities than the traditional businesses.

Peer-to-peer (P2P) platforms issue credits without bank interventions to individuals and firms investing in small businesses. These platforms serve borrowers and lenders while others allow lenders to select the borrowers, loans packages and online auctions to issue. Financial Stability Board (2017).

In Kenya, there are various fintech companies offering various services which have penetrated the market offering various services. Communications Authority of Kenya (2018) reported that the following companies registered with them carried out mobile money services, Airtel Networks Ltd, Safaricom Plc, Finserve Africa Ltd, Telkom Kenya Ltd, Mobile Pay Ltd and Sema Mobile Services. Other companies carrying out payment services though not registered with regulators include Cellulant, Jambopay, Pesapal, and others. Companies such as Branch, Tala, Micromobile among others offer mobile lending services to individuals while Musoni, Saidia and Umati Capital loan to business. There are those that offer P2P lending services like Odyssey Capital, and PesaZetu.

### **1.1.2. Financial Performance**

Al-Matari, Al-Swidi and Fadzil (2014) define financial performance as the ability of a firm to achieve the range of set financial goals such as profitability. Financial performance can be described as a measure of the extent to which financial benchmarks of a firm has been achieved or surpassed. It shows the extent to which financial objectives are being accomplished. As outlined by Baba and Nasieku (2016) financial performance show how a company uses assets to generate revenues and thus it gives direction to the stakeholder in their decision making. Nzuve (2016) asserts that the health of the bank industry largely depends on their financial performance which is used to indicate the strengths and weaknesses of individual banks. Moreover,

the government and regulatory agencies are interested on how banks perform for the regulation purposes.

Financial performance examines the factors that directly influence a firm's financial reports and statements (Omondi & Muturi, 2013). The performance of the firm's is the main appraisal tool used by external parties (Demertzis, M., Merler, S., and Wolff, G., 2017). Hence this explains why firm's performance is used as the gauge. The level of attainment of the firm's objectives defines its performance. Financial performance is the results attained from achieving external and internal objectives of a firm (Lin, 2008). Performance has several names, including growth, competitiveness and survival (Nyamita, 2014).

Financial performance can be measured using a number of ratios, for instance, Return on Assets (ROA) and Net Interest Margin (NIM). ROA is a measure that shows the ability of the bank to utilize the available assets to generate profits (Hoenig & Morris, 2012). ROA ratio is calculated by dividing operating profit by total asset which is used for calculating earnings from all company's financial resources. On the other hand, NIM measures the spread of the interest paid out to the bank's lenders, for instance, liability accounts, and the interest income that the banks generates in relation to the value of their assets. The NIM variable can be expressed as the net interest income divided by total earnings assets (Gul et al., 2011).

### **1.1.3. Fintech Firms and Financial Performance**

The role of fintech companies in enhancing financial performance through the use financial digital platforms cannot be underestimated. Fintech companies are using

new technologies to compete in the market with the traditional financial institutions and act as intermediations in financial service delivery. The Kenyan market contains all the necessary circumstances necessary for the growth of Fintech companies and development of financial systems (Klingebiel, 2000). Fintech companies have cost effective operations and thus a competitive edge since they have fewer regulations compared to the traditional banks and are more cost effective which stretches to enhancing the financial performances of the banking sector.

According to Mutua (2013), rapid change in technology in the payments sector, has increased financial inclusion thus changing the trend of undertakings of the traditional banking systems. The untapped financial market by the Kenyan banks is still large, which provides an opportunity for the fintech companies to venture in. Globalization, increasing customer needs and the increasing number of industries in the sector has led to higher levels of competition and market share and for Kenyan banks to enhance financial performance and remain competitive; forming collaborations with fintech companies is mandatory.

#### **1.1.4. Commercial Banks in Kenya**

Kenyan commercial banks are continuously supervised by the Central Bank of Kenya and regulated by the banking act. Kenya's banking sector has undergone significant growth over the past few years in terms of deposits, assets, products offering and profitability. This growth is mainly attributed to the need to create efficiency and convenience in the Kenyan market through alternative banking channels for instance agency banking, internet banking mobile banking and branch network expansion strategy in Kenya and across the East African community and the bank's resilience to



lower their rates preceding the introduction of the Kenya Bank's Reference Rate (KBRR). Banks in Kenya have tried to maintain their margins despite the prevailing environmental rates. The prudential guidelines issued by CBK focuses on formulating and implementing monetary policies aimed at attaining and ensuring stability in the overall price levels, solvency, fostering liquidity and execution of a stable market based financial system. Kenyan commercial banks has done massive restructuring to mitigate against bank failure, as an aspect of financial sector reform, as part of the government divestiture program, to improve performance, to increase their competitiveness, increase the capacity of the banking of the banking sector and to increase the capacity of the banking sector for financial intermediation (Kenya Commercial Bank, 2017).

A collaborative project involving the Central Banks within the South Africa Development Community (SADC) and Eastern and Southern African (ESAF) Banking Supervision Group was implemented to improve Bank Supervision processes such as creation and maintenance of supervisory data, conducting off-site and on-site supervision, licensing banks, enforcement actions and performing risk monitoring. The banking supervision process continue to be conducted based on off-site as well as on-side surveillance, focusing more on risk based supervision. Due to improved technology there has been marked improvement in the accuracy and timeliness of off-site data submitted to the CBK. Risk based supervision was introduced in 2011, but small banks had to be sensitized on the need to possess formal and documented risk management frameworks. Although other commercial banks engage in restructuring as a survival tool, the CBK requires all banks undergoing financial crises to engage in

restructuring so as to reduce costs and increase financial performance (CBK Supervision Annual Report, 2017).

As at 31<sup>st</sup> December 2017, the sector that deals with banking activities was the CBK which regulates the 44 Kenyan commercial banks including 1 mortgage entity (see appendix II), and 7 representative offices of foreign banks. Out of the 44 commercial banks, 30 banks were locally owned comprising of 3 banks with public shareholding and 27 privately owned banks while 14 banks were foreign owned (Bank Supervision Annual Report, 2017).

## **1.2. Research Problem**

True disruption to commercial banks has been triggered by the abrupt and large scale entry of top digital internet firms commonly referred to as Fintech, Demertzis, Merler, and Wolff, (2017). Ideally, companies including Branch, Apple, Google and Amazon are already considered as fintech companies, but have not fully penetrated into the market. They have a higher potential since they are exposed to large amounts of customer data and can easily interface with them on financial services' matters. Fintech lending has been growing steadily and are currently being used by the social media platforms to cross-sell their financial services give more understanding about their customers.

There were about 40 fintech companies as at the end of the year 2017 in Kenya. They provide various services such as making payments/remittances, lending/financing, crowd-funding platforms and other services which were a preserve of the banks. According to a study conducted by PWC (2017), fintechs pose a threat to the banking

sector by taking part of their market share and hence their margins. This is because they serve those who were previously not catered for by banks, the poor and the youth who are not financially stable, business start-ups who have poor credit rating or have no financial history. Fintechs have also given people a chance to manage their finances, as they are able to track their expenses.

