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**INFLUENCE OF REGULATORY FRAMEWORK ON THE RELATIONSHIP
BETWEEN FACTORS INFLUENCING CASHLESS TRANSACTIONS AND GROWTH
OF CASHLESS TRANSACTIONS**

KIRUI CHERUIYOT ERNEST

**A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION AT STRATHMORE UNIVERSITY BUSINESS SCHOOL**

**STRATHMORE UNIVERSITY BUSINESS SCHOOL,
NAIROBI, KENYA**

SEPTEMBER 2022

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge and belief, the work contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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Approval

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ABSTRACT

The study sought to examine the influence of the regulatory framework on the growth of cashless transactions in commercial banks in Kenya. The specific objectives were to evaluate the extent of evolution of the digital currency in Kenya, establish factors influencing the growth of cashless transactions of commercial banks in Kenya and examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya. The study was based on three theories, namely the Technology Acceptance Model, Schumpeter's theory of innovation and the theory of diffusion of innovations. The study employed the explanatory research design. The study adopted a positivism approach. The target population included all 41 licensed commercial banks in Kenya. The study included the entire population as the sample size. The researcher picked managers from the 41 commercial banks. Two managers from the human resource department, finance department, marketing department and ICT department were randomly picked. Hence, the number of respondents targeted for the questionnaires were 328. Questionnaires were used to collect primary data. The data was analyzed using descriptive and inferential statistics. The regression results showed that perceived risks, perceived ease of use, financial literacy and financial innovation could explain 69.2% of the variations in the growth of cashless transactions of commercial banks in Kenya. The perceived risks is positively and significantly related to the growth of cashless transactions ($\beta=0.306$, $p=0.000$). It was found that perceived ease of use is positively and significantly related to the growth of cashless transactions ($\beta=0.172$, $p=0.000$). In addition, the study found that financial literacy is positively and significantly related to the growth of cashless transactions ($\beta=0.072$, $p=0.004$). Finally, the study found that financial innovation is positively and significantly related to the growth of cashless transactions ($\beta=0.469$, $p=0.000$). The study found that regulatory framework has a controlling effect on the growth of cashless transactions of commercial banks in Kenya. The study found that the Central Bank of Kenya proposes introducing a digital currency to ease cross-border payments and complement mobile money in the local market. The study recommended that commercial banks in Kenya should increase mass education/enlightenment on finance management so that people can achieve the most from the latest development in the cashless system. The government should develop a regulatory framework with guidelines on how commercial banks should implement internet banking. Another study is recommended in other financial sectors, such as microfinance institutions. Moreover, future researchers could also introduce controlling variables other than regulatory frameworks, such as ownership structure and firm characteristics.

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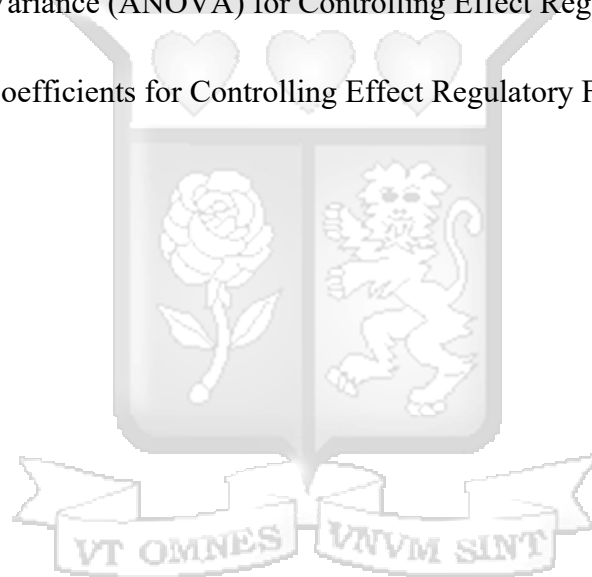
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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
EFT	Electronic Funds Transfer
GDP	Gross Domestic Product
KCB	Kenya Commercial Bank
KSH	Kenya Shillings
LTD	Limited
NACOSTI	National Commission for Science, Technology Innovation
NBK	National Bank of Kenya
PDA	Personal Digital Assistant
PLC	Public Limited Company
RTGS	Real-time Gross Settlement
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
USSD	Unstructured Supplementary Service Data

OPERATIONAL DEFINITION OF TERMS

Cashless transactions: Cashless transactions involve the payment of goods and services using credit cards, debit cards, mobile devices and electronic funds transfer instead of cash or checks (Sarika & Vasantha, 2019). Cashless transactions were determined by the increase of online deposits, an increase in electronic funds transfer and the increase of online withdrawals.

