

**EFFECT OF FINANCIAL TECHNOLOGY ON FINANCIAL
PERFORMANCE OF THE BANKING INDUSTRY IN KENYA**

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DECLARATION

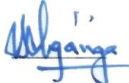
I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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

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DEDICATION

To God, who made all this possible. All glory unto him.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
FP	Financial Performance
GDP	Gross Domestic Product
GOK	Government of Kenya
KNBS	Kenya National Bureau of Statistics
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
VIF	Variance Inflation Factors

ABSTRACT

There has been an immense increase in financial technology utilization in the global financial sector. This has promoted efficiency in operations of the banking sector like the internet and electronic payment among others that have enabled cost savings. This has in turn improved service provision quality by the banks globally. Evidence shows that development practitioners are continually having the conviction that the outreach arising because of fintech will lead to enhanced financial performance among banks. This research sought to determine how financial technology impacts financial performance of the banking industry in Kenya. The independent variable for the study was financial technology operationalized as agency banking, mobile banking, internet banking and ATMs. The control variables were economic growth represented by economic growth rate, exchange rate represented by Kenya shilling to US dollar and interest rates measured as the average bank lending rate on a quarterly basis. The dependent variable was financial performance of the banking industry measured as ROA. A period of 10 years between January 2010 and December 2019 was studied through gathering of secondary data. Descriptive research design was employed while multiple linear regressions model was useful in the analysis of the association between the variable. The data was analyzed by use of SPSS version 23. An R-Square value of 0.625 was produced from the study results which meant that 62.5% of the disparity in financial performance of Kenya's banking industry is attributed to the independent variables while 37.5% in variations of financial performance of the banking industry was related to the variables that were not part of this study. ANOVA findings showed the F statistic was substantial at 5% level with a $p=0.000$. Henceforth, the model was appropriate in justifying the relation amongst the specified variables. In addition, it was established that internet banking, economic growth rate and interest rate had positive substantial values for the investigation while agency banking, mobile banking and ATMs produced positive but weak values in the investigation. Finally, exchange rates produced negative and limited impact on financial performance of the banking industry in Kenya. It is the recommendation of this study that measures ought to be adopted that will enhance internet banking, economic growth rate and interest rate as these measures have a substantial influence on performance of the banking industry in Kenya.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Financial performance is a domain of management, which has remained and will continue to be the focus of management executives and scholars for a long time to come because of its centrality in the life of an organization. Because of the importance attached to financial performance, great attempts have been made to understand it over time in terms of factors that contributes to its realization or none realization (Abata, 2014). Throughout the years, financial technology (fintech) has significantly affected how financial institutions work and have laid a foundation whereupon banks are able to differentiate their products from those of their competitors (Cihak & Singh, 2013). From a glance, it is clear that majority of financial institutions have tried to apply fintech platforms to improve their financial performance (Abdulkarim & Ali, 2019). Evidence shows that, development practitioners are continually having the conviction that fintech is necessary in directing funds to efficient uses and risk allocation to those able to use them, thereby improving financial performance. In contrast, to the extent that accessibility to financial services is limited, the advantages of financial development are likely to be unavailable to individuals and enterprises (Neaime & Gaysset, 2018).

This study was founded on a number of theories such as the diffusion of innovation theory, technology acceptance model, and the financial intermediation theory that have attempted to elaborate the association amongst financial technology and performance. Mises (1912), developed the financial intermediation theory which pose that financial institutions perform a major part in mobilization of deposits and issuance of loans to obtain interest hence to improve their performance, they should

mobilize more deposits from their clients through creation of ways that would make it easy and convenient for customers to transact. Diffusion of innovation is the means through which a novel idea relayed to member of a particular group or social system through use of a chosen preference medium (Rogers, 1995). On the other hand, Technology Acceptance Model (TAM) elaborates on how client embraces an innovative idea and utilizes it (Davis, 1989).

In the Kenyan financial sector, a lot of dynamism is being witnessed in the business environment, which has been attributed to increased technological growth, competition and globalization. Commercial banks have embraced the use of financial technology platforms to reduce their operational costs and reach a wider market. David-West (2015) posited that, financial technology improves the manner in which financial transactions are undertaken and makes it easy for unreached groups to easily access financial services. A positive factor about mobile lending is their ability to offer financial solutions to the lowest income earners that were otherwise excluded from the traditional banking system (Gretta, 2017). Despite the improvements noted in the financial sector in Kenya, some banks are still performing poorly (CBK, 2019). It is therefore imperative to investigate whether financial technology, which has been on the rise has an impact on Kenyan banks financial performance.

1.1.1 Financial Technology

Financial technology is defined as any technological innovation that is impacting the financial sector and its operations (Sheleg & Kohali, 2011). Financial technology could also be referred to as companies that do a combination of financial services and modern technologies and in turn offer internet based and application oriented services that are user friendly, automated, transparent and efficient (Triki & Faye, 2013).

Freytag and Fricke (2017) defined financial technology as new technologies that support financial services. In future, banks are predicted to use social network platforms to acquire more customers who can utilize their mobile devices to benefit from investment opportunities courtesy of financial technology (World Bank, 2017).

Financial technologies are offering a number of technological solutions geared that will offer convenience, quicker turnaround times and operational efficiency (Klapper, 2016). Financial Technologies have been able to affect several financial sector stakeholders. It has improved asset management services by offering services related to wealth management to retail customers by simplifying systems, proposing algorithms that will aid the decision-making process and management of portfolios using artificial intelligence and robots. It has also impacted the banking sector through monitoring savings, credit scores, spending, tax liability, provision of banking services beyond traditional banking, swift transactions through distribution ledger technology, mobile transfers, use of crypto currencies and also mobile lending to individuals and small enterprises through the use of data analytics (Yang & Liu, 2016).

In terms of operationalization, Demircug-Kunt et al. (2018) opines that financial technology as applied today in many financial transactions include; mobile banking which is a link amid a mobile cell phone with a staff or company bank account. Internet banking is providing financial services through a website operated by the bank. Peer to peer crediting is a way of loan funding that facilitates people to borrow as well loan funds with no exploit of a bureaucrat bank as a conciliator. Blockchain, which is a digital ledger in which dealings, prepared in crypto currencies are accounted for openly and chronologically and other technology services including,

agency banking, credit cards and ATM machines that are used in financial transactions. Sheleg and Kohali (2011) operationalized financial technology in terms of the number of online transactions and value of the transactions while Abdulkadir (2018) measured financial technology as the value of both mobile banking and internet banking. The current study will measure financial technology as the amount of funds transacted through ATMs, agency banking, mobile banking and internet banking.

1.1.2 Financial Performance

Financial Performance (FP) is defined by Almajali, Alamro and Al-Soub (2012) as a firm's ability to achieve the range of set financial goals such as profitability. FP is a degree of the extent to which a firm's financial benchmarks has been achieved or surpassed (Lin, 2008). It shows the extent at which financial objectives are being accomplished. As outlined by Baba and Nasieku (2016) FP show how a company utilizes assets in the generation of 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 FP, 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.

The focus of FP is majorly on items that directly alter the statements of finance or the firm's reports (Omondi & Muturi, 2013). The firm's performance is the main external parties' tool of appraisal (Bonn, 2000). Hence this explains why firm's performance is used as the gauge. The attainment level of the objectives of the firm describes its performance. The results obtained from achieving objectives of a firm both internal

and external, is the FP (Lin, 2008). Several names are given to performance, including growth, competitiveness and survival (Nyamita, 2014).

Measurement of FP can be done using a number of ratios, for instance, Net Interest Margin (NIM) and Return on Assets (ROA). This is a measure that shows the capability of the bank to make use of the available assets to make profits (Milinović, 2014). ROA is given by the quotient of operating profit and total asset ratio which is used for calculating earnings from all company's financial resources. On the other hand, NIM measures the spread of the paid out interest to the lenders of banks, for instance, liability accounts, and the interest income that the banks generates in relation to the value of their assets. Dividing the net interest income by total earnings assets expresses the NIM variable (Crook, 2008). Other measures that have been used before to measure FP include Tobin Q (Carter, 2010), Return on Sales (Wang & Clift, 2009) and Return on Equity (ROE) by Mwangi and Murigu (2015).

