EFFECT OF FINANCIAL TECHNOLOGY ON ECONOMIC GROWTH IN KENYA

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES, UNIVERSITY OF NAIROBI

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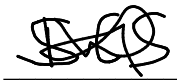
DECLARATION

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.

Signed:  Date: 16/11/2022

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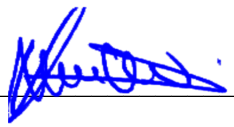
This research project has been submitted for examination with my approval as the University Supervisors.

Signed:  Date: 16.11.2022

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DEDICATION

This research project is dedicated to my parents, Mr. Benson Sigei and Mrs. Bornace Sigei for their tremendous financial support throughout my education life and for laying down my academic foundation, my brothers and sisters for being the pillows, role models, cheerleading squad, inspiring and encouraging me to pursue further education.

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May God bless you.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
GDP	Gross Domestic Product
GNI	Gross National Income
KCB	Kenya Commercial Bank
KNBS	Kenya National Bureau of Standards
MFI	Micro Finance Institution
ROA	Return on Assets
ROE	Return on Equity
SPSS	Statistical Package for Social Sciences

ABSTRACT

Financial technology has significantly affected the operation of financial firms and created the foundation for the financial institutions to differentiate between their products and their competitors. Fintech is essential for directing money to efficient purposes and allocation of risk to people who can utilize them, and this boosts economic growth. The objective of this research was to determine the effect of financial technology on Kenya's economic growth. The study was based on disruptive innovation theory, diffusion of innovation theory and Schumpeterian theory. The independent variable was financial technology measured using the number of transactions through mobile banking, internet banking, agency banking and Mpesa while the control variables were unemployment rate and inflation. The dependent variable that the research attempted to explain was the economic growth in Kenya. The data was collected on a quarterly basis over a period of 10 years (from January 2012 to December 2021). A descriptive research approach was employed in the research, with a multivariate regression model used to examine the connection between the study variables. The study's findings yielded an R-square value of 0.995, indicating that the chosen independent variables could explain 99.5 percent of the variance in Kenya's economic growth, while the other 0.5 percent was due to other factors not investigated in this study. The F statistic was significant at a 5% level with a p=0.000. This suggests that the model was adequate for explaining economic growth in Kenya. Further, the findings demonstrated that mobile banking; internet banking and Mpesa had a significant positive impact on economic growth as indicated by positive coefficients and p values less than 0.05. Inflation was established to possess negative and considerable outcome on economic growth, as shown from the negative coefficient and a p value less than 0.05 while agency banking and unemployment rate were found not to have a significant effect. The research recommends the need for policy makers to create a conducive environment for development of more fintech innovations while at the same time ensuring the safety of the existing ones as this contributes to a rise in economic growth. The study also recommends that there is need to come up with effective measures of managing inflation levels as high inflation has an adverse effect on economic growth. The study recommends the need for future researchers to conduct a study for a longer period of time to capture the effects of economic cycles.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The use of financial technology (fintech) has been on the rise in the last decade (Jagathi, 2021). Financial firms such as banks and microfinance institutions have realized that by leverage information technology, they are in a better position to reach a wider market at a lower cost and with enhanced customer service efficiency (Bochaberi & Job, 2021). The ability of fintech usage to reach a wider customer base means that most households have access to financial services which enables them to save, borrow and invest in business. Increased investments resulting from the use of financial technology are likely to boost economic growth (Njoroge, 2021). Therefore, financial technology is expected to have a positive effect on economic growth.

This research drew support from disruptive innovation theory, diffusion of innovation theory and Schumpeterian theory. Disruptive innovation theory by Christensen (1997) is the anchor theory and it is based on the idea that innovations can transform a prevailing market by improving access, ease, cost efficiency, as well as market easiness where items as well as services are expensive. The theory holds that use of disruptive technology is crucial in attaining intended growth. Diffusion of innovation by Rogers (1995) is about the mechanism via which a new thought is disseminated to a particular societal system relies on utilizing a specific preference channel. The Schumpeterian theory by Schumpeter (1934) describes a process of creative destruction where wealth creation occurs through disruption of existing market structures due to introduction of new goods and/or services that cause resources to move away from existing firms to new ones thus allowing the growth of the new firms and the economy as a whole.

In the Kenya's financial sector, technological advancements in the financial sphere are continuing to drive development and impact the economy as a whole. The Kenyan financial industry has placed an increased emphasis on financial technology as a strategic weapon to attain the industry's aim of lowering costs while simultaneously growing revenues. KCB has been promoting KCB M-PESA and adopted fuliza in 2019, Equity has been using Equitel and Eazzy banking app, NCBA bank has been offering Mshwari and recently Fuliza. Other forms of fintech in Kenya include mobile internet banking, agency banking, Automated Teller Machines (ATMs) among others (CBK, 2020).

1.1.1 Financial Technology

Any innovation in technology that improves the efficiency of the financial sector is considered part of financial technology (Sheleg & Kohali, 2015). Financial Technology is providing a wide range of technology solutions to improve efficiency, speed of reaction, and customer satisfaction (Klapper, 2016). The financial industry has been impacted by the rise of mobile banking, the use of distributed ledger technology to facilitate faster transactions, the proliferation of cryptocurrencies, the proliferation of mobile lending to individuals and small market enterprises, and the use of data analytics to better understand consumers' saving habits, credit histories, spending habits, and tax obligations all of which are aspects of financial technology (Yang & Liu, 2016). In Kenya, some of the financial technologies adopted include mobile banking, internet banking, ATMs, agency banking, Mpesa, digital lending among others (CBK, 2021).

Fintech has been used as a mechanism to an end though not the end itself. Globalization, volatility in client needs, competitiveness, and technical improvements

are examples of external environment dynamics that have produced ongoing environmental upheavals and necessitate more innovations from executives (Thompson & Strickland, 2013). As a growth technique, fintech aims to break into modern markets, share market increase, as well as provide a company a competitive advantage via employing strategies that are diverse from the competition. The rising competitiveness in international marketplaces has compelled firms to acknowledge the fintech essence as the business environment changes and traditional services as well as products lose value (Nbakk & Jensen, 2013).

Fintech has been operationalized before in various ways. Fintech has been operationalized before in terms of mobile banking, internet banking, ATMs, agency banking among others. Internet banking provides financial services via a bank's website (Zins & Weill, 2016). Peer-to-peer financing is a kind of lending that allows people to lend to one another and also loan money which are not used as mediators by a bureaucratic bank (Koki, 2018). This study attempted to quantify the level of fintech usage, as defined by the total value of transactions carried out via agency banking, internet banking, mobile banking and M-pesa. This measure has been used before by Abdulkadir (2019).

1.1.2 Economic Growth

Economic growth denotes a rise in the average rate of output produce per individual generally measured on an annual basis (Boldeanu & Constantinescu, 2015). It also means the rate of change of output or national income in a given period of time. Economic growth also denotes growth in the production of goods as well as services during a specified time frame (David & Ampah, 2018). Economic growth is sometimes designated as a rise in per capita gross domestic product (GDP) or other

aggregate income metrics (Ofor & Alagba, 2019). According to Haller (2012), the process of structural, quantitative and qualitative variations with a positive effect on the overall economy as well as the people's living standard can be termed as economic growth, and it follows a continuously ascending course. This can be effectively achieved through the utilization of readily available resources and a rise in capacity of nation's production which catalyzes economic growth. The current study adopts the definition by Ofor and Alagba (2019) that focuses on GDP growth rate.

