

**EFFECT OF DIGITALIZATION ON FIRM REVENUE GROWTH IN KENYA**

**BY**

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**DECLARATION**

I created this project entirely on my own, and it has never been submitted for credit at another university.

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



29<sup>th</sup> November 2022

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## **DEDICATION**

I dedicate this Research project to my Heavenly Father and my Family for their immensely support throughout the entire period of my learning.

## **ACKNOWLEDGEMENT**

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

<b>ATMs:</b>	Automated Teller Machines
<b>CBK:</b>	Central Bank of Kenya
<b>EU:</b>	European Union
<b>GDP:</b>	Gross Domestic Product
<b>GfK:</b>	Gesellschaft für Konsumforschung
<b>ICT:</b>	Information Communication Technology
<b>IT:</b>	Information Technology
<b>QR:</b>	Quick Response
<b>SACCOs:</b>	Savings and Credit Cooperatives
<b>SEO:</b>	Search Engine Optimization
<b>SMEs:</b>	Small and Medium Enterprises
<b>TAM:</b>	Technology Acceptance Model
<b>USAID:</b>	United States Agency for International Development
<b>VIF:</b>	Variance Inflation Factor



## ABSTRACT

Due to the availability of rapid and affordable communication between vendors, buyers, investors, and advertisements everywhere in the world, digital operations have completely changed the commercial sector. However, because many businesses are unaware of the potential of their digital power, there is a digital gap between consumers and retailers. This disconnect between customer expectations and retail offerings puts physical retailers' ability to make money from online sales at considerable risk, as well as their ability to respond to and predict customers' shopping habits. The study sought to determine how digitization has affected Kenyan corporate revenue growth. The specific aims were evaluating how website usage affects revenue growth of a firm in Kenya, the impact of internet usage on firm revenue growth in Kenya, and the Technology Acceptance Model guided the impact of mobile money usage on firm revenue growth in Kenya. The paper. The research used secondary panel data for 168 firms extracted from World Bank Enterprise Survey reports for two periods (2013 and 2018). The data was analyzed using panel regression procedures. The results showed that website usage had a positive and significant impact on Kenyan business revenue growth. The use of mobile money and the internet was also found to have a positive but negligible impact on Kenyan business income growth. The results further demonstrated that firm age and size had a positive impact on firm revenue growth in Kenya, more so the impact was also significant. Further findings showed that area, industry, and managerial experience all contributed positively but insignificantly to the rise of the firm's revenue in Kenya. According to the study, the use of websites in Kenya increased corporate revenue in a good and significant way. The study recommends that firms without websites should invest in developing company websites that will attract more business thus enhancing revenue growth. Firms with websites should invest in further improvement of the websites to incorporate changes within the firm or from external market. Firms should invest in digital oriented personnel to help in capitalizing on the gains of digitalization. The government of Kenya should review policies on digitalization aimed at making them friendly to firms. The government through relevant ministries should develop programs aimed at training firms on the importance of digitalization.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

There is a lot of scholarly interest in digitalization as the integration technologies, specifically digital technologies, into business processes, goods, and operations, especially in the retail industry (Rachinger et al., 2019). This digital service represents a new approach to financial inclusion and demonstrates how businesses and the wider economy can maximize revenue growth. They assist communities in become more resilient and self-sufficient (United States Agency for International Development [USAID], 2021a). Technological innovation has transformed the corporate world, enabling companies to better respond to changing market demands or improve institutional performance (Adeleye et al. 2019).

The development of digital finance has developed a national strategy in China, making it a driving force for supply-side structural reforms (Wu, 2019). The Search motor goliath Baidu 2015, revealed the world's first artificial intelligence park in Beijing. Chinese buyers have favored the new credit only ways, for example, versatile instalments through Quick Response (QR) codes and cell phone overcharge cards. This implies that online business sectors have gotten regular as the most utilized stage because of their customized benefits (Yao et al. 2018). The use of electronic card instalment items, likewise, saw an additional US\$ 983 billion to the GDP of 56 nations as of 2012 from the year 2008. Card instalment has raised utilization by a normal of 0.7 per cent across the 56 nations. The genuine worldwide GDP developed by a normal of 1.8 per cent during that time (Tee & Ong, 2016).

According to World Bank data, digital payments accounted for 23%, 79%, 30% and 60% of growing mobile and Internet penetration and payments in Egypt, Nigeria, Kenya, and South Africa respectively in the past year (World Bank, 2019). Fawry, Egypt's largest electronic payment network, was established in 2008 and currently serves over 20 million customers with over 2 million daily transactions. With 20% of the population of Egypt using the company's platform, Fawry enjoys a strong position in the country's payments business. Customers can make online purchases with Fawry Pay using the company's payment methods, which include credit cards, mobile wallets, and cash on delivery (FT Partners FinTech Industry Research, 2019).

Ebola control and rehabilitation operations in Sierra Leone and Liberia have been hindered by issues with compensating important groups, including health personnel and government officials. Stakeholders are aware that mobile money has the potential to make it possible for these groups to make payments in a safer, more effective, and sustainable way. The network of agents that facilitates mobile money deposits and withdrawals, however, is of very poor quality and coverage. This makes mobile money less viable as a distribution route (USAID, 2021b).

The integration of mobile money into the SACCO financial system benefits SACCO members by speeding the payment of SACCO salary to farmers and tea workers. As a result, there is more time to work on the tea plantations because there is less time spent traveling and waiting for paychecks. The quality and amount of tea harvested are positively impacted by this. Farmers and tea pickers have switched from using mobile money platforms to withdraw money from SACCO accounts to other services such as using mobile money platforms for commercial transactions, payments for products and services, and bill payments during the COVID-19 lockdown (USAID, 2021a).

Zimbabwe has increasingly incorporated digital finance in the form of Eco Cash, transforming how businesses are run (Masocha & Dzomonda, 2018). As of the year 2016, Zimbabwe implemented the National Financial Inclusion Strategy 2016-2020, which pointed toward overcoming any barrier experienced in real money deficiencies, confirmed by the long lines at certain banks, just as the shortage of accessibility of money on many Automated Teller Machines (ATMs) (Reserve Bank of Zimbabwe, 2016).