1.1.3 Financial Technology and Financial Performance

Davis (1989) argues that, changes that have an economic impact are related to entrepreneurial activities, market power and innovation. Theories around Fintech revolution are based on this assumption. Rogers (1995) further argues that, innovation creates a temporary monopoly after which imitators enter the market and compete hence eliminating the monopoly. Hence if financial institutions are to benefit from financial technology while ensuring they have an edge over other banks using innovative products and services, they will surely impact on financial development.

With increment in fintech, households are able to have easier access to borrowings and savings products as a result of smoothing of consumption (Mehotra & Yetman, 2015). One of the expected benefits of fintech is that, the access to credit and saving

facilities by many individuals in the society will bring in economies of scale leading to long-term financial performance of banks (Rasheed, Law, Chin & Habibullah, 2016). Accessibility to and utilization of such services is a crucial factor in promoting sustainable economic and social growth, promoting the reduction of poverty and unemployment, and stabilizing the financial sector (Zins & Weill, 2016).

Lenka and Sharma (2017) stated that, financial access creates jobs for families in the rural areas because the increased involvement of people in economic activities, especially from rural areas would increase their disposable income, increasing their savings and deposits thereby promoting economic development through the multiplier effect. Inability to obtain finance which arises from low fintech adoption affects performance of banks negatively. This is because of the notion that, the absence of funds inhibits savings and investments in income producing activities from the poor. Contrarily, easy access of finance arising from fintech encourages enterprises to make more investments, accept more risk thereby, stimulating performance of banks (Neaime & Gaysset, 2018).

1.1.4 Banking Industry in Kenya

The CBK (2018) defines a bank as a business which carries out, or intends to conduct banking activities in Kenya. Commercial banking business involves accepting deposits, giving credit, money remittances and any other financial services. The industry performs one of the principal roles in the financial sector with a lot of emphasizes on mobilizing of savings and credit provision in the economy. According to the Bank Supervision yearly Report (2018), the banking industry comprises of the CBK as the legislative authority. The industry also has 1 mortgage finance, 42 commercial banks and 13 microfinance banks. Among the 42 commercial banks in

the country 30 have local ownership while 12 have foreign ownership. 11 of the 42 are listed at the NSE.

Many changes have been made in the banking sector to improve their way of operation and work on efficiency. These events include an increase in competition for financial services, banking consolidation and technological innovation. The banks therefore are forced to focus more attention on areas enhancing efficiency such as providing services and products more efficiently and controlling costs in banking. The urge to reduce both administrative, operational costs and competition has led to the adoption of financial technology by banks (The National Treasury, 2016). Ngaruiya (2014) states that adoption of financial technology was perceived as tool which improves the manner in which financial transactions are undertaken. This implies that, the rapid adoption of financial technology uplifted this sector's financial functionality.

In regards to financial performance, commercial banks have been performing differently with some recording increased ROA while others have been on a downward trend. Over the last few years, there have been cases of banks collapsing such as the case of Chase bank, poor performance such as National bank and increased mergers as banks strive to survive in the industry. A case in point is the recent merger of CBA and NIC to form NCBA. Dubai Banks and Imperial Bank have also been subjected to liquidation with the Kenya Deposit Insurance Corporation (KDIC) (CBK, 2017). This is a clear indication for the necessity of investigating on whether financial technology have an influence on financial performance and make policy recommendations that would safeguard banks' financial risk and the stakeholders' funds.

1.2 Research Problem

It has been witnessed globally, that the financial sector has increasingly embraced the use of financial technology. This has consequently improved efficiency in operations of banks such as; securities trading, product innovations, internet and electronic payment among others, this has significantly minimized costs. This has in turn improved service delivery and quality products by banking institutions globally (Babajide et al., 2015). Finance is a crucial aspect of the process of development (Kim, Yu & Hassan, 2018). Evidence shows that development practitioners are continually having the conviction that the outreach arising because of fintech will lead to enhanced FP among banks. In contrast, to the extent that accessibility to financial technology is limited, the advantages of improved financial performance are likely to be unavailable to banks (Neaime & Gaysset, 2018).

Kenyan banks have invested a lot in fintech to address competitiveness, cost and revenue concerns. The big question is whether there is comparative cost advantage by financial institutions which have adopted fintech from those who have not. Since 2008 KCB Bank group introduced a new IT system T24 from the previous TC3 system. The new system was a platform to support other online banking such as internet banking, mobile banking, ATM online services through introduction of VISA ATMs and agency banking. Other banks among them Cooperative bank, Equity bank, Barclays bank , Standard chartered among others followed suite. All this was done to facilitate smooth facilitation of online banking among other functions. The main aim was to enhance performance (CBK, 2019). It is therefore imperative to examine the how fintech impacts the financial performance of Kenyan banks.

International studies in this area exist but they have mainly concentrated on some aspects of financial technology and how they relate to FP. Stoica, Mehdiian and Sargu (2015) studied the effect of internet banking on performance of Romanian banks and arrived to the conclusion that, e-banking avails more efficient and low-cost services that improve banks' performance. De Young et al. (2015) examined how internet banking impacts performance of community banks in Oslo, Norway. The study concluded that internet banking has improved FP of banks. Wadhe and Saluja (2015) explored on how bank profitability in India from 2006 to 2014 was affected by E-banking. The findings showed positive impact of e-banking on profitability in the private sector as well as in the public sector banks'. All these studies were done in a different environment and therefore their findings are not applicable in this study.

Locally, Mugodo (2016) studied how commercial bank performance is impacted upon by electronic banking in the banking sector in Kenya and established that, it does have a positive effect on performance of Kenya's commercial banks. Chirah (2018) studied how alternate channels of banking impact operational efficiency of banks in Kenya and came to the conclusion that, internet banking does not significantly affect operational efficiency. Abdulkadir (2018) focused on the influence of financial technology on financial performance of commercial banks in Kenya and concluded that, financial technology positively influences performance. So was Kemboi (2018). These two studies however only considered two aspects of fintech; that is, internet banking and mobile banking. From the foregoing, it is clear that although there are related local studies in this area, their findings are not consistent. Further, most previous studies have used different measures of financial technology from the measure(s) proposed to be applied in the current study. This research answered the

research question: What is the effect of financial technology on financial performance of the banking industry in Kenya?

1.3 Research Objective

The study's objective was determining how financial technology impacts performance of the banking industry in Kenya.

1.4 Value of the Study

The findings of this study will be useful in making future references by researchers, students and scholars seeking to investigate similar studies. Additionally, they will benefit them in identifying other areas of research by citing associated topics, which needs additional empirical studies in determining study gaps.

The government and its bodies like CBK, Capital Markets Authority will be beneficial in formulating and implementing policies and legislations that governs operations in the financial system. Good policies in terms of financial technology and other variables that will have an influence on financial performance will advance the financial sector thereby improving the whole economy.

The study's findings will also be beneficial to investors in the financial institutions as they will get a deeper understanding on the role performed by financial technology on financial performance and take the necessary actions to maximize their returns. Furthermore, the survey shall make contributions to theory in terms of financial technology and financial performance.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section contains a review of the theories forming the study's foundation. Additionally, previous studies by researchers in this area and those related to it will be discussed. In addition, determinants of financial performance will be discussed in this chapter and the conceptual framework exhibiting how the study variables relate and finally a summary of the literature review will conclude the chapter.

2.2 Theoretical Framework

Theoretical framework provides a foundation for understanding the theoretically expected relationship among the study variables and in this case fintech and financial performance of banks. The applicable theories for this research are; intermediation theory, Technology Acceptance Model(TAM) and diffusion of innovation theory.