Economic growth produces a legitimate expectation among investors and consumers of continued economic growth. This inspires consumer spending and business investment which leads to a rise in the demand and money supply moving through the economy (Mogaka, Kiweu & Kamau, 2015). Economic growth makes simpler the way in which the population and society at large accesses the redistribution of incomes. The slight differences and swelling effects of the up-surging rates, grow for periods of one decade or more. Production of goods and services increases with an increase in the economic growth rate, goods as well as services production, is increasing and in turn, the number of job opportunities grows, unemployment rate reduce and the population's living standards improves (Boldeanu & Constantinescu, 2015).

The most commonly used indicator of economic growth is the GDP and is significant for the entire system of national accounting (Haller, 2012). It provides a better snapshot for an economy and the growth rate of its innumerable sectors causes a change in the economy. The comparative strength of business activities can accurately be recorded by the GDP and like a barometer, it can effectively measure all business activities (Aziz & Azmi, 2017). A rise in the real gross national income (GNI) can

also accurately determine the economic growth of a country, and is motivated by a rise in capital and/or population. To effectively intensify the real GNI per capita, a nation ought to raise the capital level, labor and the general efficiency of either capital or labor (Asabere, McGowan & Lee, 2016). The current study utilized GDP growth rate as a measure of economic growth as used before by previous scholars such as Mogaka et al. (2015) and Ofor and Alagba (2019).

1.1.3 Financial Technology and Economic Growth

The diffusion of innovation hypothesis says that every economically impactful change centers on entrepreneurship, market power and innovation. This justification leads to theories regarding the technological revolution. According to Rogers (1995), an invention temporarily creates a monopoly, which is then broken up through imitation. Therefore, institutions will undoubtedly have an impact on performance if they use technology innovations and secure hedging other institutions utilizing innovative products and services.

According to Lenka and Sharma (2017), having more financial access promotes job creation in rural areas since residents in these areas will have a greater disposable income, allowing them to save and increase their deposits, which increases overall economic growth due of the multiplier effect. The inability to secure financing as a result of poor fintech adoption has a detrimental repercussion on the performance of a financial institution. This is due to the belief that the poor's inability to save and invest in income-generating activities is due to a lack of finances. Fintech’s ease access to funding, on the other hand, encourages businesses to invest more and take on more risk, boosting performance of the financial institution (Neaime & Gaysset, 2018).

Despite the perceived benefits of fintech and the electronic commerce, there is still a debate on if and how the adoption of this technology improves the growth of the overall economy (Matevu & Kerongo, 2015). The investment in fintech and technology and electronic commerce by organizations needs innovation costs which comes along with various risks that the firms should be willing to take in order for them to accurately evaluate the impact of the adoption on growth (Idun & Aboagye, 2014).

1.1.4 Financial Technology and Economic Growth in Kenya

Kenya is one of Sub-Saharan Africa's fastest-growing economies with an average annual growth of 5.4%. A report by the World Bank (2020) states that the country's financial sector experiences significant growth both in size and complexity which greatly boost an economy's overall growth. The sector mainly constitutes of banking, insurance, capital markets, credit and savings cooperatives and pensions. Other key players consist of microfinance institutions, money remittances companies, foreign exchange bureaus and development finance institutions. Safety nets and resolution organizations additionally exist and incorporate policyholders' compensation funds for the insurance industry.

Kenya is a leader in fintech adoption in the region. Because of this, financial services are more available to the public, productivity has risen, and revenues have grown. Kenya also participates in regional organizations such as the East African Community. The East African Community includes Kenya as a member state as well (CBK, 2020). The broad use of financial technology in Kenya has led to considerable improvements in both the operational and financial performance of commercial banks. These improvements have been brought about by greater levels of both

productivity and cost efficiency. Banking institutions in Kenya have invested heavily in developing cutting-edge technology and educating their staff on how to make the most of these advancements (Narteh, 2017).

The financial industry in Kenya is being continuously remolded and updated by technological advancements in the financial sector. The Kenyan banking industry has placed an increased emphasis on financial technology as a strategic weapon to accomplish the organization aim of growing revenues while simultaneously lowering operating expenses. KCB has been promoting KCB MPESA and adopted fuliza in 2019, Equity has been using Equitel and Eazzy banking app, NCBA bank has been offering Mshwari and recently Fuliza. Other banks also have some aspect of mobile lending through their digital platforms (CBK, 2020). The big question is whether there is economic growth resulting from the use of financial technology.

1.2 Research Problem

Financial technology has significantly affected the operation of financial firms and created the foundation for the financial institutions to differentiate between their products and their competitors. Abdulkarim and Ali (2019) argue that fintech is essential for directing money to efficient purposes and allocation of risk to people who can utilize them, and this boosts economic growth. Fintech is anticipated to improve financial inclusion, resulting in improved efficiency of the intermediaries (Rasheed, Law, Chin & Habibullah, 2016). Neaime and Gaysset (2018) asserted that in general, fintech has a substantial influence on growth of economies.

The financial sector in Kenya plays a crucial role in economic growth and especially towards achievement of Vision 2030. To enhance their competitive advantage, financial firms and especially banks in Kenya have embarked on enhanced

digitization putting fintech on the forefront with a view of improving their network base, reducing personnel costs, competing favourably with their peers and to improve on their organization performance, however, with all this heightened digitization, some banks have shown drop in organization performance, others under statutory management while still others have closed completely. Apart from the competition for customers amongst commercial banks in Kenya, they are also facing competition for the same customers against increased digital lenders in the Kenyan market (Koki, 2018). Further, the economic growth in Kenya has been volatile with increases in GDP growth rate often followed by decline. Kenya therefore offers a good context to investigate whether fintech adoption has an effect on economic growth.

Although there have been international studies in this field, they have mostly focused on certain elements of fintech and how they correlate to other variables. Jagathi (2021) focused on the effect of ATMs on profitability of Indian banks and concluded that ATM adoption had a positive effect on profitability of banks. Hossain (2021) conducts research on the effect that the use of e-banking technology in Bangladesh's state-owned commercial banks has had on the profitability of those institutions and concluded that e-banking has a positive influence on profitability. Okoye, Omankhanlen, Okoh and Isibor (2018) investigated the effects of technology based financial services on customer satisfaction on Nigeria. The result indicated that electronic-based banking has enhanced customer satisfaction in Nigeria. All these investigations were conducted in a distinct setting thus, their results cannot be applied to the current situation due to different social and economic settings.

Locally, Bochaberi and Job (2021) focused on the effect of mobile banking on the performance of commercial banks in Kenya and concluded that mobile banking has a

positive effect. The study however focused on only four commercial banks and did not take into account economic growth. Njoroge (2021) investigated the impact that agency banking had on the development of the Kenyan financial industry and came to the conclusion that it was beneficial. This study presents a conceptual gap as it did not relate financial technology with economic growth. Abdulkadir (2019) studied how commercial banks in Kenya profitability is impacted by fintech and concluded that fintech has a favorable impact on performance. This study presents a conceptual gap as it focused on profitability leaving a gap on economic growth.

This study is motivated by the increased adoption of fintech. Fintech is expected to enhance financial inclusion which in effect will influence economic growth. Although there are previous studies in this area, there exist research gaps. First, most of the studies conducted locally have operationalized financial technology in different ways, with the majority choosing for a restricted definition. This presents conceptual gaps that the current study intends to fill. There are also methodological gaps that arise from previous studies conducted locally; most of them were conducted for a short period of time (mostly five years) which might not be adequate to capture the effect of financial technology on financial performance. The current study considered a 10 year period with data collected quarterly. Further, most of the local studies have relied on primary data while the current study made use of secondary data that was considered more objective. The current research was based on these gaps and attempts to answering the research question; how does fintech influence economic growth in Kenya?

1.3 Research Objective

The objective of this study was to determine the effect of financial technology on economic growth in Kenya.