Financial innovation: Financial innovation entails creating new financial products, services, or processes to enhance (Maina & Mungai, 2019). The study used Mobile Apps, Credit/debit cards and Internet banking as financial innovation measures.

Financial literacy: Financial literacy is the possession of the set of skills and knowledge that allows individuals to make informed and effective decisions with all of their financial resources. Financial literacy entailed cash management skills, knowledge in making online transactions and making sound financial choices.

Perceived ease of use: Perceived ease of use is the degree to which a person believes an innovation would be free of effort (Wachira & Kihui, 2017). The study used easy to use technology, easy to do transactions and easy to understand as indicators of the perceived ease of use.

Perceived risks: Perceived risks include the belief of someone toward something's ineffectiveness (Teka, 2020). Perceived risks include factors such as the fear of loss of money through fraud, the spread of contagious diseases and the need to have a reference for future usage.

Regulatory framework: A regulatory framework is a system of regulations and the means to enforce, usually established by the government, to regulate a specific activity (Banegas & Tase, 2020). The regulatory framework in the study was defined by banking policies, internet regulations and financial regulations

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Cashless transaction is inevitable with the tremendous developments in technology (Singhraul & Garwal, 2018). The cashless transaction is considered to continue growing because it eliminates several business risks such as theft of cash and counterfeit money (Adeyemo, Isiavwe, Adetula & Owolabi, 2020). Customers prefer cashless transactions due to its efficiency and flexibility. Cashless transactions involve the payment of goods and services using credit cards, debit cards, mobile devices and electronic funds transfer instead of cash or checks (Sarika & Vasantha, 2019). Covid 19 pandemic outbreak has been deemed critical to foster the growth of the cashless transaction due to the health risks related to the use of cash (Wisniewski, Polasik, Kotkowski & Moro, 2021). The growth of cashless transactions is of great concern not only to banks but to governments, public and other stakeholders due to its critical role (Sarika & Vasantha, 2019).

Globally, Kurian, Zan and Dham (2020) indicate that cashless transaction in commercial banks in Singapore has been on the rise due to the technological change and innovation of the banks and it has affected the performance positively. Further, Taasim and Yusoff (2018) reports that cashless transactions positively affect the performance of commercial banks in Malaysia and have been influenced by innovation, financial literacy and flexibility of its transactions. In addition, Polasik and Piotrowski (2016) established the growth of cashless transactions among commercial banks in Poland has enabled people to do the transactions with ease and it has enhanced the growth of banks. The study noted that cashless transactions make transactions more accessible and is influenced by financial innovations and financial literacy. Further, Ishak (2020) reported the

efficiency of the cashless system such as low risks, fast transactions, reduction of errors and time used in conducting the transactions being less have led to the growth of more cashless transactions in Malaysia.

Regionally, Daniyan-Bagudu, Khan and Roslan (2017) reported that the growth of cashless transactions among commercial banks in Nigeria increased due to the people's financial literacy, financial innovations and development of mobile applications. The cashless transactions have affected the performance of the banks positively. Moreover, it was reported by Mukamunana (2019) that cashless transaction is increasing in Rwanda because of mobile banking. Besides, Shaaban (2020) stated that financial literacy increases the cashless transactions in NMB Bank in Tanzania and it affects its performance positively. Moreover, Awuku (2019) noted that cashless transactions in commercial banks in Ghana have grown due to financial innovation and financial literacy.