Kenya, which has the world's fourth fastest growing digital economy, has emerged as one of Africa's most important technology hubs. Due to the government's dedication to financial inclusion, the nation is among the most developed in Africa in terms of mobile payments, access to banking, and insurance services. Kenya already ranks among the top countries in the world for mobile money adoption, and its banking system is also quite developed. The country has a higher percentage of unbanked people than many other sub-Saharan African nations, which is partly because mobile banking services are becoming more widely used there. About 25% of Kenyans have mobile banking, and 8% of them have loans obtained through online applications (Safaricom, 2020).

## **1.2 Research Problem**

Due to the availability of rapid and affordable communication between vendors, buyers, investors, and advertisements everywhere in the world, digital operations have completely changed the commercial sector. As a result, conventional marketing and sales techniques are now more successful and efficient in the market. Institutions use technology to support their business processes, reduce costs, diversify revenue streams, and improve customer experience. As a result, having a highly developed digital financial system is expected to lead to productive and efficient economic growth in that country.

However, because many businesses are unaware of the potential of their digital power, there is a digital gap between consumers and retailers. The disparity between customer expectations and retail offerings poses a severe danger to total sales as well as the ability of physical establishments to respond to and anticipate the purchasing patterns of their customers. Despite the increase in revenue (including grants) by 1.9 percent to Kshs. 1,753.5 billion (17.2% of GDP) compared to the previous fiscal year, appropriations-in-Aid and tax revenues declined by 20.7 percent and 1.2 percent, respectively. Although they climbed by 5.4% to Kshs 2,565.4 billion (25.2% of GDP), government spending and net lending fell short of the planned aim. With such declines and unmet targets, the economy dips significantly forcing the country to fall into debt. The public and publicly insured external debt of Kenya also climbed to Kshs. 3,515.8 billion. This above informs this study, which aims at evaluating the degree of the influence of digitalization on company revenue growth in Kenya. It is a worry for the general public and for the sustainability of the economy. There exists limited empirical literature on the link between digitalization and firm revenue growth. This made it worthwhile for the researcher to investigate the role of digitalization on firm revenue growth in Kenya.

## **1.3 Research aim and Objectives**

### **1.3.1 Aim**

The study seeks to examine the effect of digitalization on firm revenue growth in Kenya.

### **1.3.2 Objectives**

- i. To investigate the effect of the use of websites on firm revenue growth in Kenya
- ii. To investigate the effect of the use of the internet on firm revenue growth in Kenya

- iii. To find out the how the use of mobile money affects the firm revenue growth in Kenya
- iv. To provide policy recommendations

#### **1.4 Study Significance**

This paper focus is very important to many stakeholders. The study's findings will be helpful to CBK authorities in the financial sector since they will speed up the implementation of policies geared toward digitization. The study findings will provide useful recommendations on various digital money to help the CBK maximize the technological advantage for revenue generation and economic growth in Kenya. Besides, the outcome of the study will also be important to the regulatory authorities in Kenya who will find the recommendations of the study valuable. They will be able to understand the modern applicable and effective measures to apply regarding monitoring and formulating policies around economic growth in Kenya.

Lastly, this research will be important for Kenyan scholars and researchers to advance educational research to fill the existing gap on the issue of digital money and income generation in Kenya. Academics, scientists and researchers will appreciate the source of knowledge from this research and will be able to update existing knowledge on the subject.

#### **1.5 Paper Organization**

Chapter two discusses the literature review, which covers the theoretical review, and empirical review. Chapter Three includes theoretical framework, econometric specification, data source, definition and measurement of variables and econometric issues. The fourth chapter present analysis of data and discussion. The overview of the results, the conclusion, and the policy recommendations are offered in Chapter 5.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

An overview of the existing research on the research challenge and goals is given in this chapter. In particular, a review of relevant theories informs the research variables, as well as the empirical literature to demonstrate hypothetical relationships and conceptualizations of research variables.

### **2.2 Theoretical Reviews**

#### **2.2.1 The model of Technology Acceptance**

The model of “Technology and Acceptance” (TAM) is a model created expressly to simulate user acceptance of information systems or technology. It was first presented by Fred Davis (Davis, 1989). In other words, by using the theory to describe a common ancestor of computer adoption, user behavior across multiple computing technologies and end-user populations is explained. The principles of the model have also been tested over the years and have proven their effectiveness in the current era of the financial sector. The struggle between technological development that is occurring quickly and barriers that exist naturally to the introduction of new goods or services determines how quickly payment systems evolve (Ozili, 2018).

Due to the fact that perceived advantages make it more likely for people to utilize information and communication technologies (ICTs), such as electronic payment systems, this raises questions about how user-friendly the systems are, which prompts a system review. Digital finance benefits include increased financial inclusion, the spread of financial services into non-financial sectors, the development of essential services for individuals, and revenue growth (Ozili, 2018). Therefore, this study intended to explore how digitalization has impacted corporate revenue development in Kenya utilizing theory as a foundation.

### **2.3 Empirical Review**

#### **2.3.1 Firm Revenue Growth**

Revenue growth shows an increase/decrease in sales from time to time. It is employed to gauge how quickly the company is expanding. Profits growth is more important as a representation of sales and helps investor’s spot trends to calculate earnings growth over time. The proportion

of the revenue of a company that differs between various comparable fiscal years (Chaniago, 2021).

The relationship between sales growth and Tobins Q of a listed manufacturing company in Nigeria was studied by Okerekeoti (2021). To analyze the data, descriptive and inferential statistics were utilized. According to research results, Tobin's Q and sales growth are significantly positively related. Based on the report, companies in the manufacturing industry need to keep a healthy working capital position and, in particular, offer credit to clients while targeting to increase sales.

The adoption of the method into the organization's production process has increased the company's turnover (Butali&Njoroge, 2019). Organizational performance is the product of individuals, groups, and/or organizations, claims Mahfouz (2019). In some industries, including those that manufacture goods, revenue growth is attained by enhancing the production process (Ogohi, 2018). Additionally, socioeconomic advantages, customer happiness, expansion prospects, and learning platforms can be used to assess the company's revenue growth (Rula, 2019).