1.4 Value of the Study

This study's results will contribute to the existing theoretical and empirical literature on fintech and economic growth. The findings will also help in theory development as they will offer insights on the shortcomings and relevance of the current theories to the variables of the study. Subsequent studies may also be carried out based on the recommendation and suggestions for further research.

The findings of the research might be relevant to the government and the regulator CBK in developing regulations for the population under investigation. The study's findings will help investors who are considering investing in the population under investigation by providing information on the risk-return tradeoffs that exist in such organizations and their impact on profitability.

The conclusions will aid investors as well as practitioners understand the relationship between the two variables, that is important for ensuring strong management team with diverse viewpoints and competences streamlining operations as well as managing fintech, as well as for building confidence among corporate stakeholders, which will ultimately optimize economic growth.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this section, the theories which are relevant to the study are discussed in the theoretical review, also empirical studies in the area of study or similar area is discussed. The chapter also exhibits the conceptual framework indicating the anticipated association of variables and to conclude the chapter is the summary of the literature review.

2.2 Theoretical Framework

This section surveys the theories that underpin the study of innovation and performance. The study reviewed the disruptive innovation theory, diffusion of innovation theory and Schumpeterian theory.

2.2.1 Disruptive Innovation Theory

Christensen (1997) pioneered the theory and it is the anchor theory for the current study. It is based on the idea that innovations can transform a prevailing market by improving access, ease, cost efficiency, as well as market easiness where items as well as services are expensive. Disruptive innovation, according to Christensen (1997), is best pertinent in an unappealing market where new products and services later reshape the market. Comprehending the natural laws that leverage disruptive technologies in new markets as well as products creation is the most effective path to success (Kostoff, Boylan, & Simons, 2004). Other critical concerns include understanding the disruptive technology dynamics or if management will be able to adapt correctly to taking advantage of emerging chances.

Firms begin by focusing on the market's lower end clients (lower tier consumers) by offering goods as well as services which they can afford (Christensen, Baumann, Ruggles, & Sadtler, 2006). Disruptive innovation allows customers to buy products or services which previously they could not afford (Baumann, Ruggles, & Sadtler, 2006). This may not be the situation; there are variables that allow consumers to buy items and services that they could not formerly afford, such as competition and government rules.

According to Kostoff et al. (2004), moreover, the theory posits that enterprises that maintain innovation exclusively target high-end clients attempting to improve their performance. However, this might not always be the situation; the world's most inventive organizations target all types of clients. They can broaden their market segments scope, boost revenue, and improve performance this way. The theory hypothesizes a positive fintech impact on economic growth. Disruptive innovation theory has been critiqued for not offering a solution on how firms should identify technologies that can disrupt industries (Baumann et al., 2006). The theory is relevant to the current study as it holds that technology adoption can enhance growth of firms and essence overall economic growth.

2.2.2 Diffusion of Innovation Theory

Rogers (1962) was then pioneer of this theory. An innovation is any newly introduced ideas, practices or item into a social structure whereas, on the contrary, innovation dissemination is the way the new concept is transmitted over a period of time to the social system via a default route. In this regard, this theory attempts to outline how new innovations are accepted and utilized in a social system such as mobile banking and online banking (Clarke, 1995). Rogers (1995) broadened the idea by saying that

the study on technological diffusion was insufficient, further explaining that the technology cluster had additional distinctive characteristics that were thought to be fully linked. That is why the advantages and repercussions of embracing or refusing to embrace innovation should be notified to people and societies at large. Rogers (2003) says plainly that interpersonal connections are necessary because dissemination includes a social process.

Robinson (2009) criticizes the theory for taking a dramatically different view of other change theories. It is not about attempting to persuade people to change, though about making progress or re-inventing goods and character, so that they can better suit what the person wants or needs. In this idea, people do not change, but innovations have to adapt to the demands of the people. The invention process takes time, as per Sevcik (2004), and it does not happen immediately. He also believes that the spread of innovation and the opposition to changes has the greatest impact on the process of innovation because it delays it down.

Rogers (2003) argues that the perception of these characteristics by an organization affects the degree of breakthrough technology adoption. If an organization realizes the benefits arising from innovation, these innovations will be taken into account when additional technologies are available. Innovation is quicker adopted in companies having internet access as well as information technology than in those lacking. The hypothesis is based on the present research, which shows how innovations like innovation are taken up by financial institutions. This theory is appropriate to the research as it aids in comprehending how fintech is taken up by financial firms and how this influences economic growth.

2.2.3 Schumpeterian Theory

Schumpeter (1934) pioneered in highlighting the role of innovation in the entrepreneurial process. Schumpeter (1934) describes a process of creative destruction where wealth creation occurs through disruption of existing market structures due to introduction of new goods and/or services that cause resources to move away from existing firms to new ones thus allowing the growth of the new firms. Accordingly, Schumpeter calls innovation the specific tool of entrepreneurs, the means by which entrepreneurs exploit change as an opportunity for a different business or a different service. Schumpeter (1934) stressed the role of entrepreneurs as primary agents effecting creative destruction, and emphasized to the entrepreneurs the need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation; as well as their need to know and to apply the principles of successful innovation.

This Schumpeterian view of thinking has been carried forward by successive scholars and researchers (Drucker, 1985; Lumpkin and Dess, 1996; Shane, Covered and Westhead, 1991). On his part, Drucker (1985) held out the entrepreneur always searching for change, responding to it, and exploiting it as an opportunity, and engaging by this means in purposeful innovation. Lumpkin and Dess (1996) saw the process of creative destruction as initiated by an entrepreneur, which makes innovation an important success factor within entrepreneurship. Furthermore, the link between entrepreneurship and innovativeness is supported by the results of Shane, Kolvereid and Westhead (1991), who found that innovation is among the key motives to start a business.

This theory has been critiqued due to its assumption that innovation is the main determiner of economic growth. Drucker (1985) argues that this view is far from reality as economic growth is a function of many other variables. Schumpeterian growth theory supposes that technological progress comes from innovations carried out by firms motivated by the pursuit of profit. That is, each innovation is aimed at creating some new process or product that gives its creator a competitive advantage over its business rivals; it does so by rendering obsolete some previous innovation; and it is in turn destined to be rendered obsolete by future innovations (Schumpeter, 1934). The theory is relevant to the current study as it acknowledges the role of fintech on economic growth.

2.3 Determinants of Economic growth

The elements that drive economic growth have been discussed in previous literature. Financial technology, inflation, unemployment rate, and other external factors all contribute to economic growth (Athanasoglou et al., 2005). This section discusses some of these determinants.

2.3.1 Financial Technology

Abdulkarim and Ali (2019) argue that fintech is essential for directing money to efficient purposes and allocation of risk to people who can utilize them, and this boosts economic growth. Fintech is anticipated to improve financial inclusion, resulting in improved efficiency of the intermediaries (Rasheed, Law, Chin & Habibullah, 2016). Neaime and Gaysset (2018) asserted that in general, fintech has a substantial influence in increasing economic growth of financial firms.

With the number of fintech transactions rise, households, borrowing and savings products are made easy for everyone (Mehotra & Yetman, 2015). Long-term

performance of financial institutions is one of the projected benefits of fintech (Rasheed, Law, Chin & Habibullah, 2016). As per system Zins and Weill (2016) making sure people have simple accessibility to and are able to utilize these services is vital in fostering social growth and sustainable economic, decreasing destitution, and helping to stabilize the financial sector. In this study, financial technology will be measured as the total number of transactions through Mpesa, agency banking, internet banking, and mobile banking.