2.2.1 Financial Intermediation Theory

The theory by Mises (1912) states that the role played by financial institutions is like banks is very crucial in the intermediation process. The purpose played by the banks is to mobilize clients with excess funds and issue to those shortages at a cost called the interest. The result of this process is the creation of liquidity because money is obtained from clients with funds maturing in the short-term and issue them to clients that require money for the long term (Dewatripont et al., 2010). Mises (1912) noted that the role played by banks in the process of negotiating credit is characterized by issuing money that has been borrowed.

In regards to the development of the theory, Demirgüç-Kunt and Klapper (2012) posits that financial intermediation came as a result of imperfections and frictions in

the market which made it difficult to bridge the gap between borrowers and savers. They observed that by reducing financial market imperfection, financial institutions lead to expanded individual opportunities hence, creating a positive incentive effect. Commercial banks as financial intermediaries play a key role in ensuring good corporate governance, less risk contracts and ease of transaction for players in an economy. By increasing the level of financial technology, banks attempt to reduce these market frictions. In turn, this reduces information asymmetry hence reducing market imperfections among the users (Hannig & Jansen, 2010).

Financial intermediation using the borrowing and lending functions is hence considered a critical function of the banks. According to Mises (1912), by involving the banks in the intermediation process, they are barred from creating money and withdrawing from the process allows them to create money. In contrast, Allen and Santomero (2001) submitted criticisms against the theory by stating that it recognizes risk management as a new trend in the financial sector thereby putting the participation costs concept at the front. The theory is relevant since it is the role of the banks to enhance cost efficiency by increasing client deposits development of fintech which will aid in easy completion of banking transactions.

2.2.2 Diffusion of Innovation Theory

Rogers (1962) was the pioneer of this theory. An innovation denotes a practice, idea or object that is novelty brought into a social framework and on the other hand, innovation diffusion is the manner in that the novel idea is transferred into the social system via predetermined channel over a period of time. In this context, this theory intends to expound on the process by which new inventions, for example, mobile and internet banking are utilized in a system (Clarke, 1995).

Rogers (1995) extended the theory by stating that there was not enough research on diffusion in the technological arena and further explained that technology clusters had more distinct features of technology that are believed as being thoroughly interconnected. For this reason, individuals and communities should be advised on the benefits and drawbacks of the adoption or refusal to adopt innovation, that is, the consequences. Rogers (2003) clearly states that there is a need for interpersonal relationships since diffusion involves a social process. Robinson (2009) criticizes the diffusion of innovations in that it takes a drastically diverse outlook as compared to other theories of change. It does not focus on trying to get people to change but rather sees change as being largely about the progression or reinvention of products and character so that they fit better to what the individual wants or needs. In this theory, the argument is that people hardly change but the innovations need to change according to the needs of people.

According to Sevcik (2004), the process of innovation adoption takes time and it is not something that happens instantaneously. Additionally, he places the argument that diffusion of innovation is largely affected by change resistance as it delays the process of adoption. This process is under the influence of five key attributes namely complexity, compatibility, relative advantage, observability and trialability (Rogers, 1995). Rogers further contends that, how an organization perceives these attributes determines the level of new innovation adoption. If a Kenyan institution recognizes the advantages derived from internet banking, then the innovation will be embraced in the presence of other prerequisites. The adoption of an innovation is more quick in organizations that have an IT department access to the internet compared to those without. The theory is relevant to this study since it explains how innovations like fintech are used in institutions.

2.2.3 Technology Acceptance Model

This model was advanced by Davis (1989) and is also called the TAM. This model mainly looks into the adoption behavior of clients and evaluation that is normally done for the reason of establishing a system to be applied that will not only be useful to the customers but also provide them with convenience. Prior researchers have investigated the principal concept of validity of TAM in gauging individual's acceptance and drew the conclusion that, TAMs principal concept fail in explaining how acceptance by users is influenced by technology as well as other factors concerning usability (Moon & Kim, 2015). Davis (1989) contends that, anticipated usefulness refers to the belief by an individual that the technology or information system adopted will significantly improve job performance after its adoption. Perceived effortlessness of use indicates how easy it is for the individual to learn how to use the new technology and information system. TAM emphasizes on ease of use as a means of predicting the usefulness of a system (Gefen, Karahanna & Straub, 2013).

Pikkarainen, Pikkarainen, Karjaluoto and Pahnla (2014) undertook a study in Finland to determine the real effect of predicted value and derived the conclusion that it aimed to utilize inventive, self-servicing, independence and user friendly to users through the banking system to provide financial services to clients in the twenty first century. Gerrard and Cunningham (2013) observed that, the perceived value hinged on the rendered banking services. The services comprised of loan applications, making utility bill payments, checking balance, transferring fund abroad and obtaining relevant information regarding mutual; funds.

Many researchers opine that, the perceived usefulness of a technology is important when deciding whether to adopt it. Tan and Teo (2013) are of the opinion that, adoption of a technology is impacted by its perceived usefulness. In conclusion, when usage of electronic banking practices has a higher perceived usefulness the likelihood of it being adopted will also be high (Potaloglu & Ekin, 2015). The key driver of electronic banking acceptance are perceived as the TAM variables. This theory is relevant as it explains that for financial technology to be adopted, it must gain acceptance by users and this will be based on ease of use. It therefore implies that if financial technology does not gain acceptance, then its adoption will be low and as such might not have a significant influence on financial performance.

2.3 Determinants of Financial Performance

Determination of the performance of an organization can be ascertained by several factors that could be inside or outside the organization. Internal factors are different for every bank and can be manipulated by the bank. These consist of labor productivity, capital size, quality of management, efficiency of management, deposit liabilities, credit portfolio, policy of interest rate, ownership and bank size. External factors affecting a bank's performance are mainly gross domestic product, Inflation, stability of macroeconomic policy, Political instability and the rate of Interest (Athanasoglou, Brissimis & Delis, 2005).

2.3.1 Financial Technology

FinTech can be described as technology-enabled financial solutions that cover up the whole commodities' scope conventionally offered by banks (Arner 2015). FinTech is also explained as a new form monetary service trade that merges IT with monetary services such as remittances, payments and also management of assets (Lee & Kim,

2015). A financial business comprised of firms that exploit technology to create efficient to the monetary systems (McAuley, 2015)

The appearance of technology has resulted to better methods of doing businesses in the modern era (Stiroh, 2001). Ongori & Migiro (2010) argued that ICT has conveyed an absolute change of standards on the performance of financial institutions and on the delivery of services to the clients in the banking business. In a proposal to take up with worldwide growth, advance the delivery of customer services, as well as lessen the transaction costs, banks have ventured enormously in technology moreover has broadly accepted financial technology networks for delivering an extensive array of value added commodities. Financial technology acts as a catalyst for improved production as well as monetary advance at the firm's intensity (Brynjolfsson & Hitt, 1996). Financial technology makes commodities more accessible and inexpensive by lessening costs of trading for the banks (Bames, 2014).

2.3.2 Interest Rates

The rate of interest is considered as an outlay of funds and an upward or downward movement in interest rate could influence the savings choice of the financiers (Olweny & Omondi, 2010). According to Rehman et al, (2009), the use of an interest cap causes banks to decrease loans and provoke many of these foundations to abscond rural areas, as a result of high cost of production and rate of perils. This hence will translate to slowed growth of the banks. The banks can mitigate this situation by skyrocketing fees and other levies to arrest the situation. Barnor (2014) stated that, unexpected change in interest rate has an impact in investment decisions, hence investors tend to adjust their savings arrangement, generally from capital market to fixed profits securities.

According to Khan and Sattar (2014) interest rate affects performance either positively or negatively depending on its movement. A decrease in interest rate to the depositors and an increase in spread discourage savings. An increasing interest rate to the depositor adversely affects the investment. Banking sector is the most sensitive to movements in interest rates in comparison to other sectors because the largest proportion of banks' revenue comes from the differences in the interest rate that banks charge and pays to depositors.