Various studies have been conducted regarding effect of fintech on banking at a global level. According to Navaretti et al. (2017) China is one leading economies in the adoption of fintech. Through telecommunication companies, people are able to make deposits which would earn them higher interest as compared to banks as banks have interest rate ceilings. Banks in China had no extensive branch networks, thus fintechs were able to permeate. Vives (2017) says that in the US, loans provided by fintech companies accounts for a third of total loans provided. Buchak et al. (2017) says that the heavy regulations on banks raising capital requirements and legal scrutiny has caused the growth on fintechs and other shadow banks.

In Kenya, Ngigi (2012) concluded that financial innovation in banks was a significant contributor to its profitability. According to Kinuthia (2008), banks are continuously innovating new products but the rate of innovation is determined by the size of the organization, ownership and duration of operation of the bank. Financial innovation has been shown to boost economic growth and enhance financial performance of commercial banks. (CBK, 2011).

No study however, has been carried out in Kenya to establish whether the increasing, unregulated fintech sector is having an impact on the profitability of the banking sector in Kenya. This study therefore addressed this gap.

### **1.3 Research Objective**

To investigate the effect of fintech firms on financial performance of the banking sector in Kenya.

### **1.4 Value of the Study**

The study's findings will make additions to the existing body of knowledge financial performance as confronted by the impact of the introduction of fintech companies as the study variables. The research output will be a source of invaluable literature among the study variables on theories and policies that inform them. Theories such as the financial intermediation theory, theory of innovation diffusion, institutional theory and technology acceptance theory will receive additional incite on the importance of financial intermediation and for organizations to be innovative and adapt to technology in order to be efficient and remain competitive.

The study methodology on stepwise regression will be useful to researchers who might be keen on analyzing complex relationships between the dependent and many independent variables.

This study will make contribution to managerial practice on services offered by commercial banks, banks' specific factors and aligning banks to these aspects and managerial practices. Essentially all managerial practice should get to above average and lead to establishment of a proper link between services offered by the fintech firms and bank specific factors to ensure that banks do not lose market share to the former.

The Central Bank will find the study useful as the regulatory agency might need to recognize the fintech companies as a real reckoning force in the economy and therefore to formulate regulations relating them. This will level the playing ground for both fintechs and the banks in Kenya.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The theoretical review in this chapter discusses the theories of financial intermediation, theory of diffusion of innovation, institutional theory and technology acceptance theory. The empirical review summarises concepts on bank restructuring and financial performance.

#### **2.2 Theoretical Review**

The theories summarized in this section are, the theory of financial intermediation, theory of diffusion of innovation, institutional theory and technology acceptance theory.

##### **2.2.1 Theory of Financial Intermediation**

Financial intermediation is the transfer of funds from economic entities with surplus amounts to those in need of funds. The theory of financial intermediation calls for the existence of financial intermediaries which rely on the existence of asymmetric information, magnified transaction costs, huge monitoring costs and existence of financial sector regulation. The theory relies on the concept of allocation of resources and is based on perfect and complete markets. The theory further suggests that the market has frictions such as information asymmetry and transaction costs that are vital in understanding and appreciating financial intermediation. The information asymmetries lead to market imperfections and most of these imperfections result to particular forms of transaction and monitoring costs (Merton, 1995). Through

screening, financial institutions enable reduction of adverse selection. By putting in place debtor monitoring mechanisms they reduce moral hazard in financial markets.

The theory further contends that asymmetric information between economic units with excess and those with deficits cause imperfections in the financial market.

The second dimension of the theory focuses on costs of effecting transaction. By exploiting economies of scale, financial institutions tend to reduce transaction costs that are incurred when economic units transact directly with each another. The third argument is pegged on the method of regulation that exists to control savings and investments in the economy. Regulation may for example require financial institutions to maintain liquidity levels that exceed the specified thresholds and prescribe specific ratios of deposit to capital (Andries & Cuza, 2009).

The financial intermediation theory is vital in explaining the association between restructuring and attributes of financial institutions commercial banks not excluded. The asymmetric information component of the theory suggests that where financial institutions exists, regulation on provision of information makes it easier for financial market participants to access financial markets information. This also means that lower costs will be incurred in dealing with adverse selection and moral hazard reducing the danger of nonperforming loans and therefore increasing financial performance. The costs of effecting transactions would mean that increase in size, more enhancement of technology and increased managerial competency tend to lead to more financial services offered at lower cost (Merton, 1995). The main critics of the theory contend that a large number of institutions that have issued a variety of different types of securities are necessary for the theory to hold. The existence of

continuous time techniques for option pricing models such as the Black and Scholes model and the extension of the general equilibrium theory of determining prices tend to negate this criticism. Dynamic trading of financial assets in technologically advanced financial markets allows these markets to effectively compete even where a limited number of financial securities and financial institutions exist.

Both the fintechs and the commercial banks provide financial intermediation services. The fintechs have embraced the use of innovation and technology to provide the financial services at cheaper transaction costs, more conveniently and efficiently. They also face much less regulation as compared to commercial banks. This has made them have a more competitive advantage over banks. This study therefore seeks to find what impact this has had in the banking sector in Kenya.

### **2.2.2 Theory of Diffusion of Innovation**

The theory of diffusion of innovation is widely pronounced and was advanced by Rogers (1995). The founder 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). The decision not to embrace an innovation translates to rejection of a viable new idea. However, Rogers suggests different tools that could be used to measure the rate of adoption of innovation such as relative compatibility, advantage complexity; triability and observability. Rogers (1995) further argues these five characteristics influence innovation and are vital in explaining the rate of technology adoption.



Diffusion of technology is a fundamental process whereby the technological potentials of innovative initiatives are transformed to be productive. Different attributes of the economic environment where diffusion occurs could influence the rate of diffusion, while the actual diffusion has feedback mechanisms on the environment. Full understanding of this process involves providing answers to different vital questions such as factors that determine the various rates of diffusion, identification of early technological innovations adopters, factors that dictate the different diffusion rates and the effects of the diffusion on the economic environment.

The present diffusion of Financial Technology (Fintech) offers a good platform to closely examine these questions. If a commercial bank in Kenya observes the importance of technological innovations and possess the tools, they will adopt these innovations. The innovations' adoption will smoothen the financial, operational and portfolio of the given banking institution.

### **2.2.3 The Institutional Theory**

The theory contends that institutions are social structures with norms and expectations which have had to attain a high degree of resilience. Institutions have a wide scope of operations. They exhibit varying levels of jurisdiction, from a systemic world to another with localized interpersonal relationships (Lounsbury, 2008). Institutional theory looks into the deeper attributes of the social structure and takes into consideration the mechanisms through which structures such as schemes, norms, routines and rules become ingrained as the accepted guidelines for social behaviour in organizations (Scott, 2004). Banks undergo restructuring to provide services to

different clients and remain competitive. Restructuring allows organizations to change their structure and form in order to increase their efficiency.