2.3.2 Inflation Rate

Rates of inflation can affect the economy of a country substantially. For instance, during times of price movements and increments, prices of property will increase. Therefore, when inflation in an economy rises, the general cost of goods is likely to increase. This will subsequently affect how firms perform financially. Therefore, many investors who engage in sale of goods and services in the market usually include an allowance for inflation (Biller, 2007).

Higher rates of inflation will translate to prices being higher for consumers slowing down business and thus reduce firms' earnings. Prices that are high also trigger a regime that has higher interest rate (Hendry, 2016). According to Fama (1970), inflation is likely to be negatively associated with real economic activity, and as a result likely to be positively related to the market performance. Thus, growth ought to be associated negatively with the expected price level, with interest rates at the short-term representing the international fisher effect.

2.3.3 Unemployment Rate

Assume the stock and labor markets are both in balance. Now, imagine there is a negative shock to labor demand, resulting in a fall in wages and salaries and an

increase in unemployment, ceteris paribus. Increased unemployment will result in lower disposable income for the employees affected, lowering demand for stocks. Stock durability suggests that the short-term supply of stocks is fixed, thus stock prices will fall in this situation (Osoro & Ogeto, 2014).

The prospering of a nation is intimately related with the economic, which includes factors like unemployment, GDP, inflation, remittances, capital supply, interest rate, and exchange rates, according to both theory and empirical literature. Variations in economic fundamentals drive share price movements, and these fundamentals affect future prospects (Rehman, Sidek, & Fauziah, 2009).

2.4 Empirical Review

Local as well as global researches have determined the link between fintech and economic growth, the objectives, methodology and findings of these studies are discussed.

2.4.1 Global Studies

Hossain (2021) conducts research on the effect that the use of e-banking technology in Bangladesh's state-owned commercial banks has had on the profitability of those institutions. For the purpose of conducting an analysis of the panel data that was acquired from the sample banks, a pooled ordinary least square (OLS) estimate was used. Studies have shown that in the first year after an institution implements electronic banking, the practice has a considerable negative impact on the ROA, ROE, and net interest margin of the institution. However, the studies suggest that one year after using electronic banking, ROI improves significantly. This research was carried out in Bangladesh, which has a distinct cultural and economic environment in comparison to Kenya.

As part of her research on virtual banking, Jagathi (2021) investigated the extent to which the number of banks in India with established ATMs is proportional to the amount of profit such banks make. The selection process consisted of applying straightforward methods to choose two banks from the public sector and two banks from the private sector. For the purpose of gathering the required information, secondary sources such as annual reports from chosen banks are used. The data for the research was gathered over the course of three years, from 2015–2016 to 2017–2018. When comparing and analyzing the acquired data, the percentage method and correlation are both useful tools. Findings suggest a positive correlation between ATM use and economic performance. India, whose cultural and economic context is distinct from that of Kenya, served as the location for the research.

Le, Ho and Mai (2019) focused on how financial innovations affect income disparity in economies transformation. Assessing the effect of financial innovations on income inequality in 22 transitional economies from 2005 to 2015 involves using the two-stage least squares model and two financial innovations indices. The research outcomes depicted presence of a negative link between the financial innovations index and the income inequality coefficient. One of the proposals made is that policy recommendations are necessary to reduce income disparity through the creation of financial innovations. The study presents a conceptual gap as economic growth was not taken into account.

Dawood et al. (2019) studied the mobile lending influence on alleviation of household poverty in Indonesia. Via the Binary Logistic model and data from 300,000 families from the 2017 Indonesian National Social and Economic Survey, the study found that mobile lending decreases absolute poverty amongst households. Additionally, mobile

lending can be a compensation for limited assets, reduced non-agricultural occupations in rural areas, and little education for family heads. Additionally, it will reduce incentives for poor, to reduce rural-urban migration for low-skilled rural people who seek non-agricultural job opportunities. This study focused on only one aspect of fintech and therefore a conceptual gap.

Okoye, Omankhanlen, Okoh and Isibor (2018) investigated the effects of technology based financial services on customer satisfaction on Nigeria. This study was designed to identify the extent to which technology has impacted customer satisfaction in the Nigerian banking sector. Data analysis was based on responses obtained from 120 customers of three Deposit Money Banks within Ogun and Lagos States of Nigeria. Features of bank service evaluated in the study are time saving, convenience, crime reduction, reliability, risk reduction, and ease of use. The result showed significant positive impact of all the above service features on customer satisfaction, an indication that electronic-based banking has enhanced customer satisfaction in Nigeria. It is recommended that more service points and user-friendly customer-oriented financial products be provided to support this initiative. The focus of this study was on customer satisfaction and therefore a conceptual gap.

2.4.2 Local Studies

Misati, Osoro and Odongo (2021) evaluated the impact of financial innovation on financial inclusion and economic growth in Kenya. They employed autoregressive distributive lag models. Real gross domestic product (GDP) and Credit to private sector indicators were used to measure economic growth and financial depth respectively. The results reveal that mobile transactions in value, the number of mobile agents and internet have significant positive impact on economic growth. The

findings further reveal that the impact of innovations on economic growth is indirect through financial depth channels. They therefore concluded that investment in cost effective innovation will be key determinant of bank's profitability. The study reveals a conceptual gap as some aspects of fintech such as Mpesa were not considered.

Mobile banking has seen widespread adoption, and Bochaberi and Job (2021) are interested in determining how its use has impacted the bottom lines of commercial banks. The Equity bank Kenya limited, the Co-operative bank of Kenya limited, the KCB bank Kenya limited, and the Family bank Kenya limited were the primary commercial banks in Kenya that were analyzed for the purpose of this research. The researcher relied on a descriptive approach for the technique of investigation. The study was conducted using the technique of purposive sampling, and the participants and respondents who were selected to take part provided the essential information. According to the conclusions of the study, the introduction of mobile banking has had an effect on each of the four most significant commercial banks in Kenya. Four commercial banks were the only ones studied; additional extensive studies including other types of financial institutions are required.

Njoroge (2021) investigated the impact that agency banking had on the development of the Kenyan financial industry and came to the conclusion that it was beneficial. To conduct the evaluation of the goals, a descriptive study approach was used. This study looked at the whole financial sector, from the 43 commercial banks to the 24 microfinance institutions. The data that was collected from the reports of the Central Bank of Kenya spanning the years 2011-2020 was analyzed with the use of Statistical Package for the Social Scientists. Because there was a dearth of data from previous years, it was essential to focus attention on information dating from 2011 and later.

During the course of the inquiry, both descriptive statistics and multiple linear regression were used. According to the conclusions of the study, the growth of Kenya's financial system was significantly impacted by three factors: the number of agents, the volume of agency banking transactions, and the value of agency banking transactions. This study distinguished economic growth as a separate concept from economic growth, the latter of which would be the subject of the study.

Sindani, Muturi, and Ngumi (2019) examined the correlation between the growth of financial distribution channels and the rate of financial inclusion in Kenya during a six-year period, from 2012 to 2017. In particular, the following are some of the objectives of this study: Examine the ways in which the growing popularity of online banking and automated teller machine use in Kenya have contributed to that country's increasingly high rate of financial inclusion. Information gleaned from secondary sources has been compiled for use in further research. The results of the research are presented in frequency tables, percentages, and averages, all of which are derived from the data that was studied. The final categories in this study were generated using descriptive statistics. The functions of the dependent and independent variables were characterized by calculating their means, standard deviations, and variances. This study's results suggest that internet banking in Kenya benefits the financial sector as a whole by increasing productivity and efficiency. In addition, the introduction of ATM banking has helped increase financial inclusion in Kenya. This research looked at financial inclusion, which is a distinct notion from economic growth, which is the topic that will be covered in the next study.