2.3.3 Economic Growth

The characteristic of growth in an economy is a positive GDP which increases loan demands (Osoro & Ogeto, 2014). An increase in the output of an economy may increase the cash flows expected thereby triggering an increased performance of banks with the opposite impact felt during a period of recession (Kirui et al., 2014). Empirical evidence shows that financial systems developed countries have more efficiency than developing countries (Beck et al., 2003). Developments in the banking sector also has a positive relation to the stability of an economy and monetary and fiscal policies. Countries that have more income have advanced banking sectors in comparison to countries with low incomes (Cull, 1998).

The primary concern of investors is the GDP reports since they indicate the general health of the economy. The long term implication of a healthy growth in the economy is more profitability in the corporate sector and improved lending levels that promote long term growth while the short term implication is that there will be unpredictability in market trends even in periods of positive growth (Beck et al., 2003).

2.3.4 Exchange Rates

Exchange rates command a notable influence on financial performance when there are changes in a currency's exchange rate, this has an influence on the price of import comprising of CPI and production cost. The variation in exchange rates gets transmitted to domestic prices via linkages of prices of imported consumption goods, the variability of exchange rate directly influences the domestic prices. Demand of local goods increases as a result of factors influencing prices triggers rise in level of imported goods and services therefore leading to decreased competition (Magweva & Marime, 2016).

This change in equilibrium mounts pressure on the domestic prices as well as nominal wages due to the increasing demand. More so, due to wages rises, more pressure will be applied on the domestic prices. The reduction in exchange rate is unable to protect the local industry because the increase if the local production cost less than the depreciation rate in comparison to cost of imports equally increase by full amount of the depreciation. This situation of depreciation in currency prompts improved and helpful condition for indigenous industry production (Khan & Sattar, 2014).

2.4 Empirical Review

Local and international studies have been documented in support of the relationship between fintech and financial performance, with varied results.

2.4.1 Global Studies

Nader (2011) assessed how banking innovations affect the performance of banks in Saudi Arabia between 2005 and 2009. In evaluating the effect of the adoption of financial innovation the study utilized a descriptive research design. Data from primary sources was obtained with aid of questionnaires whereas from secondary

sources, it was extracted from the banks published financials. The findings were that both the efficiency and profits of the Saudi Arabia banks was positively influence by availability of several branches, ATMs and mobile banking services. On the contrast, it was revealed that, availability of large number of point of sales terminals (POSs), mobile banking and PC banking did not lead to improvement in profitability.

Tchouassi (2012) utilized empirical investigations from from selected Sub –Saharan nations in establishing if mobile extend banking services to those who are yet to have bank accounts. The investigation’s intention was to determine how mobile devices could be utilized by the unbanked population. According to the findings of the study, the poor and vulnerable households in Sub-Saharan Africa countries mostly incur massive costs while performing basic financial transactions. Hence, it was concluded that using mobile phones improves financial services provision in this population segment and that it only required technological, economic, regulatory and policy innovation to extend such services.

Kajewski (2014) investigated innovations, its benefits, challenges and recommendation for practice in Australia in banking sector. The study embraced a descriptive research design. Secondary data was gathered from risk manuals and financial reports of a sample of 38 commercial banks in Australia. The data was analyzed by applying correlation analysis, autocorrelation techniques and regressions analysis. In the findings it was revealed that, over the years, banks in the need to improving the accessibility of financial services to their customers had increasingly capitalized in various technology platforms. It was also revealed that, because of the innovations the transactions volumes had went up. He observed a positive significant

effect of innovation on banks profitability in that it reduced the cost of doing business and delivered services that were more efficient to the customers.

De Young et al. (2015) investigated the influence of internet on both the performance and output of community banks in Oslo, Norway. This study was conducted during the time frame 2006 to 2019 and the targeted population was 29 banks. The researchers utilized a descriptive research design. A mixture of both secondary and primary data was used where the data from primary sources was obtained through use of online questionnaire and secondary data was extracted from published annual financials of the banks. The findings of the study revealed that traditional community banks compared to those that embraced internet banking recorder lower profits because of the business volumes being low in term of non-interest income and deposits and further they had labor cost that were comparatively higher. Nonetheless, the research also indicates that the financial performance gaps are quickly filled with time because of the impact of economies of scale.

Wadhe and Saluja (2015) explored the on bank profitability in India from the period 2006 to 2014 was affected by E-banking. A sample of 31 Indian commercial banks was used. The impact that E-banking services had on profitability of banks was tested through multiple regression analysis. Findings showed a positive association amongst e-banking and profitability in the private sector as well as in the public sector banks'. Base on this study, it was pointed that an increase in the number of ATMs was necessary to increase profitability. However, a weak association was established between the amount of branches and profitability.

2.4.2 Local Studies

Ocharo and Muturi (2016) study on how alternate banking channels like mobile banking, ATMs, internet and agency banking affects profitability of banks within the County of Kisii revealed a positive association amongst the performance of the banks and the use of alternative banking methods. 187 respondents were the total population of which 170 were employees and 17 were managers of the banks within the Kisii County.

Mwiti (2016) investigated the effect of alternate banking methods on the performance of Kenyan banks. The five-year period from 2011 to 2015 was selected. Regression analysis was employed in determining how these channels impact performance of the banks. A strong positive association amongst the alternate channels and performance was found. Additionally, it showed that alternate banking channels affects financial performance both positively and the effect was substantial.

Kinyua (2018) sought to determine how internet banking impacts the efficiency of banks in Kenya. A population of the 42 banks operating in Kenya was used. Internet banking in this study was the predictor variable given by the natural log of total transactional value via internet banking. The response variable in the study was efficiency, defined as the ratio of total revenue to total assets. His study used five-year (2013-2017) annual data for analysis. The results showed that, all variables were statistically significant in the study. Internet banking together with liquidity produced positive values while bank size produced a negative value for this study.

Kamande (2018) studied how electronic banking influences FP of commercial banks in Kenya. He sampled all of the 42 commercial banks operating in Kenya. The predictor variable was selected as electronic banking as measured by value of

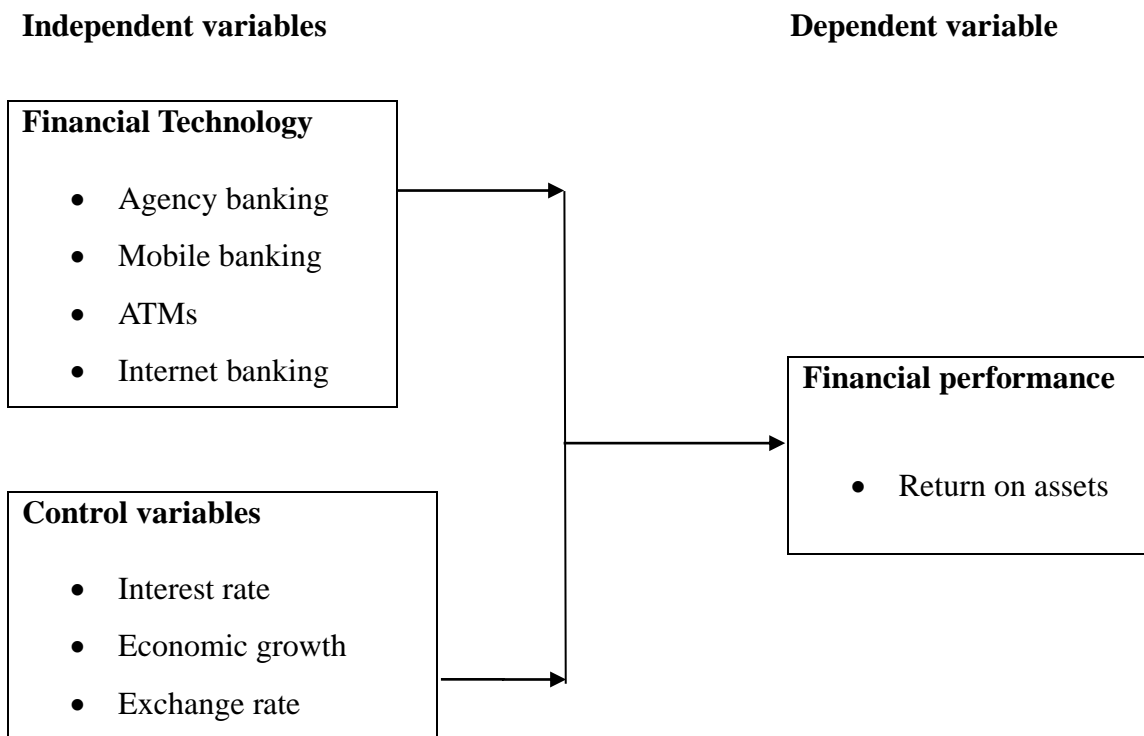
transactions carried out through ATMs, internet banking, agency banking and mobile banking. FP was selected as the response variable of the study and it was measured by the return on assets. Secondary data for 5 years was collected beginning January 2013 up to December 2017. The results revealed that agency banking, ATMs, capital adequacy, liquidity and bank size had both a positive and significant effect on this study. It was also uncovered that mobile banking and internet banking are not statistical significant determinants of FP of commercial banks.