Scott (2004) is of the view that in order to survive in a competitive environment, organisations must comply with the rules and belief systems that exist in the environment, because isomorphic institutions, both as a result of structure or procedures including the goods and services offered by the firm tend to earn the organisation legitimacy. For example, MNCs carrying out business in various countries with different institutional environments tend to face divergent pressures and are expected to use the restructuring approach that takes into account the country circumstances including their ownership structure. The competitive strategy in every economy tends to be influenced by the pressures in the host and domestic institutional environments which tend to exert significant influences in such economies. Knetter (1989) observe that companies in different economies respond differently to the same challenges (Economic, political and social factors) which constitute an environments' institutional structure that confers firms with benefits for engaging in specific duties.

Institutional theory therefore requires firms to be able to conform to their environments. Currently the environment has progressed to the use of mobile phones, which have greatly increased convenience, and cost of doing transactions. There is also available, social media and other internet platforms, which have provided big data that is being used by fintechs to reduce information asymmetry while providing financial services. In order for banks to survive and thrive, they must comply with the current social structure and behaviours in the environment.

## **2.2.4 Technology Acceptance Theory**

The Technology Acceptance theory (TAT) was first proposed by Davis, Bagozzi and Warshaw (1989) to examine the conceptual model of the intention of user or the degree to which information system or new technology has been done. TAT is designed on the basis of perceived ease and usefulness of the new technology. Perceived usefulness of technology implies to a person's belief to enhance the level of job performances through the use of information systems or new technologies. Perceived ease of use of new technology implies how easy an individual learns how to use or operate new information system and technology (Baker et al., 2015). The TAT model has put more stress on the way perceived ease of use of new technology directly affects perceived usefulness of technology. An external variable such as environment factors surrounding an individual intervenes in influencing perceived usefulness and ease of use. Hence, Technology Acceptance Theory has a basis in both crucial perceptive factors that is perceived ease of use and perceived usefulness. Technology Acceptance Theory is applied highly on the researches involving information technology. Liu and Arnett (2000) analyzed the important variables to come up with lucrative website based on TAT model.

Study by Luarn & Lin (2003) combined Technology Acceptance Theory and trust to come up with a new integrated model that explains the behavior of consumer while interacting with technology online. Pavlou (2003) proposed an e-commerce acceptance framework for online consumers by segregating and utilizing experimental designs and survey. Later on, Follow-up researches were carried out by Horst, Kuttschreuter and Gutteling (2007). The researchers deliberated on whether or not the government of Netherlands ought to provide the citizens with electronic platform to

access government services like other countries do. The study adopted TAT factors including perceived risk, faith and the experiences of the public. The results of the empirical study revealed the principle of e-government based on peoples' full trust on the government firms and that citizens highly associate with IT. As a result of the empirical study, researchers found out that Technology Acceptance Theory does not merely explain how users of new technology accepts and adopts the technology but also ensures that Technology Acceptance Theory is suitable for the explaining the behavior of online user' of technology (Pavlou, 2003; Horst et al., 2007).

Technology Acceptance theory is a key theory that underpins the current study on effect fintech firms on performance of listed banks in Kenya. Just like the acceptance and growth of the fintech companies, it's not just enough for banks to come up with innovative technologies for banking but the technologies must be accepted and adopted by the clients of the bank. TAT is designed based on perceived usefulness and ease of use of the new technology. Perceived usefulness of technology implies to a person's belief to enhance the level of job performance via a specific information system or new technology. Perceived ease of use of new technology implies to the ease with which a person learns to use or operate new information system or technology (Baker et al., 2015).

## **2.3 Determinants of Financial Performance**

### **2.3.1 Capital Adequacy**

According to Athanasoglou et al., (2005), capital is a significant variable in determining bank financial performance. Capital is the owner's contribution which supports the bank's activities and acts as a buffer against negative occurrence. In

capital markets that are not perfect, well-capitalized banks must reduce borrowing so as to support a certain index of assets, and as a result of lower prospective bankruptcy costs they tend to face lower funding costs.

A well-capitalized bank has a signalling effect to the market that a performance above average is to be expected. Athanasoglou et al., (2005) realized that capital contributions positively affected bank profitability, which reflects sound financial condition of banks in Greece. Also, Berger et al., (1987) noted positive causality in both direction between capital contributions and profitability in companies.

### **2.3.2 Size**

Bank size determines the extent to which a firm is affected by legal and financial factors. The size of the bank is also closely linked with the capital adequacy because large banks raise less expensive capital and thus generate huge profits. Bank size has a positive correlation with the return on assets indicating that large banks can achieve economies of scales that reduce operational cost and hence help banks to improve their financial performance (Amato & Burson, 2007). Magweva and Marime (2016) link bank size to capital ratios claiming that they are positively related to each other suggesting that as the size increases profitability rises.

The amount of assets owned by an organization determine its size (Amato & Burson, 2007). It is argued that large firms have adequate resources to undertake a number of large projects with better returns than firms with small amounts of total assets. In addition, firms with large amounts of total assets have adequate collateral which they can pledge to access credit and other debt facilities compared to their smaller

counterparts (Njoroge, 2014). Lee (2009) established that the total assets controlled by a firm as measured by the total assets have an influence on the level of profitability recorded from one year to another.

### **2.3.3 Bank Liquidity**

Liquidity is defined as the degree in which an entity is able to honor debt obligations falling due in the next twelve months through cash or cash equivalents for example assets that are short term can be quickly converted into cash. Liquidity results from the managers' ability to fulfill their commitments that fall due to policy holders as well as other creditors without having to increase profits from activities such as underwriting and investment and as well as their ability to liquidate financial assets. (Adam & Buckle, 2003)

According to Liargovas and Skandalis (2008), liquid assets can be used by firms for purposes of financing their activities and investments in instances where the external finance is not forthcoming.). Firms with higher liquidity are able to deal with unexpected or unforeseen contingencies as well as cope with its obligations that fall due in periods of low earnings. Almajali et al., (2012) noted that firm's liquidity may have significant effect on insurance companies' financial performance; therefore he suggested that insurance companies should aim at increasing their current assets while decreasing their current liabilities. However, Jovanic (1982) noted that an abundance of liquidity may at times result to more harm. He therefore concludes that the effect of liquidity on financial performance of firms is ambiguous.

### **2.3.4 Macro-Economic Variables**

Macroeconomic variables impact on financial performance of commercial banks and especially on bank risk has been of great importance to policy makers. Using GDP growth to control cyclical output effects, which are likely to positively influence the profitability of banks, as the rate of growth in the GDP declines, more especially during recession, banks experience negative returns caused by the lowering of credit quality and increases in defaults (Flamini et al., 2009).

Macroeconomic variables that impact on the performance of banks include legislative laws, inflation rate, interest rate and economic growth level measured using Gross Domestic Product (GDP). Athanasoglou et al., (2005) argues that the GDP trend influences the demand for bank's assets. A decline in the GDP growth reduces the credit demand which has a negative impact on the banks' profitability. Additionally, a growing economy with positive GDP growth has a high depending on the prevailing business cycle. There is high demand for credit during boom as opposed to recession.

## **2.4 Empirical Review**

Studies in this section focus on bank restructuring and financial performance. Osoro (2014) carried out a study on the impact of restructuring financial systems on the financial performance of Kenyan commercial banks. The research focused on 11 commercial banks quoted at the NSE and were in business for the period 2008 to 2013. Debt ratio, equity ratio and dividend payout were used to measure financial restructuring. The study relied on multiple linear regression to analyze the data. The findings were that a financial restructuring has a positive impact on Kenyan

commercial bank's financial performance. The effect was however not significant as it explained only 26.7% of the financial performance.