Ogweno (2019) sought to examine the potential impact of fintech adoption on the bottom lines of Kenya's supervised MFIs. As of December 31st, 2018, the sample

population for this study included 13 MFIs that had been granted licenses. Secondary data were gathered on a yearly basis from 2014 through 2018 for a total of five years. The relationship between the variables was analyzed using a descriptive cross-sectional strategy, with the use of a multiple linear regression model. The size of the bank, the number of deposit accounts, and the number of mortgage accounts were all shown to have positive values that were statistically significant in the research. The size of the banks was another factor that was investigated in this research. According to the findings of the research conducted, factors such as agency banking, the accessibility of ATMs, and enough capital do not have a major impact on the financial success of regulated MFIs. This research concentrated on MFIs and therefore need for a study focusing on the economy as a whole.

2.5 Summary of the Literature Review and Research Gaps

The theoretical reviews showed the predicted relation between fintech and economic growth. Major influencers of economic growth have been discussed. From the reviewed studies, there is a knowledge gap that needs to be filled. From the studies reviewed, there are varied conclusions regarding the relation between fintech and economic growth. The differences from the studies can be explained by conceptual, contextual and methodological gaps.

Conceptually, most of the studies conducted locally have operationalized financial technology in different ways, with the majority choosing for a restricted definition. There are also methodological gaps that arise from previous studies conducted locally; most of them were conducted for a short period of time (mostly five years) which might not be adequate to capture the effect of financial technology on financial performance. The current study considered a 10 year period with data collected

quarterly. Further, most of the local studies have relied on primary data while the current study made use of secondary data that was considered more objective.

2.6 Conceptual Framework

Displayed in figure 2.1 is the predicted relation between the variables. The predictor variable was fintech given by the volume of transactions via mobile apps, internet banking, agency banking and Mpesa. The control variables were inflation given by inflation rate, and unemployment given by unemployment rate. The response variable was economic growth given by GDP growth rate.

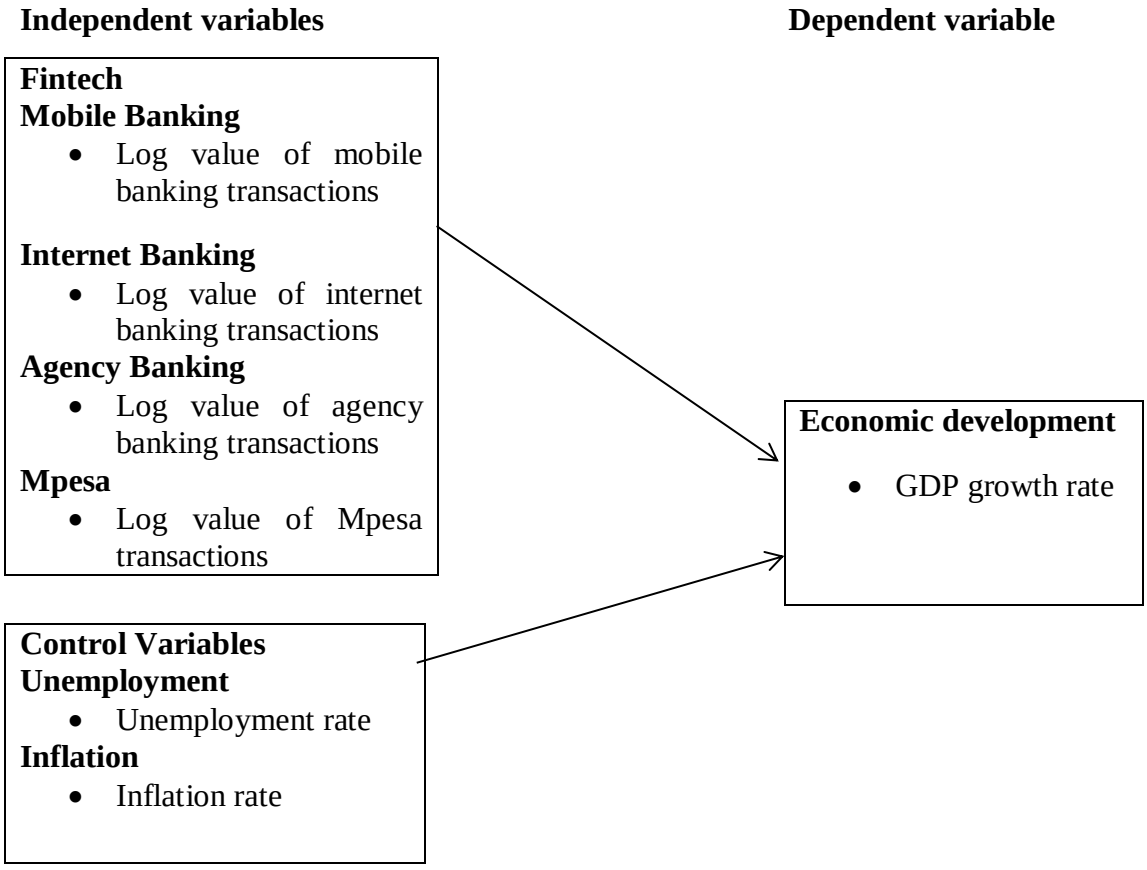

Figure 2.1: The Conceptual Model

Source: Researcher (2022)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the research design which was used is explained, in addition the approaches and procedures of collecting data are expounded on and finally the chapter explain how the data collected was analysed.

3.2 Research Design

A descriptive research design was used for this investigation. Examining the relationship that exists between fintech and economic growth was the focus of this descriptive study's main objective. Given that the researcher was primarily interested in the phenomenon's fundamental characteristics, this approach was appropriate. It was also effective for defining the phenomena' interconnections. This design also represented the variables precisely and legitimately, yielding sufficient data to answer the research objectives.

3.3 Data Collection

This study relied on secondary data. The secondary data was retrieved from KNBS publications and from the CBK website. The quantitative data collected included number of transactions through Mpesa on a quarterly basis, number of transactions through agency banking outlets in the country, number of transactions through mobile banking, number of transactions through internet banking, and the average bank lending rate which were collected from CBK website. Data on GDP growth rate and inflation were collected from KNBS on a quarterly basis. The secondary data was collected for a period of 10 years from January 2012 to December 2021 on a quarterly basis. The study period has been selected as this is the period that has experienced heightened adoption of fintech.

3.4 Data Analysis

In data analysis, version 24 of SPSS software was used. Tables presented the findings quantitative manner. Descriptive statistics were employed in the calculation of central tendency measures as well as dispersion such as mean as well as standard deviation for every variable. Inferential statistics relied on correlation as well as regression. Correlation determined the magnitude of the affiliation between the variables in the research and a regression determined cause and effect among variables. A multivariate regression linearly determined the relation between the dependent and independent variables.

3.4.1 Diagnostic Tests

The linear regression was based on a number of assumptions including linearity, no auto-correlation, no or little multi-collinearity, homoscedasticity and multivariate normality. The diagnostic tests performed are outlined in Table 3.1

Table 3.1: Diagnostic Tests

Test	Meaning	Statistical method	Interpretation	Diagnosis
Autocorrelation	Occurs when the residuals lack independence from each other.	Durbin-Watson statistic	When the test outcomes fall within critical values (1.5<d<2.5) there is no autocorrelation	Correlogram (Auto Correlation Function-ACF plot) Review model specifications
Multicollinearity	How closely related are the independent variables of the study	Variance Inflation Factors (VIF)	VIF less than 10 implies that there is no Multicollinearity	Data that was causing Multicollinearity was adjusted using log transformation
Stationarity	a unit-root test to establish if the data was	Jarque Bera unit root test	A p value less than 0.05 implies that the data is stationary	Robust standard errors were utilized wherever data

	stationary			failed the test.
Normality Test	When linear regression analysis for all variables is multivariate normal	Goodness of fit test Shapiro-Wilk test	Kolmogorov-Smirnov test prob.> 0.05. If the test is not substantial, the distribution is possibly normal.	Data that was not normally distributed was adjusted for using log transformation and non-linear log transformation.