Abdulkadir (2018) looked at the effect of financial technology on FP of commercial banks in Kenya. Financial technology was determined by the number of transactions that were undertaken through mobile banking and transactions undertaken through internet banking. Data was obtained from 35 commercial banks. Size of the commercial bank and capital adequacy ratio acted as the control variables of the study. Secondary data was gathered for all the commercial banks in Kenya for descriptive research design that was used in the study. In establishing the association amongst the variables Pearson moment correlation was utilized whereas the nature of the association was established using regression analysis. The study concluded that, a positive significant effect of financial technology on FP was observed.

2.5 Conceptual Framework

The model below illustrates the expected association existing between the variables. The predictor variable will be financial technology as characterized by agency banking, ATMs, mobile banking and internet banking. The control variables will be interest rates, economic growth and exchange rate. Financial performance given by ROA was the dependent variable.

Figure 2.1: The Conceptual Model



Source: Researcher (2020)

2.6 Summary of the Literature Review and Research Gap

Several theoretical frameworks have explained the expected relation amongst macro-financial technology and performance of banks. The theories reviewed are; financial intermediation theory, technology acceptance model and diffusion of innovation theory. Some of the key determinants of financial performance have also been reviewed. A number of domestic and global studies existing on financial technology and financial performance have been reviewed. The resultant findings have been discussed

The limited agreement among global and local studies on the impact of financial technology on performance banks highlights the need to conduct additional studies. The studies reviewed in Kenya have not shown how the Kenyan bank's FP is affected by financial technology, used different methodology or used different concepts in

measuring financial technology. This research gap was what this study intended to bridge.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In determining the effect of financial technology on financial performance, the study ought to have a research methodology, which lays out the procedure through which the research was conducted. Four sections are incorporated in this chapter that includes the research design, the procedure of collecting data, the diagnostics tests to validate the data and lastly the technique of analyzing the data.

3.2 Research Design

A descriptive design investigated how financial technology impacts performance of the banking industry in Kenya. The research utilized this design as it enabled obtaining of the state of situation as the actually exists (Khan, 2008). The research was well familiar with the area under scrutiny but wished to learn more with respect to the nature of association amongst the study variables hence the research design is the most suitable. More so, the aim of descriptive research is provision of an authentic and correct representation of the study variables and this aids when it comes to replying to the research questions (Cooper & Schindler, 2008).

3.3 Population

A population is the totality of observations of interest from a collection such as events or persons as specified by a research investigator (Burns & Burns, 2008). This research dealt with the banking industry as a whole collecting average quarterly data on the sector financial performance, financial technology and selected macro-economic variables. The unit of analysis was the banking sector and not individual banks.

3.4 Data Collection

This study relied exclusively on secondary data. This was retrieved from KNBS publications and from the CBK website. The quantitative data gathered include net profit and total assets of the banking sector on a quarterly basis, amount transacted using agency banking outlets in the country, ATMS, mobile banking and internet banking, the central bank lending rate and the exchange rate between KSH and USD which was collected from CBK website. Data on GDP and GDP growth rate was collected from KNBS on a quarterly basis. The data was for 10 years from January 2010 to December 2019 on a quarterly basis.

3.5 Diagnostic Tests

To determine the viability of the study model, the researcher carried out several diagnostic tests, which included normality test, stationarity test, test for multicollinearity, test for homogeneity of variances and the autocorrelation test. Normality tests the presumption that the residual of the response variable have a normal distribution around the mean. The test for normality was done by the Shapiro-wilk test or Kolmogorov-Smirnov test. In the case where one of the variables is not normally distributed it was transformed and standardized using the logarithmic transformation method. Stationarity test was used to assess whether statistical properties like variance, mean and autocorrelation structure vary with time. Stationarity was gotten using augmented Dickey Fuller test. In case, the data fails the assumption of stationarity, the study used robust standard errors in the model (Khan, 2008).

Autocorrelation measures how similar a certain time series is in comparison to a lagged value of the same time series in between successive intervals of time. This was

measured by the Durbin-Watson statistic and incase the assumption is violated the study employed robust standard errors in the model. Multicollinearity occurs when an exact or near exact relation that is linear is observed between two or several predictor variables. Variance Inflation Factors (VIF) and the levels of tolerance were used. Any multicollinear variable was dropped from the study and a new measure selected and substituted with the variable which exhibits co-linearity. Heteroskedasticity tests if the variance of the errors from a regression is reliant on the independent variables. The study assessed for heteroskedasticity using the Levene test and incase, the data failed the assumption of homogeneity of variances the study used robust standard errors in the model (Burns & Burns, 2008).

3.6 Data Analysis

After the data was collected from the numerous sources, it was arranged in a way that was able to assist to address the research objective. The SPSS computer package version 23 was applied in analyzing the data. Descriptive statistics were used to calculate the measures of central tendency as well as dispersion together with standard deviation for each variable. Inferential statistics on the other hand entailed correlation and regression analysis. Correlation analysis entailed establishing the degree of association amongst the study variables whereas regression analysis entailed knowing the cause and effect amongst the variables. A multivariate regression analysis was utilized in determining how the dependent variable (financial development) and independent variables: mobile banking, agency banking, internet banking, economic growth and interest rates relate.

3.6.1 Analytical Model

To determine the relative significance of each of the explanatory variables with

respect to financial performance in Kenya, a multivariate regression model was applied.

The study employed the following multivariate regression model;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \epsilon$$

Where:

Y will be performance given by banking sector ROA on a quarterly basis.

β_0 will be the regression constant (parameter of the function)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and β_7 are the coefficients of independent variables

X_1 will be agency banking given by natural log of the total amount of funds transacted through agency banking outlets on a quarterly basis

X_2 will be mobile banking given by natural log of the total amount of funds transacted through mobile banking accounts on a quarterly basis

X_3 will be ATMs as measured by natural logarithm of funds transacted through ATMs on a quarterly basis

X_4 will be internet banking as measured by total amount of funds transacted through internet banking on a quarterly basis

X_5 will be economic growth given by quarterly GDP growth rate

X_6 will be interest rates given by quarterly average bank lending rates

X_7 will be exchange rate given by average quarterly exchange rate of In KSH/USD on a quarterly basis

ϵ will be the error term

3.6.2 Operationalization of the Study Variables

Variable	Measurement	Supporting Literature
Financial performance	Ratio of net income to total assets on a quarterly basis	Milinic (2014)
Agency banking	Natural logarithm of the total amount of funds transacted through agency banking outlets on a quarterly basis	McAuley (2015)
Mobile banking	Natural log of the value of mobile banking transactions per quarter	Sheleg and Kohali (2011)
ATMs	Natural logarithm of funds transacted through ATMs on a quarterly basis	Bames (2014)
Internet banking	Natural log of the value of internet banking transactions per quarter	Abdulkadir (2018)
Economic growth	GDP growth rate per quarter	Osoro and Ogeto (2014)
Interest rates	Average bank lending rate on a quarterly basis	Barnor (2014)
Exchange rate	Average quarterly exchange rate of KSH/USD on a quarterly basis	Magweva and Marime (2016)

3.6.3 Tests of Significance

Parametric tests will be conducted in order to determine the significance of the model as well as individual variables' statistical significance. The F-test which will be obtained from ANOVA will be applied in establishing the overall model statistical significance while that of the individual variables will be obtained from the t-test. The level of significance will be 5%.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND FINDINGS

4.1 Introduction

This chapter exhibits data analysis acquired from CBK and KNBS to establish how financial technology influence financial performance of the banking industry in Kenya. Tables were applied to present the findings of regression, descriptive and correlation analysis.