In order for an organization to provide its best performance, it is necessary to build a value chain process by examining input from customers and other stakeholders who can play a role in increasing organizational resilience and driving efficiency in service delivery (Kasaya&Munjuri, 2018)). Gatama (2021) argues that ROA, ROI and other measures are important in performance assessment. As of the year 2016, Zimbabwe implemented the National Financial Inclusion Strategy 2016-2020, which pointed toward overcoming any barrier experienced in real money deficiencies, confirmed by the long lines at certain banks, just as the shortage of accessibility of money on many Automated Teller Machines (ATMs) (Reserve Bank of Zimbabwe, 2016).

Kenya, which has the world's fourth fastest growing digital economy, has emerged as one of Africa's most important technology hubs. Due to the government's dedication to financial inclusion, the nation is among the most developed in Africa in terms of mobile payments, access to banking, and insurance services. Kenya already ranks among the top countries in the world for mobile money adoption, and its banking system is quite developed. The country has a higher percentage of unbanked people than many other sub-Saharan African nations, which

is partly because mobile banking services are becoming more widely used there. Rehman et al. (2018) looked into how the performance of small and medium-sized firms is impacted by Pakistan's access to information technology. The moderating impact of corporate entrepreneurship is also looked at. They employed a cross-sectional survey approach to collect primary data from 420 respondents who were chosen using stratified sampling. The main tool for gathering data is the questionnaire. Data analysis methods included bivariate, multivariate, and univariate approaches. Information technology skills have been shown to significantly affect small and medium businesses' ability to expand their revenue.

Cesinger, Gundolf, and Géraudel (2018) investigated the possibility that the channel by which expansion ambitions influence earnings growth is growth in firm size. According to the examination of the data set of 20,472 French start-up companies, growth intention positively affects sales growth, company size increases positively impact sales growth, and firm size increases positively influence growth intention's impact on revenue growth. These findings imply that growing a company's size is a strategy for achieving revenue growth rather than a goal in and of itself.

The role of investment, income growth rate, firm size, and company performance are all examined by Eka (2018). This study uses a sample of 194 manufacturing companies registered on the Indonesia Stock Exchange to build a variable synthesis of sales growth rates that influence investments and company performance.

According to Ai et al. (2018), the growth of companies that use more intangible capital is facilitated by new enterprises with more overall technological capability since they are better equipped to adapt during the overall Covid-19 shock. Areas in the US with more enterprise IT use have lesser increases in unemployment, according to Pieri and Timmer (2020).

### **2.3.2 Use of Websites and Firm Revenue Growth**

Olonde (2017) looks into how digital marketing influences small and medium-sized enterprises in Nairobi, Kenya, to increase sales. The SMEs in Nairobi can be analyzed in this study using a descriptive cross-sectional approach at a certain time. The target group consists of 699 SMEs and the 100 SMEs that have grown the most in the last five years (sample of 255 SMEs). According to studies, social media marketing and email marketing both significantly affect SME revenue growth. This includes pay-per-click (PPC) advertising, internet marketing,



mobile marketing, and search engine optimization (SEO), all of which have a substantial impact on the growth of SME revenue. However, this study has a substantive gap as it focuses only on the revenue growth of SMEs in Nairobi, Kenya, but does not clearly focus on the revenue growth of enterprises in Kenya.

Duch-Brown et al. (2017) studied how internet sales affect customers and companies. The Gesellschaft für Verbraucherforschung (GfK) provided secondary data for this study that included price and sales statistics. The collection consists of 931,509 observations for notebooks, 24,939 observations for digital cameras, and 17,952 observations for portable media players. The findings indicate that market expansion and income divergence both have a large impact. Similar to this, consumers have profited more proportionately, and this is only because new means of distribution have emerged, not because there is now greater competition. The analysis also demonstrates that there is a significant pricing disparity between EU nations for similar goods in both traditional and online channels. However, this study has a substantive gap because it only focuses on European Union countries but does not clearly focus on the sales growth of companies in Kenya.

Kawira et al. (2019) assessed the performance of MSMEs in Kenya in relation to the effects of digital marketing. This study employed a descriptive research design that is grounded in positivist research theory. 8,526 MSMEs with licenses in the Tharaka-Niti district are included in the study population. A questionnaire and stratified and random sample techniques were used to collect the data. According to descriptive data on the relationship between digital marketing and MSME performance, the majority of MSME owners and managers who use digital marketing observe an improvement in the performance of their companies. The results of bivariate regression show that digital marketing considerably raises MSMEs' performance.

Wakonyo (2019) did study to determine how small and medium firms (SMEs) in Nairobi, Kenya are impacted by the use of social media networks for marketing. Data are gathered for this study using a questionnaire and a descriptive research approach. The research's target group, 699 small and medium-sized firms in Nairobi, was selected using a stratified random sampling technique. The study came to the conclusion that using social media networks effectively to sell services and goods for businesses results in higher revenue growth.

Achiando (2019) examines As of the year 2016, Zimbabwe implemented the National Financial Inclusion Strategy 2016-2020, which pointed toward overcoming any barrier experienced in real money deficiencies, confirmed by the long lines at certain banks, just as the shortage of accessibility of money on many Automated Teller Machines (ATMs) (Reserve Bank of Zimbabwe, 2016).

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Treimikien et al. (2021) looked at how social media affected marketing and sales in the entertainment sector. 385 individuals were questioned as part of the quantitative study. Based on the social media marketing communication paradigm utilized by entertainment industries, the quantitative research questionnaire was created. According to the survey, entertainment organizations utilize strategies including sales promotion, brand building, and maintaining connections with current and new corporate clients on social media to increase sales by fostering consumer involvement. Customers are more inclined to actively follow these kinds of accounts, so constant social media engagement from entertainment companies benefits sales.