3.4.2 Analytical Model

The following equation will be applicable:

$$Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \beta_4X_4+ \beta_5X_5 + \beta_6X_6 +\varepsilon$$

Where: Y = Economic growth given by GDP growth rate on a quarterly basis

β_0 =y intercept of the regression equation.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ =are the regression coefficients

X_1 = Mobile banking given by log value of mobile banking transactions

X_2 = Internet banking given by log value of internet banking transactions

X_3 = Agency banking given by log value of agency banking transactions

X_4 = Mpesa given by log value of Mpesa transactions per quarter

X_5 = Unemployment as given by quarterly unemployment rate

X_6 = Inflation as measured by the quarterly inflation rate

ε =error term

3.4.3 Tests of Significance

Parametric tests determined the general model and variable's significance. The F-test determined the model's relevance and this was achieved using ANOVA while a t-test determined the relevance of every variable.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND FINDINGS

4.1 Introduction

This chapter presents the analysis, results and discussions of this research. The main aim of the study was to determine how financial technology influences economic growth in Kenya. The following sections consist of descriptive statistic, diagnostic test, analysis of correlations, regression, and discussion of results.

4.2 Descriptive Analysis

Descriptive statistics of all variables on which analysis was done are listed in the table below. Quarterly information was gathered and analyzed using SPSS version 24 software during a ten-year period (2012 to 2021).

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Economic growth	40	-4.1	11.0	4.453	2.4892
Mobile banking	40	16.08845	17.86842	17.0973090	.41499020
Internet banking	40	6.92952	7.37588	7.2117545	.13803791
Agency banking	40	10.16416	12.32760	11.5620540	.64442336
Mpesa	40	5.18178	6.51915	6.1663730	.34060227
Unemployment rate	40	.0919	.1232	.108315	.0081762
Inflation	40	3.5	16.9	6.435	2.3729
Valid N (listwise)	40				

Source: Research Findings (2022)

4.3 Diagnostic Tests

Diagnostic tests were done before even handling the regression model. Normality, Multicollinearity, autocorrelation, and stationarity tests were conducted in the survey.

4.3.1 Normality Test

To see if they had a normally distributed data, the researcher used the Shapiro-Wilk test. If the p-value falls above 0.05, we conclude that there is normal distribution of data and vice versa. Table 4.2 summarizes the results of the test. Since the data displayed a p value of above 0.05 therefore having a uniform distribution, the researcher adopted the alternative hypothesis. This data was fit to be subjected to tests and analysis like for variance, regression and Pearson's Correlation analyses.

Table 4.2: Normality Test Results

	Shapiro-Wilk	**P-value**
Economic growth	0.869	0.178
Mobile banking	0.903	0.199
Internet banking	0.918	0.202
Agency banking	0.881	0.194
Mpesa	0.874	0.191
Unemployment rate	0.892	0.201
Inflation	0.923	0.220

Source: Research Findings (2022)

4.3.2 Multicollinearity Test

In a multiple regression model, multicollinearity is displayed whenever predictor variables exhibit a substantial relationship. An event where independent variables have great correlations is unfortunate. Parameters are said to have multicollinearity if they have a perfect linear connection. Outcomes for the test on multicollinearity were displayed in Table 4.3.

Table 4.3: Collinearity Statistics

	Collinearity Statistics	
	Tolerance	**VIF**
Mobile banking	0.432	2.315
Internet banking	0.511	1.957
Agency banking	0.387	2.584
Mpesa	0.476	2.141
Unemployment rate	0.642	1.558
Inflation	0.701	1.427

Source: Research Findings (2022)

VIF value is used where values that fall below 10 are not multi-linear. One condition for multiple regressions to occur is that no strong connection should be evidenced among variables. Given by the outcomes, every VIF variable is below 10 as indicated in table 4.3 which shows that independent variables in the study experience no significant statistical multi-linearity.

4.3.3 Autocorrelation

A serial correlation test established the relationship of error terms for different times. For the research to obtain the desired model parameters, the Durbin Watson serial correlation test was used to carry out the analysis of autocorrelation in the data, which is a major shortcoming in the data analysis that must be examined. The findings are shown in Table 4.4.

Table 4.4: Autocorrelation Results

Durbin Watson Statistic
1.837

Source: Research Findings (2022)

From the null hypothesis, no first-order serial/auto correlation exists. The 1.837 Durbin Watson statistical varies from 1.5 to 2.5 indicating no serial correlation.

4.3.4 Stationarity Test

The research variables were subjected to a unit-root test to establish if the data was stationary. The unit root test was ADF test. With a standard statistical significance level of 5%, the test was compared to their corresponding p-values. In this test, the null hypothesis states that every variable has a unit root, and the alternative hypothesis is that the variables are stationary. Findings depicted in Table 4.5.

Table 4.5: Stationarity Test

Variables	Statistic	P-value
Economic growth	7.2367	0.0000
Mobile banking	8.2031	0.0000
Internet banking	7.8718	0.0000
Agency banking	6.8447	0.0000
Mpesa	6.8132	0.0000
Unemployment rate	7.3854	0.0000
Inflation	5.9362	0.0000

Source: Research Findings (2022)

As demonstrated in Table 4.5, this test concludes that the data is stationary at a 5% level of statistical significance since the p-values all fall below 0.05.

4.4 Correlation Analysis

Pearson correlation was employed to establish the relationship linking economic growth in Kenya to mobile banking, internet banking, agency banking, Mpesa, unemployment rate, inflation and economic growth. The results are as shown in Table 4.6.

Table 4.6: Correlation Analysis

		Economic growth	Mobile banking	Internet banking	Agency banking	Mpesa	Unemployment rate	Inflation
Economic growth	Pearson Correlation	1						
	Sig. (2-tailed)							
Mobile banking	Pearson Correlation	.600**	1					
	Sig. (2-tailed)	.000						
Internet banking	Pearson Correlation	.615**	.913**	1				
	Sig. (2-tailed)	.000	.000					
Agency banking	Pearson Correlation	.585**	.949**	.982**	1			
	Sig. (2-tailed)	.000	.000	.000				
Mpesa	Pearson Correlation	.737**	.932**	.968**	.963**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
Unemployment rate	Pearson Correlation	-.359*	-.071	-.129	-.094	.191	1	
	Sig. (2-tailed)	.023	.665	.429	.564	.239		
Inflation	Pearson Correlation	-.677**	-.516**	-.478**	-.418**	-.581**	-.304	1
	Sig. (2-tailed)	.000	.001	.002	.007	.000	.056	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
c. Listwise N=40

Source: Research Findings (2022)

From the study's findings, a strong positive that is statistically significant relationship exists between mobile banking and economic growth (r = .600, p = .000). The correlation results further revealed a strong positive and significant statistical connection between internet banking and economic growth (r = .615, p = .000); agency banking and economic growth (r = .585, p = .000); Mpesa and economic

growth (r = .737, p = .000). Unemployment rate and inflation and exhibited a negative and significant association with economic growth in Kenya as evidenced by (r = .359, p = .023) and (r = -.677, p = .002) respectively.