4.2 Descriptive Analysis

Measures of central tendency and dispersion statistics were used. Central tendency measured the extent to which the data on each variable were concentrated at a central point while dispersion measured the degree to which the data were spread out from the convergent point. The central tendency was measured by the mean while dispersion was measured by the standard deviation. The analysis was extracted from SPSS for 10years (2010 to 2019) on a quarterly basis. Table 4.1 shows the outcomes from all the variables

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	40	2.500	4.700	3.35000	.668331
Agency banking	40	10.164	12.328	11.56210	.644460
Mobile banking	40	16.088	17.868	17.09733	.414932
ATMs	40	7.470	7.872	7.77085	.111403
Internet banking	40	6.930	7.376	7.21175	.137985
Interest rate	40	5.833	18.000	9.58540	2.884208
Economic growth	40	.092	.123	.10823	.008166
Exchange rate	40	75.138	103.518	90.83655	9.511763
Valid N (listwise)	40				

Source: Research Findings (2020)

4.3 Diagnostic Tests

Linear regression assumes insignificant association between pairs of independent variables. The data on financial technology components, interest rates, economic growth and exchange rate were tested for significant Multicollinearity. Variance inflation factors (VIFs) were used in this diagnosis. Table 4.2 shows the VIF test results.

William et al. (2013), defined multicollinearity as the presence of correlation among predictor variables. VIF was utilized in testing this property. Field (2009) stated that VIF values above 10 confirm the existence of this property. This shows that there was no significant multicollinearity between the variables since none of them was above 10.0.

Table 4.2: Multicollinearity Test for Tolerance and VIF

Variable	Collinearity Statistics	
	VIF	1/VIF
Agency banking	2.841	0.352
Mobile banking	2.778	0.360
ATMs	2.551	0.392
Internet banking	1.548	0.646
Economic growth	2.577	0.388
Exchange rate	2.660	0.376
Interest rates	2.604	0.384

Source: Research Findings (2020)

The normality test of the data was done using the Kolmogorov-Smirnov test. The threshold was that, if the probability is greater than 0.05, there is a normal distribution in the data. The findings above indicated that data was normality distributed since the p values were above 0.05. Therefore, the null hypothesis of normal distribution was accepted meaning the researcher failed to reject the null hypotheses.

Table 4.3: Normality Test

Financial performance	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Agency banking	.178	40	.300	.881	40	.723
Mobile banking	.173	40	.300	.918	40	.822
ATMs	.176	40	.300	.892	40	.784
Internet banking	.173	40	.300	.918	40	.822
Economic growth	.174	40	.300	.913	40	.789
Exchange rate	.176	40	.300	.892	40	.784
Interest rates	.173	40	.300	.918	40	.822

a. Lilliefors Significance Correction

Source: Research Findings (2020)

Because serial correlation in models causes standard errors to be biased hence rendering results inefficient, the study used Breusch-Godfrey test for autocorrelation that identifies serial correlation in a model's idiosyncratic error term. From Table 4.4, the null hypothesis of no serial correlation is not rejected since p-value is substantial (p-value = 0.5360).

Table 4.4: Autocorrelation Test

Wooldridge test for autocorrelation in panel data	
H0: no first-order autocorrelation	
F(1, 39) =	0.324
Prob> F =	0.5360

Source: Research Findings (2020)

The error process may be Homoskedastic within cross-sectional units, but have different variance across units: this is called group wise Heteroskedasticity. The hettest command calculates Breuch Pagan for group wise Heteroskedasticity in the residuals. The null hypothesis specifies that $\sigma^2_i = \sigma^2$ for $i = 1 \dots Ng$, where Ng is the number of cross-sectional units. The results in Table 4.5 indicate that the null hypothesis of Homoskedastic error terms is not rejected since p-value was 0.0567.

Table 4.5: Heteroskedasticity Test

Modified Wald test for group wise heteroskedasticity in fixed effect regression model
H0: $\sigma(i)^2 = \sigma^2$ for all i
chi2 (40) = 304.56
Prob>chi2 = 0.0567

Source: Research Findings (2020)

4.4 Correlation Analysis

Correlation analysis determines the association that exists amongst the variables. The study undertakes a Pearson correlation that measures the linear relationship of variables. A correlation of 1 show a perfect positive correlation while of 0 or value close to zero shows no relationship or weak relationship respectively. -1 value, shows a negative perfect relationship and values close to it have strong negative relationship. Table 4.6 shows the value of Pearson correlations for the variables.

In the table, our interest is on how the dependent variable relates to the independent variable. The correlation of agency banking against financial performance of the banking industry is 0.450 implying that agency banking exhibits a moderate positive association with FP of the banking industry. The association is also significant as shown by a p value of 0.000. Mobile banking has a moderate positive correlation with FP of the banking industry. This means that the more the transactions carried out through mobile banking, the more the financial performance of the banking industry. Internet banking and ATMs also exhibited a moderate positive and significant association with performance as shown by 0.383 and 0.493 respectively. The association is significant as the p values are less than 0.05.

Economic growth rate and interest rates exhibited positive and significant association with FP of the banking industry in Kenya as supported by positive correlation

coefficients and p values less than 0.05. Exchange rates however exhibited a negative and significant association with FP of the banking industry as evidenced by a negative coefficient and a p value less than 0.05. The correlation results further reveal that while the independent variables are related to each other, the association is not strong enough to cause Multicollinearity. This is evidenced by the fact no correlation between the independent variables exceeded 0.7.

Table 4.6: Correlation Analysis

		ROA	Agency banking	Mobile banking	ATMs	Internet banking	Interest rate	Economic growth	Exchange rate
ROA	Pearson Correlation	1							
	Sig. (2-tailed)								
Agency banking	Pearson Correlation	.450**	1						
	Sig. (2-tailed)	.004							
Mobile banking	Pearson Correlation	.491**	.349*	1					
	Sig. (2-tailed)	.001	.000						
ATMs	Pearson Correlation	.383*	.342*	.244*	1				
	Sig. (2-tailed)	.015	.000	.000					
Internet banking	Pearson Correlation	.493**	.382*	.313*	.963**	1			
	Sig. (2-tailed)	.001	.000	.000	.000				
Interest rate	Pearson Correlation	.412**	.325*	.203	.310	.269	1		
	Sig. (2-tailed)	.008	.040	.209	.052	.094			
Economic growth	Pearson Correlation	.506**	.240*	.285*	.301*	.297*	.211	1	
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.191		
Exchange rate	Pearson Correlation	-.501**	.261*	.270*	.248*	.848**	.244	.207*	1
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.129	.000	

Source: Research Findings (2020)

4.5 Regression Analysis

To assess the effect of financial technology on FP of the banking industry in Kenya, the below model was used.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$$

A regression analysis was undertaken that had findings as stipulated below.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.791 ^a	.625	.543	.451703	2.010

a. Predictors: (Constant), Exchange rate, Interest rate, ATMs, Mobile banking, Internet banking, Agency banking, Economic growth
b. Dependent Variable: ROA

Source: Research Findings (2020)

In the regression model summary table, the coefficient of determination that is denoted by R square is given as 0.625. It shows the strength in which the model is able to forecast the dependent variable. The value indicates that 62.5% of the changes in FP of the banking industry can be described by the model. The other 37.5% can only be described by other factors that are not in the model. The R value of 79.1% denotes the association amongst the selected predictor variables and FP of the banking industry.