Di Fatta, Patton, and Viglia (2018) identified and analyzed factors or combinations of features that boost conversion rates using 1,184 data from 6 SME websites. This was accomplished via a process that combined qualitative comparison analysis (QCA), which provided "fine" detail about the circumstances under which conversion rates improved, with exploratory regression

analysis, which helped identify the most important drivers. The findings demonstrate that a strategy that emphasizes quality or advertising and refrains from combining both features in site offerings is a critical element in raising conversion rates.

Li (2019) examines the link between internet usage and Belt and Road region economic expansion. Using a dynamic panel data technique, data were once gathered from each of the 65 nations in between 1996 and 2014 along the Belt and Road. This effect has been heightened by the expansion of the Internet. Variations in the Internet's effect on economic growth among the Belt and Road countries can be attributed to a wide range of factors, including capital, labor, technology, industrial structure, international trade, and economic level. Nonetheless, there are blind spots in the analysis due to its narrow focus on Belt and Road countries between 1996 and 2014 and its failure to analyze the rise in profits of Kenyan businesses.

This digital service represents a new approach to financial inclusion and demonstrates how businesses and the wider economy can maximize revenue growth. They assist communities in become more resilient and self-sufficient (United States Agency for International Development [USAID], 2021a). Technological innovation has transformed the corporate world, enabling companies to better respond to changing market demands or improve institutional performance (Adeleye et al. 2019).

The development of digital finance has developed a national strategy in China, making it a driving force for supply-side structural reforms (Wu, 2019). The Search motor goliath Baidu 2015, revealed the world's first artificial intelligence park in Beijing. Chinese buyers have favored the new credit only ways, for example, versatile instalments through Quick Response (QR) codes and cell phone overcharge cards. This implies that online business sectors have gotten regular as the most utilized stage because of their customized benefits (Yao et al. 2018). The use of electronic card instalment items, likewise, saw an additional US\$ 983 billion to the GDP of 56 nations as of 2012 from the year 2008. Card instalment has raised utilization by a normal of 0.7 per cent across the 56 nations

### **2.3.3 Use of the Internet and Firm Revenue Growth**

Based on data from Bangladesh, Islam et al. (2019) explore how the adoption of internet banking affects bank profitability. This study used a descriptive survey design and a structured questionnaire to obtain data from 650 respondents (sample 264). The findings demonstrate that

the Internet's usability, efficiency, and accessibility have a substantial influence on the standard of job performance in SMEs. This is due to the fact that clients may now do their banking online, saving both time and money, thanks to the usage of the Internet by businesses. However, the study presents a contextual gap since the study only drew evidence from Bangladesh but did not clearly focus the firm revenue growth in Kenya.

Rella (2019) studied the effect of internet banking and blockchain technologies on remittances. Through the use of time series data and a GAH research strategy, this study focuses on businesses engaged in infrastructure-related activities. The findings indicate that blockchain technology has the potential to increase financial inclusion and formalize remittances. It has also been noted that one of the greatest strengths of technology is that it can be shaped according to people's needs and preferences. In the past, expatriates usually waited until they had saved a significant amount before transferring it to their relatives to save on transfer fees. The advent of remittance technology has changed all that. People nowadays send and receive money with a few clicks on their mobile screen. Many countries have introduced government incentives and relaxed regulations to encourage the flow of remittances through technology-enabled legal channels. Digital inventions such as payment aggregators have also stepped up the global remittance game. However, this study has a substantive gap as it focuses on firms operating at the infrastructure level but does not clearly focus on corporate earnings growth in Kenya.

Sigilai (2020) examines how technological investment has affected the expansion of manufacturing companies in Kenya. The study's theoretical underpinnings are the theory of profit innovation, the profit risk and uncertainty theory, and the concept of innovation dispersal. Using information gathered from the World Bank and the Kenya National Bureau of Statistics, this study examines the impact that IT investment has had on manufacturing expansion in Kenya from 2011 to 2018. The results show that several IT tools, like MRP, CAD, CAE, and CI, are crucial to the success of modern manufacturing development, is used by Kenyan manufacturing enterprises. The expansion of industrial output is positively and significantly impacted by investments in information technology.

The effect of information technology on banking activities in Ghana is examined by Appiahene, Missah, and Najim (2019). The DEA model is utilized twice in this investigation. The Robust DEA suite is used to assess efficiency in R programming. The study's conclusions

suggest that IT significantly affects bank performance as a whole because many banks are operationally efficient while ignoring the efficiency of their respective savings and investments.

Gakuubi (2018) investigates how IT affects Kenyan logistics firms' success. To guarantee accurate and effective presentation of research variables, descriptive research design is employed. Enterprise resource planning programs assist businesses in streamlining their operations to boost efficiency, according to data on IT systems and competitive advantage. Radio frequency identification technology is widely used by businesses to track products and vehicles. The corporation heavily utilizes an enterprise resource planning methodology, and via effective information flow management, internal and external organizational processes have been greatly enhanced.

In Kenya, Chege, Wang, and Suntu (2020) looked into how entrepreneurial innovation capabilities affected the link between technical innovation and firm performance. An SEM was used to analyse data from 240 separate businesses. Based on the results, it can be concluded that technological innovation helps businesses succeed. The results of this research suggest that business owners should try new approaches to boost their companies bottom lines.

Chege and Wang (2020) evaluate the research on how technological innovation helps small businesses in developing nations create jobs. The pertinent information was combined using a seven-step literature review methodology. The findings demonstrate that technical innovation drives economic growth and positively affects employment creation in small enterprises. Small businesses' competitiveness and ability to access global markets are significantly impacted by their successful use of information technology.

Theorizing on the connection between digital mergers and acquisitions (M&A), the acquirer's shared digital knowledge base, and its effects on digital innovation and company performance is Hanelt, Firk, Hildebrand, and Kolbe's (2021) work. The largest automakers in the world provided a longitudinal data collection for this study, which used panel data regression. According to the report, doing digital mergers and acquisitions helps industrial-age businesses build their digital knowledge bases, enabling them to foster digital innovation. The findings also demonstrate that enterprises operating in the industrial age perform better commercially thanks to digital innovation.