A study by Ithiri (2013) examined corporate restructuring and impact on the performance on Kenya Commercial Bank performance. The study employed a descriptive approach. The sample was 100 respondents selected from the commercial banks. A structured questionnaire was used to collect data which was analyzed using descriptive statistics. The findings of the research identified competition, budgetary cuts, new company strategy, change in government policy and public pressure as the main drivers of restructuring.

Beck, Demirguc-Kunt and Peria (2006) investigate the barriers to accessing banks financial services using data from 193 institutions which carried out banking business activities in 58 countries. The study used primary data and indicators of access to banks used were deposit, credit and payments. The revelation was that bank size and physical infrastructure predict barriers in a robust manner. The role of microfinance institutions in access to financial services was however not researched on particularly among the low income earners. Bonin et. al. (2004) investigated whether the privatization programmes of banks in transition economies have an effect on financial performance of these banks. By taking the largest banks in six highly advanced countries, including, Bulgaria, the Czech Republic, Hungary, Croatia, Romania and Poland the findings were that income and balance sheet attributes were comparable across the four types of bank ownership. Stochastic frontiers were used to compute efficiency measures which were used in privatization and ownership regressions had dummy variables as per the bank type. The empirical findings accept the hypotheses



that government-owned banks are least efficient while the foreign-owned banks are most efficient.

Honohan and King (2009) examined the impact firm factors which are as size (capitalisation and total assets), ownership, profitability, access to financial services and years in banking. The bank's capacity to access financial services was measured by counting the number of branches situated at the outskirts major urban towns. Duration in the banking business was computed by counting the years in operation since the bank was licensed, the profits of the bank after tax adjustments on extraordinary items were used to measure profitability, ownership was categorized as either foreign or local, while the firm's total assets was used to measure firm size . Regression output revealed that the most significant determinant of access to financial services is firm size. This study did not investigate the contribution made by multinational banks in access to financial services both at the local and the international level.

Studies by Barako et, al. (2013) explored the of specific firm factors and the modes used by the Kenyan commercial banks to access financial services. The dependent variable was access to financial services as measured by bank branches while the independent variables were firm factors such as profitability, years in business, size and ownership. The results revealed the firm specific factors including capitalisation as having a strong and positive relationship with financial services' access. The study did not however relate the ability to access to financial services to the amount of deposits and the size of customer loans.

Al-Obaidan (2008) observe that the most important characteristics of banks owned by the state, whether agricultural, hybrid or industrial are their dependence on external donors and government for resources at reasonable interest rates, larger subsidy offerings than private banks, political pressure to lend non-creditworthy and risky borrowers and offer of narrow range of financial services . An economy that has few public banks relies majorly on private capital focusing more on ensuring that services are accessed by the majority of the citizens.

Gianetti and Ongena (2009) studied the impact of positive growth implications of financial integration on small and young firms. Panel data of 60,000 annual observations of firms quoted and non-listed in Eastern European countries was used to establish the effect of differences of foreign bank lending on firm financing and growth. Foreign lending was found to stimulate growth in sales of the firm, assets owned, and utilization of financial debt despite the fact that the effect is favorable for smaller establishments. To be more articulate young firms tend to benefit more from presence of foreign banks while entities linked to domestic banks or government suffer. Overall, research output suggests that foreign banks do give assistance in mitigation to curb connected-lending predicaments and improvement in capital allocation.

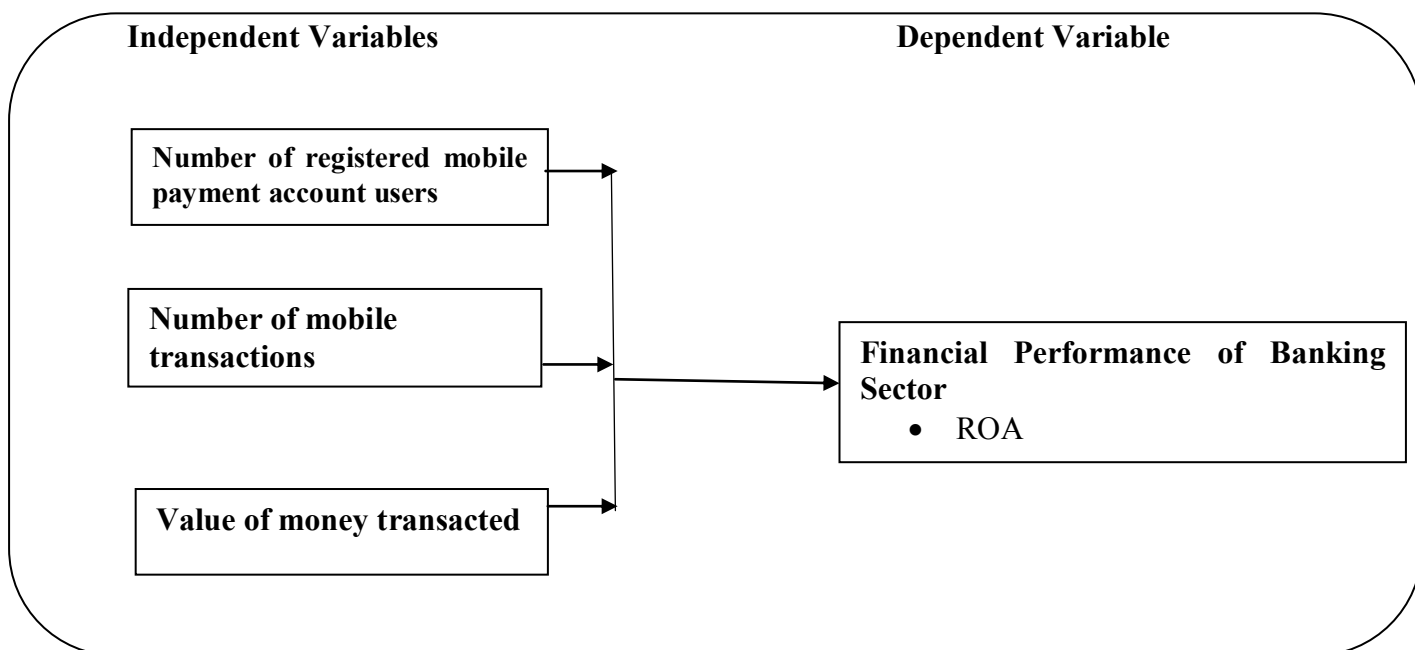
Yildirim (2013) looks at different firm characteristics that influence credit access by sampling 970 SMEs that executed businesses across nine provinces of South East Anatolia and Mediterranean and zones in Turkey. The findings revealed that size of assets, stability and volume of sales, legal form and export rate are fundamental determinants of bank services and products that provide satisfaction. These findings

agree with the hypothesis that bigger firms with huge and stable sales having a higher capacity to access financial services and thus receive more benefits from credit services extended to their local.

## 2.5 Conceptual Framework

To attain the objectives of the study, different variables under study can be conceptualized as being in association as presented in Figure 2.1 below.