Table 4.8: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.891	7	1.556	7.625	.000 ^b
	Residual	6.529	32	.204		
	Total	17.420	39			

a. Dependent Variable: ROA
b. Predictors: (Constant), Exchange rate, Interest rate, ATMs, Mobile banking, Internet banking, Agency banking, Economic growth

Source: Research Findings (2020)

The significance of the model is established by matching the p value with the alpha value. The model is said to be insignificant when the value of p is higher than that of the alpha while the vice versa is true. The regression analysis is undertaken at 95 degrees of freedom which means the alpha value is 0.05. According to table 4.8, the p value is shown as 0.000 which shows that it is less than the alpha value. We therefore conclude that the relationship between the independent variables and financial performance of the banking industry in Kenya is statistically significant.

For reason of establishing whether to reject or not to reject the null hypothesis we compare the F statistic and the computed value of F as shown in the table 4.8. If the calculated value is higher than the F statistic, the null hypothesis will be rejected. According to the topic under study, the null hypothesis states that there is no effect of the selected independent variables on FP of the banking industry in Kenya. The calculated value of F is 7.625 while the F statistic at an alpha of 0.05 and 7, and 40 degrees of freedom is 3.6. The calculated value is higher than the F statistic which means we reject the null hypothesis. We therefore conclude that there is a statistically significant effect of selected variables on financial performance.

Table 4.9: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
	(Constant)	-.247	.033		-7.576	.000
1	Agency banking	.004	.003	.091	1.326	.187
	Mobile banking	.016	.012	.113	1.319	.189
	ATMs	.018	.045	.031	.393	.695
	Internet banking	.020	.008	.310	2.483	.016
	Interest rate	.014	.002	.531	7.863	.000
	Economic growth	.002	.001	.374	3.655	.001
	Exchange rate	-.017	.022	-.240	-.753	.457

a. Dependent Variable: ROA

Source: Research Findings (2020)

The model can thus be written as:

$$Y = -2.47 + 0.004X_1 + 0.016X_2 + 0.018X_3 + 0.020X_4 + 0.014X_5 + 0.002X_6 - 0.017X_7$$

Where,

Y = Financial performance of the banking industry

X₁ = agency banking

X₂ = mobile banking

X₃ = ATMs

X₄ = Internet banking

X₆ = interest rates

X₇ = economic growth

X₈ = exchange rates

This model may therefore be used to show the effect of any of the independent variables on financial performance of the banking industry, when the variable is increased by 1 unit and all other variables are kept constant.

4.6 Discussion of Research Findings

The study undertook a linear regression model on data collected in determining how financial performance of the banking industry in Kenya is influenced by financial technology. Diagnostic tests were first conducted on the data in order to determine presence of collinearity or presence of residuals in autocorrelations. Collinearity test undertaken showed that all variables had VIF values below 10 and therefore there was no collinearity among the variables. The Durbin Watson value was 2.010 which is less than 2.5 and therefore there were no residuals or autocorrelations that would imply error in the model.

The Pearson correlation showed that the correlation of agency banking with

financial performance of the banking industry was 0.450 implying that agency banking exhibits a moderate positive association with FP of the banking industry. The association is also significant as shown by a p value of 0.000. Mobile banking has a moderate positive correlation with FP of the banking industry. Internet banking and ATMs also exhibited a moderate positive and significant association with performance. Economic growth rate and interest rates exhibited positive and significant association with FP of the banking industry in Kenya as evidenced by positive correlation coefficients and p values less than 0.05. Exchange rates however exhibited a significant negative association with FP of the banking industry as evidenced by a negative coefficient.

Regression analysis undertaken discovered that the model would predict 62.5% of changes in FP of the banking industry in Kenya. The other 37.5% however would be because of factors not in this model. The analysis showed that p value below the alpha value and therefore the relationship was significant. The calculated value of F was higher than F statistic making the null hypothesis to be rejected. In conclusion the findings of the study were that there is a significant effect of the selected independent variables on FP of the banking industry in Kenya.

The findings of the study support a study done by Mwiti (2016) endeavored to examine the effect that alternative banking mechanism has on the FP of Kenya commercial banks. The period under examination was five year ranging 2011 to 2015. To determine the effect that alternative banking mechanism had of the bank financial performance regression analysis was applied. As indicated by the findings the alternative banking channel strongly a positively related to the banks FP. Additionally it was revealed that alternate banking channels affects FP of the banks both positively

and the effect was statistically significant.

The findings are in contrast with Kamande (2018) who studied how electronic banking influences FP of commercial banks in Kenya. He sampled all of the 42 commercial banks operating in Kenya. The predictor variable was selected as electronic banking as measured by value of transactions carried out through ATMs, internet banking, agency banking and mobile banking. FP was selected as the response variable of the study and it was measured by the return on assets. Secondary data for 5 years was collected beginning January 2013 up to December 2017. The results revealed that agency banking, ATMs, capital adequacy, liquidity and bank size had both a positive and significant effect on this study. It was also uncovered that mobile banking and internet banking are not statistical significant determinants of FP of commercial banks

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The section presents the summarized findings, conclusions reached, and recommendations for policy and practice. It also highlights limitations faced and suggestions for additional studies.

5.2 Summary

The regression analysis undertaken by the study showed a substantial impact of selected independent variables on performance of the banking industry in Kenya. The regression model that was used was also strong as it predicted 62.5% of performance of the banking industry in Kenya. Of the four measures of financial technology, only internet banking exhibited positive and statistically significant effect on FP of the banking industry in Kenya. Mobile banking, agency banking and ATMs had a positive but weak impact on financial performance of the banking industry in Kenya.

The other independent variables in the regression model were economic growth rate, exchange rates and interest rates that were the control variables. Economic growth rate had a substantial impact on performance of the banking industry implying that an increased economic growth rate leads to increased financial performance. Interest rate was also found to have a positive substantial impact on performance of the banking industry in Kenya while exchange rates was found to have a negative but not statistically significant influence on FP of the banking industry in Kenya.

The study showed that the p value was less than 0.05 alpha value at 0.000 implying that the model was sufficient. The F statistic was also less than the calculated value of F at 7.625 as the critical F value was at 3.6. The results were applied to determine the significance of the association amongst the variables and whether or not to reject or accept the null hypothesis.

5.3 Conclusion

As indicated by the study findings, various conclusions are made. Of the four measures of financial technology adopted for this study, only the volume of transactions through internet banking has a significant positive effect on FP of the banking industry in Kenya. Although agency banking and mobile banking has a positive effect on FP of the banking industry in Kenya, the effect is not statistically significant and therefore cannot be used to enhance FP of the banking industry in Kenya. Number of ATM transactions also exhibited a positive but not statistically significant influence on FP of the banking industry in Kenya implying that although ATM transactions and number of MFIs has a positive influence on FP, the influence is not statistically significant.

The regression model had a coefficient of determination (R Squared) of 0.625, which means that the model could explain up to 62.5% of the variations in FP of the banking industry in Kenya. Other variations in the FP of the banking industry represented by 37.5% are explained by other factors not included in the model. The model was found to be statistically significant and we can therefore conclude that the model is fairly good in predicting FP of the banking industry in Kenya.

Value of internet banking transactions had a substantial influence on performance of the banking industry implying that the more the internet banking there is in the

country, the more the number of individuals who can access them and this leads to FP of the banking industry. Economic growth also shown a positive and significant association with FP of the banking industry and this implies that as a country records growth in GDP, FP of the banking industry increases.

It was also concluded that interest rate significantly affects FP of the banking industry in Kenya. This implies that when the banks are able to charge a high interest rate, this will improve performance of the banking industry as evidenced in this study. This can be explained by the fact that increased interest rates implies that more interest income to the bank and also protects them from default risk.