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From 2012 to 2016, 39 African nations were studied by Solomon and van Cleeten (2020) to determine how the adoption of digital technologies affected economic growth. To determine how much the use of digital technology promotes growth, this study uses a systematic GMM estimator. An index Network One metric used to evaluate digitalization is readiness. In contrast to earlier studies, they made a distinction between the effects of ICT use on growth by people, corporations, and governments. Only individual submissions have a favorable impact, according to the data. According to a study of various uses, two additional factors that are essential for growth are the applicability of social media and ICTs to government vision.

In their study on the relationship between digitalization and economic growth in sub-Saharan Africa and the OECD's economy, Myovella, Karacuka, and Hakata (2020) compared the

economies of the two regions (SSA). This study used the generalized linear moment (GMM) method using a panel dataset with 11 years of data for 41 SSA and 33 OECD economies from 2006 to 2016. The study's findings demonstrate that the two categories of countries' economies benefit from digitization. SSA is less affected by broadband internet than OECD nations are, however SSA is more affected by mobile telecommunications than OECD nations. This result is very interesting because less sophisticated technology in LDC creates more opportunities because there is more room for improvement.

Jepchumba and Simiyu (2019) looked at how e-introduction banking's affected Kenyan commercial banks' financial results.<sup>41</sup> Kenyan commercial banks were surveyed using a standardized questionnaire as part of this study's descriptive research design. The study's findings demonstrate that using the internet significantly and favorably impacts financial performance. Online banking is more accessible and frequent than traditional banking, saves time, and causes costs for banks when it fails. This is because electronic banking systems are cheaper in terms of maintenance than fully functional offices, technology investment costs do not exceed bank profits, electronic banking saves on transaction costs and operational costs. This report offers important information and insights regarding how e-banking affects financial performance, but it makes no mention of how income is generated or grows from an economic standpoint.

Nazaritehrani and Mashali (2020) evaluated the effects of cutting-edge channels on bank market share, including internet banking, ATM, mobile banking, telephone banking (TB), and point of sale (POS). The research population is the Tehran, Iran, headquarters and branches of the Shahr Bank, and the respondents were contacted by way of a questionnaire. The study's findings indicate that TB, POS, and online banking have a favorable impact on the bank's market share. The study, however, contains significant gaps because it concentrates on the situation of Shahr Bank's head office in Tehran, Iran, rather than on the firm's revenue development in Kenya.

#### **2.3.4 Use of mobile money and Firm Revenue Growth**

The development of mobile money and its crucial contribution to increasing financial inclusion in Kenya are examined by Aron (2018). From a micro perspective, it looks at the channel of mobile money's economic impact. Mobile money appears to encourage risk sharing, but there

is little concrete evidence that it encourages wealth or savings. Mobile money storage and payment systems, as well as the broader connections they have to microinsurance, algorithmic credit ratings, and bank savings accounts, can have an impact on consumers and businesses in a number of ways. In poor nations, mobile money can assist address some market failures. The influence of mobile money on financial inclusion is clearly demonstrated by this study, but it does not address income generation and growth from an economic standpoint.

According to Skogqvist (2019), the use of mobile money has a negative impact on rural inhabitants, low-income women, and those with low levels of education when it comes to their income and saving habits, which can lead to financial exclusion. This study uses a FinAccess household survey of a population of 8,665 households in Kenya. The findings indicate that mobile money users are 1.96 times more likely than non-users of mobile money to have a savings product, and that mobile money users are 1.44 times more likely than non-users to save for emergencies and future events. These findings demonstrate that users of mobile money view it as a dependable, efficient, and valuable source of value, particularly when it comes to building savings for the future. This study is highly helpful since it gives researchers an empirical path to show how mobile money affects company revenue growth in Kenya.

Tengeh and GahapaTalom (2020) looked at the characteristics that influence SME adoption and use of mobile money services (MMS), the kinds of MMS that these SME users use, and the interactions between these variables. In the qualitative phase, representatives from 12 SMEs were interviewed to confirm the 285 SMEs that were interviewed in the quantitative part of the study. Accessibility, security, and convenience seem to be the main drivers encouraging SMEs in Douala, Cameroon to use mobile money services to receive payments from customers, pay suppliers, and conduct transactions using over-the-air time, even though no single cause is to blame. Additionally, the turnover of SME businesses is impacted by the use of mobile money.

Asamoah et al. (2020) assessed the effect of mobile remittance capabilities on the growth of micro-enterprises and the impact this has on the welfare of micro-entrepreneurs, which is called the “developmental impact” in this study. Research models are created through the theoretical lens of dynamic capability theory. A survey method was used to gather data from 201 MMT microenterprises operating in Ghana, a sub-Saharan African nation, in order to test the concept. To examine the data, structural equation modeling is employed. According to the study's



findings, an entrepreneur's mobile money skills—defined as those needed to conduct mobile money transactions—are considerably positive indicators of business success.

Mawejje and Lakuma (2019) looked at how mobile money affected Uganda's financial sector's growth. The VEC (Vector Error Correction) method is then used to examine the long-term demand function of mobile money. The findings indicated that the money supply, the consumer price index, private sector lending, and macroeconomic activity were all somewhat positively impacted by mobile money. Mobile money balances react to changes in monetary policy tools and suggest a potential easing effect on how monetary policy is applied. Furthermore, the research results show that the mobile money transaction motive has a stronger macroeconomic effect than the saving motive. However, the study has a substantial gap as it focuses on the case of the Ugandan financial sector but does not clearly focus on the revenue growth of companies in Kenya.

Patnam and Yao (2020) analyze how mobile money affects India's economic performance. The findings demonstrate that mobile money use boosts shock resistance by minimizing the effects of precipitation shocks on household consumption and nightlight-based economic activity. According to the findings, businesses who take mobile payments saw an increase in sales compared to other businesses after using them for six months. However, the study has a substantial gap as it focuses on the case of the Indian financial sector but does not clearly focus on the revenue growth of companies in Kenya.