Figure 2.1: Conceptual Framework



Source: Researcher (2018)

## 2.6 Summary of Literature Review

Researches in many countries reveal that countries that were more successful in taking note of solvency problems than aspects of profitability were more profitable (IMF, 2013). Whereas bank solvency emanates majorly from shorter-term financial

restructuring, profitability returns require more difficult, longer-term operational restructuring. Dziobek and Pazarbarsioglu (1998) observe that in practice, bank restructuring programme designs are often somehow unbalanced, laying more emphasize on financial restructuring measures instead of operational restructuring measures.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This section describes the research methodology that was employed in the study. A detailed research design, study population, methods of collecting data, reliability and validity of the research instruments and data analysis techniques is presented.

#### **3.2 Research Design**

A research design can be defined as the blue print for executing a study with full control over factors that have an effect on the validity of the findings. Research designs are either experimental or non-experimental. This study will rely on descriptive research design. The research design that was preferred for this study is causal research design as it had hypotheses that are clearly stated (Cooper & Schindler, 2003) and sought to establish the cause and effect relationship between two or more variables.

#### **3.3 Population**

Cooper and Schindler (2003) describe a population as an entire group of individuals, happenings or objects having common characteristics that conform to a given specification. This research was a census of all the 44 entities carrying out banking business sector in Kenya. As at 31<sup>st</sup> December 2017, there were 44 commercial banks registered under the banking act and 1 mortgage company (Appendix II).

### **3.4 Data Collection**

This study will use secondary data for the period July 2010 to December 2017, the unit of analysis is quarterly. Data was obtained from economic surveys published by Kenya National Bureau of Statistics (KNBS), the financial inclusion report and banking supervision and banking sector reports published by CBK and the national payments systems statistics reported by the central bank.

### **3.5 Data Analysis**

The data collected was examined before analysis commenced for completeness and consistency. The longitudinal data was entered into SPSS version 21. The longitudinal data was then analysed using descriptive statistics, correlation analysis, and multiple regression analysis. Descriptive statistics such as dispersion and measures of central tendency were used. Inferential statistics included bivariate Pearson correlation and multiple linear regression. The results were presented in tables with their associated explanations.

#### **3.5.1 Analytical Model**

The empirical model indicated in the subsequent page states the relationship between study variables. The regression analysis model facilitated the analysis of the data in this study. The dependent variable was consolidated ROA of the entire banking sector in Kenya while the independent variable were the mobile money transactions facilitated by Fintech firms.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \dots\dots\dots 1$$

Where:

$Y$  is the average return on assets of the banking sector in Kenya at  $t$ .

$X_1$  is the number of registered mobile payment account users in quarter<sub>1-n</sub>

$X_2$  is the number of mobile transactions measured in quarter<sub>1-n</sub>

$X_3$  is the value of money transacted during quarter<sub>1-n</sub>

$\beta_0$  is the constant term,

$\beta_1, \beta_2, \beta_3$  are the regression coefficients

$\varepsilon$  is the error term.

Period ( $t$ ) is quarterly, from July 2010 – December 2017

## **CHAPTER FOUR**

### **DATA ANALYSIS, RESULTS AND DISCUSSIONS**

#### **4.1 Introduction**

In this chapter, a presentation, interpretation and findings' discussion are undertaken. The chapter will be divided into four sections. It will include; descriptive statistics, correlation analysis statistics, regression analysis, and the interpretation and discussion of findings.

The study analysed the impact of the fintech sector on financial performance of Kenya's banking sector. The study was conducted for a period of thirty quarters, from July 2010 to December 2017. Data on income before tax, total assets, the number of registered mobile payment account users, the number of mobile payment transactions, and the value of the transactions was obtained from the CBK publications available on their website, mainly the bank supervision reports and bank development reports. The values of ROA were seasonally adjusted which were obtained from the quarterly banking development reports.

#### **4.2 Descriptive Statistics**

Descriptive statistics was undertaken to establish the frequency of occurrence of individual subjects or a collection of instruments so as to establish their associations. It provides a variety of variables such as approximating the objectives and defining the set of attributes exhibited by the population. The descriptive research aided the generalization of this study's findings.

##### **Table 4.1: Descriptive Statistics**



	<b>ROA</b>	<b>Accounts (millions)</b>	<b>Transactions (millions)</b>	<b>Value (KSh billions)</b>
<b>N STATISTIC</b>	30	30	30	30
<b>MINIMUM STATISTIC</b>	0.008	15.2239	83.184	191.81
<b>MAXIMUM STATISTIC</b>	0.033	37.3868	405.87	930.597
<b>MEDIAN STATISTIC</b>	0.01168	25.50825	213.6493	559.338
<b>MEAN STATISTIC</b>	0.014606	25.4625	227.211	573.5577
<b>STANDARD DEVIATION</b>	0.007603	6.291632	100.932	235.5776
<b>SKEWNESS</b>	1.60864	0.261383	0.257151	0.051661
<b>KURTOSIS</b>	0.978466	-0.96202	-1.19327	-1.29166

From the findings in Table 4.1 above, the highest value for Return on Assets (ROA) is 3.3% while the lowest value is 0.08%. The following measures of central tendency were exhibited; a mean of 1.4606, and a median of 1.168%. Also, the value of the standard deviation depicts variability in the stock returns of  $\pm 0.7603\%$ . A data series is normally distributed if its skewness statistic lies in the range of -0.8 to +0.8 and its kurtosis statistic lies within the range of -3 to +3. Though the skewness of the ROA data series has a skewness statistic that lies slightly out of the prescribed range, its kurtosis statistic lies intact within the prescribed range. In cases of conflict of the skewness and kurtosis statistics, the kurtosis statistic is preferred over skewness statistic. Thus the ROA data series is normally distributed.

From the findings, the highest value for the number of registered mobile payment account users is 37.39 million while the lowest value is 15.224 million. The following measures of central tendency were exhibited; a mean of 25.46 million and a median of 25.51 million. The data in the series exhibits normal distribution because its skewness lies within the range of -0.8 to +0.8 and the kurtosis lies within the range -3 to +3. In addition, the value of the standard deviation depicts variability in the variable of  $\pm 6.29$  million.

Further results from the findings indicate that the highest value of the number of mobile payment transactions quick ratio is 405.87 million while the lowest value is 83.18 million. The following measures of central tendency were exhibited; a mean of 227.21 million, and a median of 213.65. In addition, the value of the standard deviation depicts variability in the variable of  $\pm 100.93$ . The data in the series exhibits a normal distribution because it has skewness that is within the range of -0.8 to +0.8, and a kurtosis within the range of -3 to +3.

The final results from the findings point out that the highest value of the value of mobile payment transactions is 930.6 billion while the lowest value is 191.98 billion. The following measures of central tendency were exhibited; a mean of 573.56 billion, and a median of 559.34 billion. Also, the value of the standard deviation depicts variability in the variable of  $\pm 235.58$  billion. The data in the series has a normal distribution because it has skewness that lies within the range of -0.8 to +0.8, and a kurtosis within the range of -3 to +3.