This study concurs with Abdulkadir (2018) who looked at the effect of financial technology on performance of Kenyan banks. Financial technology was determined by the number of transactions that were undertaken through mobile banking and transactions undertaken through internet banking. Data was obtained from 35 commercial banks. Size of the commercial bank and capital adequacy ratio acted as the control variables of the study. Secondary data was gathered for all the commercial banks in Kenya for descriptive research design that was used in the study. In establishing the association amongst the variables Pearson moment correlation was utilized whereas the nature of the association was established using regression analysis. The study concluded that, a positive significant effect of financial technology on FP was observed.

5.4 Recommendation for Policy and Practice

The study revealed that FP of the banking industry in Kenya is positively and significantly influenced by the value of internet banking transactions in the country. This implies that a country with more internet banking is likely to record higher FP of

the banking industry compared to countries with low value of internet banking transactions. Therefore, the study recommends that policy makers such as the CBK and other government agencies should come up with policies that make it easy for banks to increase internet banking, as this will have a significant positive contribution on FP of the banking industry in Kenya.

The study revealed that there exists a positive and significant influence of interest rates on FP of the banking industry in Kenya. Thus, an increment in interest rates would on average result to an improvement in FP of the banking industry in Kenya. This study recommends that government and other policy makers should formulate policies that allow for interest rates to be determined by laws of demand and supply and the risk factor associated with a loan.

The study results revealed that there is a positive influence of economic growth on FP of the banking industry in Kenya. The effect is also statistically significant. The study recommends the need to come up with measures that can boost economic growth as this will have an effect on the FP of the banking industry. Such measures would include boosting infrastructure development, creating a conducive environment for doing business and ensuring political stability.

5.5 Limitations of the Study

This research study scope was ten years ranging 2010-2019. It is not guarantee that the study findings would be the same for a period longer than 10 years. More so, it is not guaranteed that the findings would extend beyond 2019. A period longer than ten years would add on to the reliability of the findings since it would consider most economic dynamics such as recessions and booms.

Another limitation of this study is the data used. It cannot be ascertained that the outcomes presented in this study are the reality of the circumstances. The data utilized is only assumed to be accurate. The metrics used may continue to vary year to year depending on the conditions prevailing. Also in comparison to primary data which is usually firsthand information, the current study used secondary data in the public domain. In addition, this study did not exhaust all factors that affect FP of the banking industry but instead centered on determinants of FP of the banking industry largely because of the challenge in obtaining data.

To undertake data analysis, this study utilized a multiple regression model. Because of the deficiencies arising from use of regression model for instance misleading and erroneous findings when the value of the variables changes, it is not possible for the researcher to generalize the findings with confidence. The hypothesized association amongst the variables might change as more data continue to be added in the regression model.

5.6 Suggestions for Further Research

Since the current study used secondary data in studying financial technology and FP of the banking industry in Kenya, this study recommends that a further study be conducted which considers primary data collected by use of interview guides or questionnaire and broaden the context to include various players in the financial sector so as to complement this study.

The study did not exhaust the independent variables influencing FP of the banking industry in Kenya and a recommendation is given that more studies be carried out to factor other variables such as corporate governance, management efficiency, political stability, money supply, educational levels among other variables. By determining

how each variable affect FP of the banking industry it will aid policy makers in controlling FP of the banking industry.

This study covered the last ten years 2010-2019 because this was the latest available data. This study suggests that further study be done covering more years for example from 1963 to data so as to complement or disapprove the current study findings. Also future studies might broaden the context to include countries in East Africa community or Africa instead of Kenya alone. To conclude, because of the deficiencies of regression model, same study may be done but use other models for example Vector Error Correction Model (VECM).

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APPENDICES

Appendix I: Research Data

Year	Quarter	ROA	Agency banking	Mobile banking	ATMs	Internet banking	Exchange rate	Interest rate	Economic growth
2010 Q1	1.000	3.700	10.164	16.088	7.470	6.930	79.581	8.417	0.092
2010 Q2	2.000	3.400	10.336	16.170	7.505	6.939	78.446	8.083	0.094
2010 Q3	3.000	3.500	10.436	16.485	7.542	6.962	76.243	7.750	0.097
2010 Q4	4.000	3.700	10.551	16.593	7.575	6.969	75.138	7.250	0.098
2011 Q1	1.000	3.700	10.461	16.650	7.611	6.987	76.488	6.917	0.098
2011 Q2	2.000	3.400	10.585	16.703	7.630	7.023	78.938	6.750	0.099
2011 Q3	3.000	3.300	10.711	16.739	7.648	7.039	80.926	6.000	0.099
2011 Q4	4.000	3.300	10.803	16.775	7.657	7.057	80.581	6.000	0.100
2012 Q1	1.000	3.800	10.895	16.758	7.679	7.062	82.236	5.833	0.100
2012 Q2	2.000	4.000	10.986	16.795	7.699	7.090	86.124	6.083	0.103
2012 Q3	3.000	3.700	11.082	16.789	7.717	7.111	93.014	6.500	0.104
2012 Q4	4.000	4.600	11.217	16.833	7.734	7.148	93.870	15.167	0.104
2013 Q1	1.000	4.700	11.397	16.900	7.750	7.150	84.139	18.000	0.104
2013 Q2	2.000	4.700	11.513	16.969	7.764	7.161	84.120	18.000	0.105
2013 Q3	3.000	4.700	11.592	16.995	7.782	7.180	84.276	15.333	0.106
2013 Q4	4.000	4.700	11.632	17.030	7.789	7.202	85.578	11.667	0.106
2014 Q1	1.000	3.400	11.654	17.075	7.811	7.212	86.721	9.500	0.106
2014 Q2	2.000	3.400	11.682	17.072	7.841	7.233	84.608	8.833	0.106
2014 Q3	3.000	3.400	11.726	17.085	7.820	7.256	87.255	8.500	0.107

Year	Quarter	ROA	Agency banking	Mobile banking	ATMs	Internet banking	Exchange rate	Interest rate	Economic growth
2014 Q4	4.000	3.400	11.733	17.050	7.828	7.274	85.907	8.500	0.107
2015 Q1	1.000	2.500	11.754	17.055	7.835	7.275	86.327	8.500	0.107
2015 Q2	2.000	2.500	11.777	17.088	7.851	7.281	87.247	8.500	0.107
2015 Q3	3.000	2.500	11.821	17.113	7.855	7.294	88.238	8.500	0.108
2015 Q4	4.000	2.900	11.866	17.151	7.855	7.328	89.878	8.500	0.109
2016 Q1	1.000	3.400	11.911	17.209	7.870	7.331	91.525	8.500	0.110
2016 Q2	2.000	4.200	11.967	17.261	7.872	7.333	95.844	9.000	0.111
2016 Q3	3.000	3.300	12.052	17.307	7.864	7.337	102.967	11.500	0.111
2016 Q4	4.000	2.500	12.043	17.354	7.867	7.340	102.381	11.500	0.112
2017 Q1	1.000	2.900	11.952	17.328	7.869	7.329	101.910	11.500	0.113
2017 Q2	2.000	2.800	12.003	17.348	7.859	7.330	101.035	10.833	0.114
2017 Q3	3.000	2.700	12.033	17.375	7.857	7.324	101.338	10.500	0.114
2017 Q4	4.000	2.700	12.082	17.415	7.854	7.325	101.734	10.500	0.116
2018 Q1	1.000	2.700	12.166	17.467	7.851	7.323	103.415	10.000	0.117
2018 Q2	2.000	2.800	12.209	17.542	7.844	7.322	103.359	10.000	0.118
2018 Q3	3.000	2.800	12.216	17.588	7.839	7.321	103.518	10.000	0.119
2018 Q4	4.000	2.800	12.245	17.654	7.834	7.317	103.351	10.000	0.119
2019Q1	1.000	2.900	12.271	17.663	7.830	7.324	101.833	9.500	0.121
2019Q2	2.000	2.800	12.328	17.734	7.831	7.326	100.759	9.000	0.122
2019Q3	3.000	2.900	12.316	17.819	7.836	7.349	100.706	9.000	0.123
2019Q4	4.000	2.900	12.316	17.868	7.809	7.376	101.908	9.000	0.123