## **2.4 Overview of Literature Review**

The chapter reviewed theory anchoring this study. TAM specially designed to model user acceptance of information systems or technology. The model supports the use of technology such as mobile money, which is expected to enhance firm revenue growth. Furthermore, review of previous studies on the subject matter revealed that most of the existing studies have been conducted in contexts that are different from the local context, thus making it impractical to generalize the findings. By concentrating on the Kenyan setting, the current research intended to fill the knowledge gap that exists in the field.

## CHAPTER THREE: METHODOLOGY

### 3.1 Introduction

This chapter presents the methods that guided the paper. It discusses the theoretical framework of research, specifications of econometrics, data sources, construct measurement, and econometric problems.

### 3.2 Theoretical Framework

This study followed the profit maximization framework. According to neoclassical business theory, maximizing profits is the basic objective of business. When these requirements are met, a company optimizes its profitability:

- (i)  $MC = MR$  and,
- (ii) MC Curve cuts the MR curve from below.

Maximum profit refers to the net profit that exceeds the average production cost. This sum represents what the business owner keeps after paying for all inputs, including his manager's salary. In other words, it is extra revenue from residual sources. The following might be described as the requirement for maximizing the company's profit:

Where  $\pi (Q) = R (Q) - C (Q)$

Where  $\pi (Q)$  is profit,  $R (Q)$  is revenue,  $C (Q)$  are costs, and  $Q$  are the units of output sold.

The profit maximization framework is founded on the following presumptions: the firm's objective is to maximize profits, which are defined as the difference between revenues and costs; The company's sole owner is also the lone employee, and the business is well aware of the volume of production that can be sold at any price. Consumer tastes and habits are also reliable and enduring.

### 3.3 Econometric Specification

Based on the aforementioned framework, this study defines the following panel model to examine how digitalization has affected business revenue growth in Kenya:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \epsilon_{it} \quad (1)$$

Where;

$Y_{it}$  = Revenue of firm  $i$  at period  $t$

$X_{1it}$  = Use of website by firm  $i$  at period  $t$

$X_{2it}$  = Use of internet by firm  $i$  at period  $t$

$X_{3it}$  = Use of mobile money by firm  $i$  at period  $t$

$i$  -denotes firm

$t$  - denotes period (year)

$\beta_0$  - Constant

$\beta_1 - \beta_3$  = Beta coefficients

$\epsilon_{it}$  = Error term

Introducing control variables, the model becomes;

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8it} + \epsilon_{it} \quad (2)$$

Where;

$X_{4it}$  = Age of firm  $i$  at period  $t$

$X_{5it}$  = Size of firm  $i$  at period  $t$

$X_{6it}$  = Sector of firm  $i$  at period  $t$

$X_{7it}$  = Region of firm  $i$  at period  $t$

$X_{8it}$  = Managerial experience of firm  $i$  at period  $t$

Panel data analysis is appropriate when examining two-dimensional (cross-sectional and longitudinal) panel data (Raharjo et al., 2018). Data is often collected over time and for the same firms, and then broken down into these two dimensions. Panel data can model the

behavior of groups and individuals collectively. This study collected data for two periods (2013 and 2018) and over the same firms (168 firms) and then a regression was run over these two dimensions. Pure time series or cross-sectional data are less useful than panel data since they are less adaptable and have less information. The problem with using OLS to model panel data is that it does not account for fixed and random effects.

### 3.4 Data Source

The research used secondary panel data for 168 firms extracted from World Bank Enterprise Survey reports for two periods (2013 and 2018). Data on the study variables – firm revenue, use of websites, use of internet and use of mobile money was extracted from the mentioned sources. Firm revenue was transformed to natural logarithm since annual sales were not normally-distributed but log sales was normal. Besides, sales values were very large in comparison to the other variables, and; hence, it was necessary transforming the data on sales. Data was analyzed with the aid of STATA software.

### 3.5 Definition and Measurement of Variables

**Table 3.1: Description and Measurement of Variables**

Construct	Definition and measurement
<i>Dependent variable</i>	
Firm Revenue	Firms' total annual sales in Kenya shillings, measured in logarithm
<i>Independent variables</i>	
Use of website	1 if firm owns a website; 0 if otherwise
Use of Internet	1 if firm uses internet for daily operations; 0 if otherwise
Use of Mobile Money	1 if firm uses mobile money for financial transactions; 0 if otherwise
<i>Control Constructs</i>	
Age	Age of firm in years
Size	1 if firm is small enterprise, 2 if medium enterprise and 3 if large enterprise
Sector	1 if firm belongs to the manufacturing or retail sector; 0 if otherwise
Region	1 if the company is in Nairobi County; 0 if it is in another County
Manager's experience	Manager's experience in years.

### **3.6 Econometric Issues**

Econometric tests were conducted to determine the best model for research. This included test for fixed or random effects, heteroscedasticity test, autocorrelation test and multicollinearity test.

#### **3.6.1 Test for fixed or random effects**

The null hypothesis in this study indicated that random effects are the preferred model, while the alternative hypothesis indicated that fixed effects are more reasonable, thus the Hausman test was employed to establish whether fixed or random effects are more acceptable. The test shows whether the regressor is correlated with the unique error. Random effect is the recommended model for data analysis when the P value for all study variables is larger than 0.05, while the preferred model for data analysis when the P value is less than 5% is fixed effect.

#### **3.6.2 Diagnostic Tests**

This study used a modified Wald test as a heteroscedasticity test. A p value that is more than the significance level (5%), but less than 5%, indicates the existence of heteroscedasticity. Autocorrelation was assessed using the Breusch-Godfrey serial correlation LM test. If the p value is higher than the significance level (5%), then there is no autocorrelation in the data, and if it is lower than 5%, then there is autocorrelation. The VIF was used to test for multicollinearity. The predictor variables are not connected with one another if the VIF is 1. A value between 1 and 5 denotes a moderate correlation between the independent and dependent variables, while anything more than 5 denotes a significant connection. The outcomes of the diagnostic tests are listed in appendix I.

## CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

### 4.1 Introduction

This chapter presents data analysis and discussion. Discussion and data analysis are presented in this chapter. The study sought to determine how digitization has affected Kenyan corporate revenue growth. Results presented include descriptive summary, Hausman test and Random-effect Regression Model

### 4.2 Descriptive Analysis

This section presents summary statistics: Firm revenue, use of website, use of internet, use of mobile money, region, sector, size, age and manager's experience. Results are captured in Table 1.

**Table 1: Descriptive Statistics**

VARIABLES	Observations	Mean	Standard deviation	Minimum	Maximum
Annual sales (Kenya Shillings)	285	6.317e+08	4.997e+09	170,000	8.000e+10
Ln revenue	285	7.579	0.927	5.230	10.90
Manager's experience	329	19.24	11.87	2	60
Website	336	0.476	0.500	0	1
Internet	336	0.568	0.496	0	1
Mobile money	336	0.610	0.488	0	1
Region	336	0.196	0.398	0	1
Sector	336	0.699	0.459	0	1
Age	336	31	18.93	4	114
Small enterprise	336	0.452	0.498	0	1
Medium enterprise	335	0.331	0.471	0	1
Large enterprise	335	0.215	0.411	0	1

Table 1 indicates that the mean of firm revenue was Ksh. 632,000,000. This denoted that the average firm revenue in terms of sales was Ksh. 632,000,000 over the study period (2013 and 2018). Results also indicated that about 47.6%, 56.8% and 61% of the firms use websites, internet and mobile money respectively. In terms of region, results indicate that 19.6% of most of the firms are located outside Nairobi County. On sector, results reveal that 69.9% of the firms are in manufacturing and retail. In terms of size, 45.2% are small, 33.1% are medium and 21.5% are large sized. When it came to age, the bulk of the companies were roughly 31 years old, with the youngest being 4 years old and the oldest being 114 years. Finally, results revealed that the average managerial experience was 19 years.

### 4.3 Correlation Matrix

Table 2 shows the correlation matrix which represents the relationship of the study variables in the data analysis.

**Table 2: Correlation Matrix**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Manager's experience	1.00										
(2) Website	0.04	1.00									
(3) Internet	0.01	0.01	1.00								
(4) Mobile money	-0.01	0.09	0.15*	1.00							
(5) Region	0.01	0.07	0.05	0.12	1.00						
(6) Sector	-0.11	-0.12*	-0.05	-0.01	0.02	1.00					
(7) Age	0.40***	0.04	-0.11	-0.22***	-0.10	-0.04	1.00				
(8) Small enterprise	-0.16**	-0.38***	0.02	0.04	0.05	0.13*	-0.22***	1.00			
(9) Medium enterprise	0.06	0.08	0.02	-0.02	-0.05	0.05	0.06	-0.64***	1.00		
(10) Large enterprise	0.13*	0.37***	-0.04	-0.03	-0.00	-0.22***	0.19**	-0.47***	-0.37***	1.00	
(11) Annual sales	0.10	0.09	-0.06	-0.10	-0.01	-0.13*	0.21***	-0.10	-0.07	0.20***	1.00
Observations	281										

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Correlations suggested that manufacturing firms tended to be associated with less sales than services sector. Age of the firm was associated with higher sales. Further, size of the firm was such that higher sales were associated with larger firms.

However, the linear associations between sales of the firm and the following variables was not significant: manager's experience, website adoption, internet use, mobile money use, location/region, small firms, and medium firms.

### 4.4 Diagnostic Tests

Results indicated that heteroscedasticity was not a problem (see Table 4). Results also revealed that independent variables were not multicollinear (see Table 5). Further, results indicated that there was no autocorrelation (see Table 6). Additionally, Hausman test led to the adoption of the random effects model in estimating the determinants of firm revenue growth (see Table 7).

### 4.5 Empirical Results

Following the Hausman test, random effect model was preferred over the fixed effect model and the results of the random effect model were reported in Table 3.

**Table 3: Determinants of Firm's Revenue**

VARIABLES	Ln revenue of the firm	
	Fixed effects	Random effects
Manager's experience	0.00889 (0.00721)	0.00351 (0.00422)
Website adoption	0.271* (0.153)	0.340*** (0.101)
Internet use	-0.146 (0.156)	0.132 (0.0920)
Mobilemoney	0.0367 (0.162)	0.153 (0.0966)
Region	–	–
Sector	0.174 (1.113)	0.0230 (0.102)
Age of the firm	0.00345 (0.00436)	0.00718*** (0.00267)
Size of the firm:		
Small enterprise	-1.260*** (0.218)	-1.027*** (0.136)
Medium enterprise	-1.015*** (0.211)	-0.640*** (0.130)
Large enterprise (reference group)	–	–
Region		0.0865 (0.114)
Constant	8.006*** (0.837)	7.591*** (0.198)
Observations	281	281
R-squared	0.396	
Number of id	162	162

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Region was dropped automatically. This suggested that location of the firm did not matter.

In Table 3 the results suggested that if a firm operates another 1% of a year then sales will increase by 0.222%. further the results showed that if a manager works in the industry 1% of a year, then sales will increase by 0.068%.

The results show that a firm that uses website collects 0.340% higher revenues than a firm which does not use website. Further, a firm that uses internet collects 0.132% higher revenues than a firm that does not. Small firm collects 1.027% less revenue than large firm while medium firm collects 0.640 less revenue than a large firm. Firm located in Nairobi collects 0.087% higher revenue than a firm located elsewhere. Firm in the manufacturing sector collects 0.023% higher revenue than the firm which is not in the sector.



However, age of the firm, website use and size of the firm significantly affect the firm's revenue while other variables do not. The results confirmed a study by Olonde (2017) that found social media marketing had a big impact on how much a company makes. The findings also concurred with Kawira et al. (2019) observation that digital marketing considerably raises firms' performance. Similarly, the findings agreed with a study by Wakonyo (2019) who found that using social media networks effectively to sell services and goods for businesses results in higher revenue growth.

## **CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND POLICY RECOMMENDATIONS**

### **5.1 Introduction**

The study's findings, conclusions, and policy suggestions are summarized in this chapter.