### 4.3 Correlation Analysis

Correlation analysis is was undertaken to explore the association between two variables that lie between perfect (+) perfect positive correlation and (-) strong negative correlation . Pearson correlation was employed to analyse the level of association between firm performance and liquidity, as well as the association between firm performance and the control variables. The study employed a Confidence Interval of 95%, as it is the most utilized in social sciences. A two tailed test was utilized.

**Table 4.2: Correlation Analysis**

		ROA	Accounts	Transactions	Value
ROA	Pearson Correlation	1	.731**	.661**	.638**
	Sig. (2-tailed)		.000	.000	.000
	N	30	30	30	30
Accounts	Pearson Correlation	.731**	1	.985**	.979**
	Sig. (2-tailed)	.000		.000	.000
	N	30	30	30	30
Transactions	Pearson Correlation	.661**	.985**	1	.995**
	Sig. (2-tailed)	.000	.000		.000
	N	30	30	30	30
Value	Pearson Correlation	.638**	.979**	.995**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	30	30	30	30

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The study findings in Table 4.2 in the preceding page indicate that ROA is significantly correlated at the 1% significance level (hence, consequently also significant at the 5% significant level) to all the predictor variables included in the

study. The findings imply that there is a positive relationship between each predictor variable and ROA.

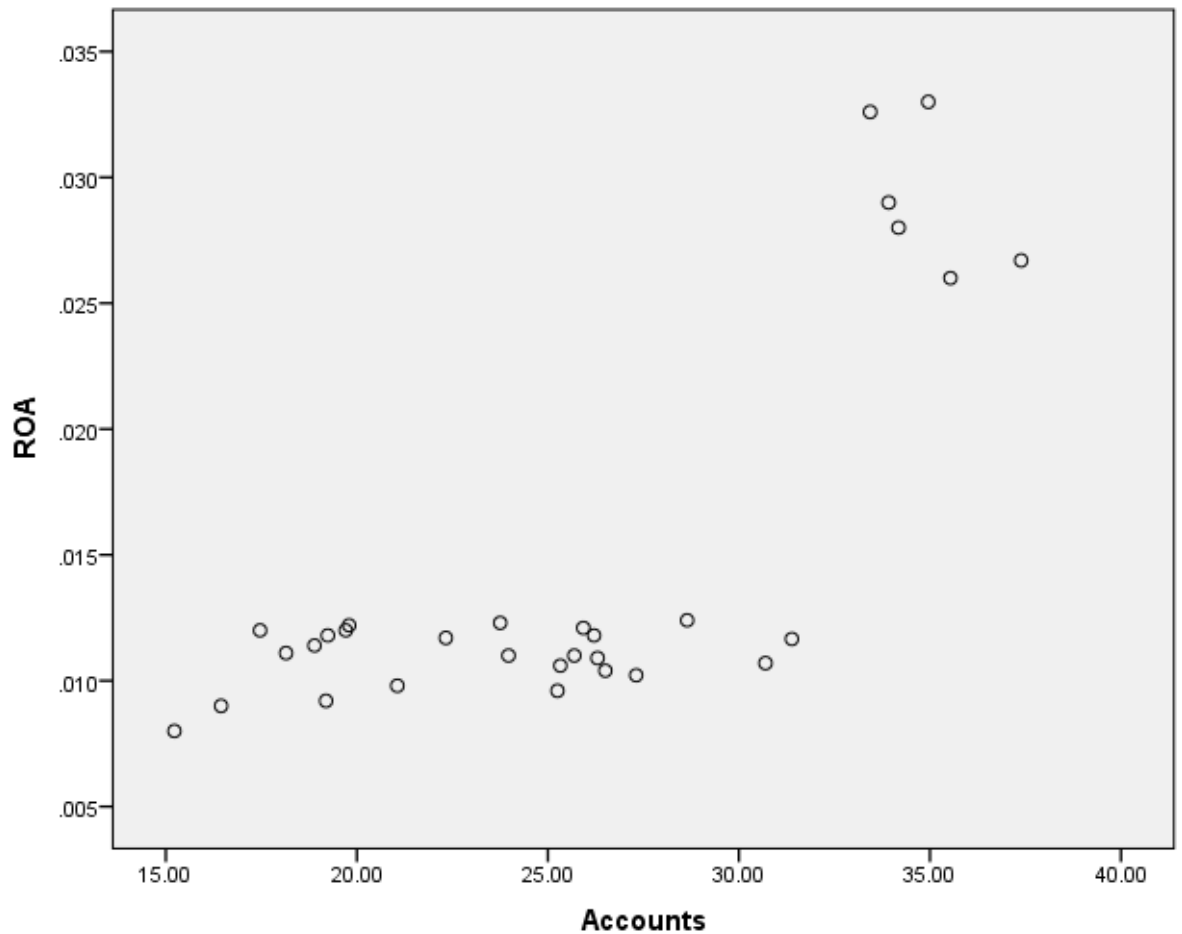
The significant correlation at the 5% significant level between all the predictor variables indicates presence of multicollinearity. Multicollinearity is a statistical phenomenon in which there exists a perfect or exact relationship between the predictor variables. Thus, it will result in incorrect conclusions about the relationship between outcome variable and predictor variables. Since all the predictor variables are significantly correlated at the 5% level of significance, one variable can be retained and the other two discarded since it implies redundancy.

#### **4.4 Regression Analysis**

The ROA was regressed against the predictor variable number of registered mobile payment account users using simple linear regression. The rest of the predictor variables were discarded because of the existence of the condition of multicollinearity between them.

A test to determine linearity was first introduced because linearity is a pre-condition to running a regression on a model. Linearity is present when the conditions of normality and homoscedasticity are met. The test of normality was conducted through the skewness and kurtosis statistics in Table 4.1. Homoscedasticity was conducted by use of a scatter plot diagram. For the data series number of registered mobile payment account users, the results are exhibited in Figure 4.1 below.

**Figure 4.1: Accounts Scatter Plot**



Majority of the plotted points are clustered together and a line of best fit can be drawn to join them. Thus, this indicates a condition of homoscedasticity. The data series number of registered mobile payment account users exhibited a normal distribution as revealed by the skewness and kurtosis statistics in Table 4.1 and exhibits homoscedasticity as indicated in Figure 1.

With the conditions of normality and homoscedasticity being met, it is evident that the data series is linearly related to the response variable, ROA and thus regression could be run on the model. The regression analysis was undertaken at 5% significance level.

The critical value obtained from the significance level, F test, and T test were compared with the values obtained in the analysis.

**Table 4.3: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.731 <sup>a</sup>	.534	.517	.12503	.585

a. Predictors: (Constant), Accounts

b. Dependent Variable: ROA

R square, being the coefficient of determination indicates the deviations in the response variable that is as a result of changes in the predictor variables. From the outcome in Table 4.3 above, the value of R square was 0.534, a discovery that 53.4% of the deviations in ROA is explained by the variable number of registered mobile payment account users. Other variables not included in the model justify for 46.6% of the variations in the financial performance of commercial banks.

To test for autocorrelation, Durbin-Watson statistic was applied which gave an output of 0.585 as displayed in Table 4.3 above. A rule of thumb is that test statistic values in the range of 1.5 to 2.5 are relatively normal. Values outside of this range could be cause for concern. Field (2009) however, suggests that values under 1 or more than 3 are a definite cause for concern. Therefore, the data used in this panel is serially autocorrelated because it meets this threshold.