4.5 Regression Analysis

Mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation were utilized as agents to predict economic growth in Kenya. The test was done at 5% level of significance. Table 4.7 to 4.9 displays the results.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.997[a]	.995	.993	.00066835

a. Predictors: (Constant), Inflation, Unemployment rate, Agency banking, Mobile banking, Mpesa, Internet banking

Source: Research Findings (2022)

The R squared indicator indicates how the explanatory variables may describe variations in the response variable. As indicated in Table 4.7, the R square was 0.995, indicating that change in mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation account for 99.5 percent of Kenya's economic growth with other factors ignored in the research accounting for 0.5 percent of the variance in economic growth in Kenya. The correlation coefficient (R) of 0.997 showed a significant connection amongst predictor factors and economic growth.

Table 4.8: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.034	6	.006	18.454	.000[b]
	Residual	.010	33	.000		
	Total	.044	39			

a. Dependent Variable: Economic growth

b. Predictors: (Constant), Inflation, Unemployment rate, Agency banking, Mobile banking, Mpesa, Internet banking

Source: Research Findings (2022)

The value of P obtained by ANOVA is 0.000, which is less than p=0.05. This demonstrates that the model's importance described how mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation affect Kenya's economic growth.

The relevance of various variables was determined using the model coefficients. The statistics of t and values of p were used to accomplish this. This study is significant since it allowed the researcher to determine which independent variables were chosen (mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation) significantly influences the economic growth of the Kenyan economy. The importance of the association between the two variables was shown by the sig. column's p-value. With a confidence level of 95%, a p-value of less than 0.05 was judged to be statistically significant, which is the most conservative estimate. Table 4.9 summarizes the findings.

Table 4.9: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.137	.047		-2.856	.007
	Mobile banking	.760	.002	.758	7.384	.000
	Internet banking	.294	.008	.286	2.074	.046
	Agency banking	.005	.002	.007	.046	.964
	Mpesa	.446	.004	.446	4.413	.000
	Unemployment rates	.024	.000	.024	1.273	.212
	Inflation	-.437	.000	-.437	-4.013	.000
a. Dependent Variable: Economic growth						

Source: Research Findings (2022)

Table 4.9 shows that mobile banking; internet banking and Mpesa had a sizeable positive impact on economic growth as indicated by positive coefficients and p values less than 0.05. Inflation was established to possess negative and considerable outcome on economic growth, as shown from the negative coefficient and a p value less than 0.05.

The following regression was estimated:

$Y = -0.137 + 0.760X_1 + 0.294X_2 + 0.446X_3 - 0.437X_4$

Where,

Y = Economic growth

X_1= Mobile banking

X_2= Internet banking

X_3= Mpesa

X_4= Inflation

Using the constant = -0.137, we can conclude that if selected independent variables (mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation) were rated zero, economic growth would be -0.137. Increasing mobile banking by one unit would increase economic growth by 0.760 units; increasing internet banking by 1 unit would increase economic growth by 0.294 while increasing Mpesa by one unit would cause the economic growth to increase by 0.446. Increasing inflation by 1 unit would lead to a fall in economic growth by 0.437 units.

4.6 Discussion of Research Findings

This research had an aim of establishing the way in which the predictor variables impacted the economic growth in the Kenyan context. Independent variables included mobile banking, internet banking, agency banking, Mpesa, unemployment rate and

inflation. This research tried to show economic growth being a dependent variable. The ratio of credit to the private sector as a proportion of GDP measured economic growth. Correlation as well as regression analysis were utilized to show the connection linking the independent to dependent variables.

The Pearson model showed a strong positive that statistically significant relationship exists between mobile banking and economic growth. The correlation results further revealed a strong positive and significant statistical connection between internet banking and economic growth; agency banking and economic growth and Mpesa and economic growth. Unemployment rate and inflation exhibited a negative and significant association with economic growth in Kenya.

The independent variables accounted for 99.5% of variances in economic growth, in accordance with the summary of the model. The predictor variables of this research had explanatory power that fitted a 95% confidence level like indicated by the 0.000 p value, which was below the threshold of significance that is 5%. Therefore, the overall model employed in this study is a good and sufficient prediction model to determine the economic growth in Kenya.

This research is in agreement with Misati, Osoro and Odongo (2021) who evaluated the impact of financial innovation on financial inclusion and economic growth in Kenya. They employed autoregressive distributive lag models. Real gross domestic product (GDP) and Credit to private sector indicators were used to measure economic growth and financial depth respectively. The results reveal that mobile transactions in value, the number of mobile agents and internet have significant positive impact on economic growth. The findings further reveal that the impact of innovations on economic growth is indirect through financial depth channels. They therefore

concluded that investment in cost effective innovation will be key determinant of bank's profitability.

The research is also in agreement with Bochaberi and Job (2021) who were interested in determining how its use has impacted the bottom lines of commercial banks. The Equity bank Kenya limited, the Co-operative bank of Kenya limited, the KCB bank Kenya limited, and the Family bank Kenya limited were the primary commercial banks in Kenya that were analyzed for the purpose of this research. The researcher relied on a descriptive approach for the technique of investigation. The study was conducted using the technique of purposive sampling, and the participants and respondents who were selected to take part provided the essential information. According to the conclusions of the study, the introduction of mobile banking has had an effect on each of the four most significant commercial banks in Kenya.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The major motive of this study was to investigate the way financial technology influences the economic growth in Kenya. The findings from the above sections are outlined in this chapter together with the conclusions and limitations of this study. This section also outlines the recommendations that can be adopted by policymakers. It also outlines the areas for further research.

5.2 Summary of Findings

The study assessed how financial technology influenced the economic growth in Kenya. Mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation were adopted to be the predictor variables of the research. The study used descriptive design to do analysis and data collection. Secondary data was obtained from CBK as well as KNBS and prepared using SPSS version 24 program. The study used data of 10 years compiled quarterly.

The findings revealed a strong positive that statistically significant relationship exists between mobile banking and economic growth. The correlation results further revealed a strong positive and significant statistical connection between internet banking and economic growth; agency banking and economic growth and Mpesa and economic growth. Unemployment rate and inflation exhibited a negative and significant association with economic growth in Kenya.

The R-square coefficient was 0.995, meaning that the selected predictors can explain 99.5% of economic growth in Kenya, with 0.5% of growth changes relating to factors

not considered in this research. This study showed that independent factors together had a significant effect on economic growth. ANOVA stresses that the F statistic with p=0.000 is significant at 5 percent demonstrating that the model had the capability to capture independent variables effect on the economic growth in Kenya.

The regression results further discovered that if the selected independent variables (mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation) were rated zero, economic growth would be -0.137. Increasing mobile banking by one unit would increase economic growth by 0.760 units; increasing internet banking by 1 unit would increase economic growth by 0.294 while increasing Mpesa by one unit would cause the economic growth to increase by 0.446. Increasing inflation by 1 unit would lead to a fall in economic growth by 0.437 units.

5.3 Conclusion

The outcomes of this study show that the economic growth in Kenya is positively influenced by mobile banking. This study concludes that increasing mobile banking uptake causes a rise in economic growth. The researcher concluded that internet banking has a significant positive influence on economic growth implying that internet banking uptake leads to economic growth. This study also finds that Mpesa carries a considerable positive impact on economic growth in the country. Inflation was found to have a significant negative effect on economic growth and so it is concluded that high inflation slows economic growth.

The study concludes that the factors under research – mobile banking, internet banking, agency banking, Mpesa, unemployment rate and inflation – affect economic growth by describing 99.5% of the variations. This means that the non-model variables are only responsible for 0.5% of variations of economic growth in the

country. It is therefore substantial to infer that the outlined factors affect the economic growth as shown in the ANOVA summary by p values less than 0.05.

The conclusions of this research concurred with Misati et al. (2021) who evaluated the impact of financial innovation on financial inclusion and economic growth in Kenya. They employed autoregressive distributive lag models. Real gross domestic product (GDP) and Credit to private sector indicators were used to measure economic growth and financial depth respectively. The results reveal that mobile transactions in value, the number of mobile agents and internet have significant positive impact on financial deepening. However, with advancement in mobile and agency banking models, bank branches have negligible contribution to financial inclusion. The findings further reveal that the impact of innovations on economic growth is indirect through financial depth channels.