### **5.2 Summary of Findings and Conclusions**

The main aim of this paper was to examine the effect of digitalization on firm revenue growth in Kenya. The study used panel secondary data covering for two periods (2013 and 2018). Panel data procedures including Hausman test and random-effect regression model were used.

The paper sought to assess the effect of website usage on the revenue growth of Kenyan companies. The results showed that website usage had a favorable and considerable impact on Kenyan business revenue growth. This demonstrated that using websites considerably boosts the growth of firm income in Kenya.

The purpose of this research is to find out how internet usage in Kenya affects the company's sales growth. The results showed that internet use in Kenya had a favorable but little impact on company revenue growth. This shown that internet use in Kenya only slightly accelerates the development of corporate income.

The study's objective was to ascertain how Kenya's use of mobile money impacted business revenue growth. The results showed that the adoption of mobile money had a favorable but negligible impact on the increase in business revenue in Kenya. This shown that the use of mobile money very slightly accelerates Kenyan business revenue growth.

The goal of the study was to ascertain how age and business size affected Kenyan firm revenue growth. The results showed that in Kenya, firm age and size had a favorable and significant impact on firm revenue growth. This suggested that older businesses are more likely than younger ones to see better revenue growth. The results also showed that large enterprises were more likely than small firms to see higher revenue growth.

The aim of this study is to determine how region, industry and manager's experience affect the revenue growth of companies in Kenya. The results showed that manager's experience, sector, and area all contributed positively but insignificantly to firm revenue growth in Kenya. This

denoted that region, sector and manager's experience have minimal effect on firm revenue growth in Kenya.

Based on the findings, the study concluded that use of websites positively and significantly affects the firm revenue growth in Kenya. The implication is that use of websites would significantly enhance firm revenue growth in Kenya. The study also concluded that firm age and size had a positive and significant effect on firm revenue growth in Kenya. Therefore, older firms experience higher revenue growth compared to younger firms. Further, large firms experience higher revenue growth compared to small firms. The study also found that manager's experience, geography, sector, and use of mobile money have a favorable but statistically negligible impact on the increase of a firm's revenue in Kenya.

### **5.3 Policy Recommendations**

The current study established that use of websites had a positive and substantial effect on firm revenue growth in Kenya. The study recommends that firms without websites should invest in developing company websites that will attract more business thus enhancing revenue growth. Firms with websites should invest in further improvement of the websites to incorporate changes within the firm or from external market. Firms should invest in digital oriented personnel to help in capitalizing on the gains of digitalization. The government of Kenya should review policies on digitalization aimed at making them friendly to firms. The government through relevant ministries should develop programs aimed at training firms on the importance of digitalization.

The study concentrated on how digitalization affected Kenyan corporate revenue growth. Researchers could focus on similar studies but in other East African Countries such as Tanzania, Rwanda, and Uganda for the purpose of comparison.

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## APPENDICES

### Appendix I: Diagnostic Tests

This section presents diagnostic tests results including heteroscedasticity test, multicollinearity test and autocorrelation test. This ensured that spurious regression results were not reported.

#### Heteroscedasticity Test

The heteroscedasticity test was used to see if the error term in the data was connected to the observations. The null hypothesis is that there is no heteroscedasticity in the data. Table 4 shows a probability value of 1.0 > 0.05. This led to acceptance of the null hypothesis that data does not suffer from heteroscedasticity. The results revealed that heteroscedasticity was not a problem.

**Table 4: Heteroscedasticity Test using Modified Wald test**

Modified Wald test for groupwise heteroskedasticity	
H0: $\sigma(i)^2 = \sigma^2$ for all i	
chi2 (162)	1.50E+65
Prob>chi2	1.000

#### Multicollinearity Test

VIF was used to examine multicollinearity. When the VIF value is 1, there is no correlation between the predictor variables. Between the independent and dependent variables, a value between 1 to 5 indicates a moderate link, while anything more than 5 indicates a substantial correlation. Table 5 shows overall VIF of 1.17, which is less than 5. This proves that the independent variables were not multicollinear. Values exceeding 0.1 in the tolerance range also support the results. This demonstrated that the independent variables' correlation was within acceptable bounds.

**Table 5: Multicollinearity test using VIF**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
Size	1.36	0.737014
Age	1.33	0.754094
Use of website	1.26	0.791681
Management experience	1.22	0.817938
Use of mobile money	1.1	0.913233
Sector	1.05	0.949212
Use of internet	1.04	0.964579
Region	1.03	0.971662
Mean VIF	1.17	

**Autocorrelation Test**

The autocorrelation test was based on Breusch-Godfrey Serial Correlation LM Test. Table 6 indicates a probability value of  $0.3343 > 0.05$ . This led to acceptance of the null hypothesis that the data does not suffer from autocorrelation. Therefore, there was no autocorrelation.

**Table 6: Breusch-Godfrey Serial Correlation LM Test**

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.100131	Prob. F(2,270)	0.3343
Obs*R-squared	2.271392	Prob. Chi-Square(2)	0.3212

**Hausman Test**

The selection of a fixed or random effect model was carried out using the Hausman test. If the p-value is higher than 0.05, the null hypothesis (sequence random effects model) is accepted. If the p value is less than 0.05, the null hypothesis is rejected, proving the fixed effects model to be more accurate. Table 7 shows p value of  $0.0589 > 0.05$ . This means that the null hypothesis was accepted (Random Effect Model is appropriate). Therefore, the random effect model was considered to be more consistent and suitable for this study.

**Table 7: Hausman Test**

	(b) Fixed	(B)	(b-B) Difference	Standard error
Manager's experience	.0088916	.003513	.0053786	.0056086
website	.2712367	.3396608	-.0684241	.1097802
Internet	-.1455502	.1319388	-.277489	.1204126
Mobile money	.0366951	.1530031	-.116308	.1239561
Sector	.1739027	.0229508	.1509519	1.077289
Age	.0034508	.0071756	-.0037248	.0032912
Small enterprise	-1.260192	-1.027482	-.2327097	.1622226
Medium enterprise	-1.014794	-.6395067	-.3752868	.1585962

Chi-square=15.01, probability>chi-square=0.0589