**Table 4.4: Analysis of Variance**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	.502	1	.502	32.091	.000 <sup>a</sup>
Residual	.438	28	.016		
Total	.939	29			

a. Dependent Variable: ROA

b. Predictors: (Constant), Accounts

A model is significant if the significance value obtained from the study findings the significance value is less than the critical value of 0.05 or the F value obtained is greater than the critical value obtained from the F test tables. The critical value obtained from the F test tables was 2.97515399. The study indicates a significance value of 0.000, which is less than the critical value. The study also gives an F value of 32.091, which is less than the critical value. This implies that the model is statistically significant in predicting how the adoption of mobile payments affects the financial performance of commercial banks in Kenya.

**Table 4.5: Model Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-3.558	.298		-11.960	.000	-4.167	-2.949
Accounts	1.206	.213	.731	5.665	.000	.770	1.643

a. Dependent Variable: ROA

The Coefficients are used as an indicator of the magnitude and direction of the relationship between the independent variables and the response variable. The

significance and T values are used to establish the significance of the relationship of the independent variable to the dependent variable. The values obtained are contrasted to the critical values. A confidence interval of 95% was utilised and hence, a significance value of less than critical value 0.05 is interpreted as a measure of statistical significance. As such, a significance value above 0.05 indicates a statistically insignificant relationship between the dependent and the independent variables. The two tailed T test critical value of  $\pm 2.04523$  was obtained from the T test tables. A T test value that lies out of this range is significant.

From the results contained in Table 4.5 above, it is evident that the predictor variable number of registered mobile payment account users has a statistically significant relationship at the 5% level of significance with ROA. It has a significance value which is less than the critical value of 0.05 and a T value of 5.665 which lies out of the range of the critical value. The model coefficient indicates it as a positive relationship with ROA. The regression equation in the subsequent page was thus estimated:

$$Y = -3.558 + 1.206X_1$$

Where;

Y = The Average Return on Assets of the Banking Sector in Kenya at t.

X<sub>1</sub> = The Number of Registered Mobile Payment Account Users in Quarter<sub>1-n</sub>

#### **4.5 Interpretation and Discussion of Findings**

The study specifically sought to establish how the fintech sector impacts on financial



performance of the banking sector in Kenya. The effect of the independent variable retained in the study on the dependent variable was analysed in terms of strength and direction.

The descriptive statistics in Tables 4.1 reveal that the response and all the predictor variables have a normal distribution. This is indicated by their medians being close to their means, and also by the skewness and kurtosis statistics. We can also deduce that the variables have had a huge change, this is indicated by their range, which is the difference between the maximum and minimum statistic and also by their standard deviations. The research data attached in Appendix III corroborates that there has been a huge uptake of the mobile payment services by the Kenyan populace. This indicates that the mobile payment has been designed on the basis of perceived ease and usefulness technology as suggested by Davis, Bagozzi and Warshaw's (1989) Technology Acceptance Theory (TAT).

Despite the competition from fintech firms, commercial banks' financial performance has been on the increase as indicated by the data in Appendix III. This implies that the banks have embarked on restructuring strategies as suggested by findings by Osoro (2014) and Ithiri (2013) that financial restructuring has a positive impact on Kenyan commercial bank's financial performance. It could also signify innovation in the banking industry as concluded on the study by Ngigi (2012) that financial innovation in banks was a significant contributor to its profitability.

In the test for correlation in Table 4.2, it indicates that there is a significant correlation at the 5% significance level of commercial banks' performance to the predictor variables employed in the study denoting uptake of mobile phone payment

technology. The findings imply that there is a positive relationship between each predictor variable and the response variable. The findings from the correlation matrix that the three predictor variables employed in the study exhibit multicollinearity indicates the three attributes of mobile payment uptake the variables denote the same phenomena, uptake of mobile phone payments and they serve the same purpose.

In the regression analysis, the analysis of variance where only the retained predictor variables was included in the model whose results are contained in Table 4.4 shows that the model developed is significant as evidenced by the F and P values obtained when compared to the critical values. Thus, the model can be used to predict future financial performance of commercial banks.

The model coefficients in Table 4.5 exhibits that the variable number of registered mobile payment account users has a positive significant relationship at the 5% significance level to ROA. This implies that uptake of mobile payments has positive effect on commercial banks performance. The model developed implies that; the constant -3.558 shows that if the predictor variable had a zero value, the dependent variable would equal to the value exhibited by the constant. The predictor variable's number of registered mobile payment account users coefficient shows that a unit increase in the predictor variable would lead to an increase in the response variable by 1.206.

The study findings with studies by resonate with those of the study conducted by Barako et, al. (2013) which found the firm specific factors including capitalisation as having a strong and positive relationship with financial services' access. Thus banks

are not losing their foothold as the dominant financial services provider. It also agrees with studies by Ithiri (2013), Osoro (2014), and Ngigi (2012) that financial restructuring and innovation have a positive impact on Kenyan commercial bank's financial performance. These factors maybe enhanced by competitive pressures from fintech entrants into the financial market.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

#### **5.1 Introduction**

This section looks at the summary of findings, conclusions, recommendations, limitations, suggestions for further research.

#### **5.2 Summary**

This study aimed at determining the effect of the fintech sector on financial performance of the banking sector in Kenya. The unit period of analysis was quarterly, and data was collected for the period from July 2010 to December 2017. Secondary data was collected on; profit before tax, total assets, the number of registered mobile payment account users, the number of mobile payment transactions, and the value of the transactions. The study employed the use correlation analysis and regression analysis to determine the effect of liquidity on firm performance.

The study established in the correlation analysis that the effect of the variables denoting the uptake of mobile payment solutions exhibit a positive significant relationship between each variable and financial performance of the commercial banks. Due to the presence of multicollinearity of all the independent variables, one was picked because inclusion of all of them signified redundancy. When the regression was conducted on the model consisting of the retained predictor variable only, it exhibited a significant positive relationship with commercial banks financial performance.

### **5.3 Conclusion**

From the above findings, it can be concluded that certainly, uptake of mobile payment and Kenyan commercial banks financial performance have a significant relationship. Globalization, increasing customer needs and the increasing number of industries in the sector has led to higher levels of competition and market share and for Kenyan banks to enhance financial performance and remain competitive; forming collaborations with fintech companies is mandatory (Mutua, 2013).

### **5.4 Recommendations**

The banking sector is very crucial to an economy since it allocates limited resources from surplus units to deficit units. Policy recommendations are that the Central Bank, which is the financial sector regulatory agency should recognize that fintech companies increasingly play a major role in the economy and should therefore formulate regulations relating to them.

Liquidity has been established to have a significant positive influence on performance of firms quoted at the NSE, the government through its various arms can formulate rules, regulations and policy that revitalize financial performance of agricultural firms. The firms can re-invest the excess profits by expanding their scope and in the process employing more individuals. They can also give back to the society by conducting Corporate Social Responsibility (CSR) activities.