5.4 Recommendations

Outcomes show that mobile banking possesses a positive and significant impact on economic growth in Kenya implying a rise in mobile banking uptake leads to a rise in economic growth. This research recommends the need for policy makers to create a conducive environment for financial institutions to enhance their mobile banking offering as this will enhance economic growth. The policy makers should also work on lowering the risks associated with mobile banking as this will increase confidence among the consumers.

This study revealed a positive and significant impact of internet banking on economic growth in Kenya implying a rise in internet banking uptake leads to a rise in economic growth. This research recommends the need for policy makers to create a guideline to enable financial institutions enhance their internet banking offering as this will

accelerate economic growth. The policy makers should also work on lowering the risks associated with internet banking as this will increase confidence among the consumers.

This study also demonstrated that Mpesa impacts positively on economic growth. This implies that higher Mpesa transactions are likely to enhance economic growth in the Kenyan economy. The research suggests the need for policymakers in Kenya to make sure that the drivers of Mpesa are addressed to enhance sustainable growth which will then lead to a rise in economic growth.

This study has demonstrated that the rate of inflation has a negative and significant effect on the economic growth in the country. It therefore recommends that several approaches are required to make sure that the factors that lead to rise in inflation are well handled to make sure that the inflation does not negatively influence economic growth. The government should work on lowering the cost of production that brings about cost push inflation while at the same time ensuring sufficient supply of goods and services as this reduces the possibility of demand pull inflation.

5.5 Limitations of the Study

This study embraced a 10 years period (2012-2021). It gives no substantial evidence that in an added timeframe, the findings will not change. Additionally, it is not certain that these findings will be sustained after 2021, things might change. Extra timeframe is reliable because it comprises instances with economic shifts like recessions and booms.

The main drawback of the study was the quality of data. It is not possible to reliably state the results obtained in the survey as the correct reflection of the general situation. Accuracy and reliability of the data collected are assumed to a certain point.

Additionally, this study uses secondary data as opposed to primary data which is first-hand information. Further, the determinants of economic growth are many but only six were considered because of unavailability of data for all determinants.

Regression models were used in data analysis. It would be impossible for the researchers to generalize outcomes because of the setbacks accruing from utilizing regression model like erroneous and misleading conclusions resulting from a change in value of variable. Outliers are known to affect the standard errors in a regression model leading to erroneous conclusions.

5.6 Suggestions for Further Research

The aim of the study was to determine the impact financial technology on economic growth of the Kenyan economy. A research that focuses on primary data or a mix of primary data with secondary data is recommended so as to recognize qualitative elements that might have been overlooked in the current research. A qualitative study can also be conducted to compliment the findings of this study.

This research failed to consider all independent variables that affect economic growth of an economy. A suggestion therefore arises to include other factors in future studies in order to come up with more comprehensive findings. These factors include unemployment, money supply, corruption, financial literacy among others. Providing details how each of them affects economic growth will enable policymakers to make a decision on the steps to take to enhance economic growth.

This study focused on the latest 10 years. Other future studies should employ a wider range to come up with a valid conclusion. This study was also under restriction because it only focused solely on Kenya. Additional survey should be conducted in other nations to determine results. Finally, the investigator adopted a regression model

to do a confirmation or rejection of the findings. Future studies should adopt other methods to confirm or reject their hypotheses.

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APPENDICES

Appendix I: Research Data

Year	Qr.	Economic growth	Mobile banking	Internet banking	Agency banking	Mpesa	Unemployment rate	Inflation
2012	1	3.9000	16.08845	6.92952	10.16416	5.18178	0.0919	16.8700
	2	4.8000	16.17037	6.93925	10.33644	5.30827	0.0938	11.7767
	3	5.0000	16.48467	6.96224	10.43620	5.45532	0.0968	6.3833
	4	4.5000	16.59342	6.96885	10.55111	5.59099	0.0984	3.5300
2013	1	3.6000	16.64967	6.98657	10.46061	5.76519	0.0985	4.0767
	2	4.7000	16.70269	7.02287	10.58519	5.84064	0.0987	4.3667
	3	3.7000	16.73890	7.03878	10.71126	5.87493	0.0993	6.9967
	4	3.2000	16.77494	7.05704	10.80255	5.92426	0.1001	7.4233
2014	1	4.9000	16.75759	7.06219	10.89505	5.94542	0.1001	6.7800
	2	5.9000	16.79477	7.09008	10.98578	5.95842	0.1028	7.0333
	3	5.1000	16.78883	7.11070	11.08167	5.97126	0.1037	7.5433
	4	4.3000	16.83317	7.14835	11.21681	5.98394	0.1044	6.1800
2015	1	4.8000	16.89971	7.14992	11.39696	6.01616	0.1045	5.8167
	2	5.0000	16.96879	7.16085	11.51316	6.07535	0.1053	6.9933
	3	4.7000	16.99509	7.18007	11.59192	6.13773	0.1056	6.1433
	4	5.3000	17.02979	7.20192	11.63153	6.20859	0.1057	7.3500
2016	1	3.8000	17.07465	7.21229	11.65361	6.21860	0.1063	7.0233
	2	3.8000	17.07211	7.23273	11.68174	6.23441	0.1065	5.3567
	3	4.4000	17.08456	7.25559	11.72629	6.25958	0.1071	6.3333
	4	4.8000	17.05015	7.27448	11.73294	6.28972	0.1071	6.5000
2017	1		17.05475	7.27517	11.75353	6.32257	0.1072	

Year	Qr.	Economic growth	Mobile banking	Internet banking	Agency banking	Mpesa	Unemployment rate	Inflation
		5.4000						8.7700
	2	3.3000	17.08769	7.28070	11.77712	6.33150	0.1072	10.7967
	3	3.2000	17.11258	7.29438	11.82081	6.35784	0.1083	7.5233
	4	3.5000	17.15064	7.32844	11.86580	6.37161	0.1094	4.9833
2018	1	5.2000	17.20870	7.33106	11.91098	6.38351	0.1097	4.4900
	2	6.1000	17.26147	7.33302	11.96735	6.39359	0.1114	3.9867
	3	5.3000	17.30724	7.33694	12.05249	6.40192	0.1114	4.6967
	4	6.0000	17.35429	7.34019	12.04317	6.40853	0.1121	5.6067
2019	1	4.8000	17.32758	7.32909	11.95185	6.41510	0.1126	4.3967
	2	6.0000	17.34841	7.33041	12.00326	6.42162	0.1136	5.5900
	3	5.0000	17.37512	7.32383	12.03293	6.42649	0.1140	5.0333
	4	4.6000	17.41536	7.32515	12.08173	6.43294	0.1165	5.4433
2020	1	4.4000	17.46704	7.32317	12.16551	6.44095	0.1174	6.2633
	2	(4.1000)	17.54199	7.32185	12.20852	6.44731	0.1179	5.3100
	3	(3.5000)	17.58784	7.32119	12.21637	6.45205	0.1188	4.3067
	4	2.3000	17.65399	7.31655	12.24532	6.46147	0.1191	5.2633
2021	1	2.7000	17.66349	7.32383	12.27146	6.46770	0.1210	5.7900
	2	11.0000	17.73447	7.32581	12.32760	6.47235	0.1224	5.9833
	3	9.3000	17.81897	7.34923	12.31571	6.48616	0.1228	6.6767
	4	7.4000	17.86842	7.37588	12.31567	6.51915	0.1232	5.9933