Recommendations can also be given to the management of the financial institutions where they can enhance contribution to managerial practice on services offered by commercial banks, banks' specific factors and aligning banks to these aspects and managerial practices. Essentially all managerial practice should get to above average

and lead to establishment of a proper link between services offered by the fintech firms and bank specific factors to ensure that banks do not lose market share to the former.

Recommendations can also be made to investment banks, stock brokerage firms, institutional investors, and individual investors, to enable them 'beat the market' and make above average market returns. They can achieve this by investing in the commercial bank stock as its financial performance is increasing with the advent of the fintech firms.

### **5.5 Limitations of the Study**

Due to time and cost limitations, the scope of the study has been limited to thirty quarters, from July 2010 to December 2017. Thus, it has not been determined if the result findings would hold for a longer time period. Furthermore, it is uncertain whether similar findings would result beyond 2017. Since the study employed secondary sources of data, some of this data was not readily available, and it took great lengths to obtain it. Most of the data obtained could also not be used in its raw form, for instance return on assets, and the ratios had to be calculated. Thus, delays were imminent as data was to be edited and processed further before the researcher could be able to compile it. Fintech firms also offer lending and other services but this information was not readily available for analysis from credible sources like Central Banks as they are not regulated.

## **5.6 Recommendations for Further Research**

The study findings contribute to the pool of knowledge available on the influence of the fintech sector on financial performance of the banking sector. The findings also serve to offer strength and/or criticism to existing theories. This study is therefore useful to scholars and academicians since from it they can draw citation. The findings of this study can also be used as foundation for future research by scholars and from them can be drawn a niche for further researches.

The study settled on the following recommendations, First, there are many variables impacting financial performance, apart from the fintech sector. Further research can be done to identify these factors. The current study's scope was limited to thirty quarters, further research can be done beyond this time period to ascertain if the findings would hold. Thus, future studies may use a range of many years, for instance, from the advent of mobile payment solutions in 2006 to date and this can be helpful to disapprove or confirm the study's findings. Researchers in other East African, African, and other global countries can conduct the study on impact of the fintech sector on financial performance of commercial banks in these jurisdictions to ascertain whether the current study findings would hold.

Secondary data was solely utilized in the study, alternative research can be employed using primary sources of data like in-depth questionnaires and structured interviews to be administered key personnel in the commercial banks. These can then approve or disapprove the current study findings. Linear regression and correlation analysis were

used in this research, further studies can incorporate other analysis methods like factor analysis, cluster analysis, and discriminant analysis



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## APPENDICES

### Appendix I: List of Commercial Banks in Kenya

1. Equity Bank Ltd
2. Kenya Commercial Bank Ltd
3. Standard Chartered Bank (K) Ltd
4. Barclays Bank of Kenya Ltd
5. Co-operative Bank of Kenya Ltd
6. CFC Stanbic Bank (K) Ltd
7. I & M Bank Ltd
8. Diamond Trust Bank (K) Ltd
9. NIC Bank Ltd
10. Citibank N.A. Kenya
11. Commercial Bank of Africa Ltd
12. Bank of Baroda (K) Ltd
13. Imperial Bank Ltd
14. Chase Bank Ltd/Currently SBM Bank
15. Prime Bank Ltd
16. National Bank of Kenya Ltd
17. Family Bank Ltd
18. Bank of India
19. Bank Of Africa (K) Ltd
20. Victoria Commercial Bank Ltd
21. African Banking Corporation Ltd
22. K-Rep Bank Ltd
23. Habib Bank Ltd
24. Habib Bank A.G. Zurich
25. Gulf-Africa Bank Ltd
26. Guaranty Trust Bank Ltd
27. Guardian Bank Ltd
28. Giro Commercial Bank Ltd
29. Fidelity Commercial Bank Ltd
30. Development Bank of Kenya Ltd
31. Trans-National Bank Ltd
32. First Community Bank Ltd
33. Oriental Commercial Bank Ltd
34. Equatorial Commercial Bank Ltd
35. Paramount Universal Bank Ltd
36. Jamii Bora Bank Ltd
37. Middle East Bank (K) Ltd
38. Credit Bank Ltd
39. Dubai Bank Ltd
40. Charterhouse Bank Ltd
41. Consolidated Bank of Kenya Ltd
42. UBA Kenya Ltd
43. Ecobank Kenya Ltd
44. Housing Finance Company of Kenya Ltd

**Source: Central Bank of Kenya Annual Bank Supervision Report.**

## Appendix II: Data Collection Form

<b>Year</b>	<b>Quarter</b>	<b>Number of registered mobile payment account users</b>	<b>Number of mobile transactions</b>	<b>Value of money transacted</b>	<b>Return on Assets</b>

### Appendix III: Research Data

<b>Year</b>	<b>Quarter</b>	<b>ROA</b>	<b>Accounts (millions)</b>	<b>Transactions (millions)</b>	<b>Value (KSh billions)</b>
<b>2010</b>	<b>Q3</b>	0.008	15.2239	83.184	191.81
	<b>Q4</b>	0.009	16.4463	90.4755	217.9328
<b>2011</b>	<b>Q1</b>	0.012	17.4653	89.481	240.766
	<b>Q2</b>	0.0111	18.1469	103.5933	273.1038
	<b>Q3</b>	0.0114	18.8916	116.4895	315.7494
	<b>Q4</b>	0.0092	19.191	123.4344	339.531
<b>2012</b>	<b>Q1</b>	0.0118	19.2393	127.7824	356.844
	<b>Q2</b>	0.0122	19.7956	140.1918	369.783
	<b>Q3</b>	0.012	19.71	147.99	391.35
	<b>Q4</b>	0.0098	21.06	161.41	426.83
<b>2013</b>	<b>Q1</b>	0.0117	22.3292	159.27	418.225
	<b>Q2</b>	0.0123	23.75	176.3693	453.879
	<b>Q3</b>	0.011	23.97	190.85	496.45
	<b>Q4</b>	0.0106	25.3263	206.1078	533.005
<b>2014</b>	<b>Q1</b>	0.0118	26.208	206.627	543.97
	<b>Q2</b>	0.0121	25.9284	220.6715	574.706
	<b>Q3</b>	0.0109	26.2995	234.5386	614.053
	<b>Q4</b>	0.0096	25.2492	249.498	639.065
<b>2015</b>	<b>Q1</b>	0.011	25.6902	252.7416	650.508
	<b>Q2</b>	0.0104	26.5028	265.4766	671.819
	<b>Q3</b>	0.01022	27.312	284.4385	734.524
	<b>Q4</b>	0.0124	28.6447	311.52	759.248
<b>2016</b>	<b>Q1</b>	0.0107	30.696	304.358	773.142



	<b>Q2</b>	0.01166	31.386	319.669	818.733
	<b>Q3</b>	0.0326	33.435	337.256	863.138
	<b>Q4</b>	0.033	34.957	369.731	900.092
<b>2017</b>	<b>Q1</b>	0.029	33.919	372.861	899.052
	<b>Q2</b>	0.028	34.178	387.237	912.674
	<b>Q3</b>	0.026	35.537	377.207	896.151
	<b>Q4</b>	0.0267	37.3868	405.87	930.597