In Kenya, Maina and Mungai (2019) indicated that most commercial banks have adopted cashless transactions due to technological advancements and high innovation and it has increased the performance. Moreover, Waiganjo (2018) unveiled the growth of cashless transactions among commercial banks had been influenced by internet banking, mobile banking, ease of conducting transactions, financial literacy in making online transactions and safety associated with digital transactions such as privacy. The Central Bank of Kenya (2017) report shows that cashless payments grew by 19 percent to Shillings 2.31 trillion, nearly equaling the Shillings 2.37 trillion handled in 2014.

1.1.1 Growth of Cashless Transactions

The growth of cashless transactions is inevitable and is anticipated to continue expanding due to globalization and technological advancement (Sarika & Vasantha, 2019). The cashless system

benefits businesses in which they can increase sales and grow business by providing convenient, safe and faster services to customers in administering transactions (Sreenu, 2020). Some of the factors influencing the growth of cashless transactions globally, regionally and locally include perceived risks, perceived ease of use, financial literacy and financial innovation (Kurian, Zan & Dham, 2020; Taasim & Yusoff, 2018; Polasik and Piotrowski, 2016; Daniyan-Bagudu, Khan & Roslan, 2017; Mukamunana, 2019; Awuku, 2019; Maina & Mungai, 2019; Waiganjo (2018)

Perceived risks include the consumer's level of uncertainty regarding the outcome of a transaction decision. The perceived risks of using cash, such as fear of losing money through fraud and the spread of contagious diseases, could stimulate an individual to settle on using cashless transactions (Baganzi & Lau, 2017; Liébana-Cabanillas Leiva & Fernández, 2017; Ecurity, Haracteristics & Ender, 2017). The perceived ease of use is the degree to which a person believes an innovation would be effortless (Maina, 2020). The financial literacy that includes cash management skills and knowledge in online transactions is one of the factors that transpire to transformation to cashless transactions (Szopiński, 2016; Maina & Mungai, 2019). Financial innovative products are vital forces for the diversification of banks, thus generating high revenue and minimizing the cost (Jumba & Wepukhulu, 2019).

The main types of cashless transactions in India, according to Pal, Chandra, Kameswaran, Parameshwar, Joshi, and Johri (2018), include banking cards, mobile banking, national electronic funds transfer, automatic teller machines and mobile applications. Moreover, in Pakistan, cashless transactions include mobile banking, credit cards, debit cards and mobile application (Zafar, Riaz & Mahmood, 2021). In Malaysia, the types of cashless transactions include mobile wallet applications, Unstructured Supplementary Service Data (USSD), Electronic clearance service and mobile banking (Sapian & Ismail, 2021). The types of cashless transactions in Indonesia include

mobile applications, automatic teller machines, mobile banking and banking cards (Helfasari, Gamayuni & Syaipudin, 2021).

In Africa, the main types of cashless transactions include debit and credit cards, internet banking, mobile banking and automatic teller machines (Mukamunana, 2019; Shaaban, 2020; Daniyan-Bagudu, Khan & Roslan, 2017; Awuku, 2019). Further, in Kenya, Muthoni (2018), Gichaba and Oluoch (2019) and Waiganjo (2018) indicated that types of cashless transactions include mobile applications, automatic teller machines, mobile banking, debit and credit cards. The summary showing different forms of cashless transactions and their growth in commercial banks in Kenya over time is presented in Table 1.1. The summary notably includes mobile money transactions, debit/credit cards transactions, cheques transactions and electronic funds transfers.

Table 1.1: Cashless transactions and growth

Cashless transactions	Growth			
	2017	2018	2019	2020
Mobile Money Transactions (Ksh. billion) per year	332.6	367.8	382.9	605.7
Debit/Credit Cards Transactions (Ksh. billion) per year	2,825.1	2,833.5	2,459.0	2,412.2
Cheques Transactions (Ksh. billion) per year	174.3	228.1	301.9	209.6
Electronic funds transfer (Ksh. billion) per year	26.7	31.6	78.2	101.3

Source: Central Bank of Kenya (2020)

However, cashless transactions have been faced with some challenges. It was indicated by Hasan and Amaan (2017) that challenges of the cashless transactions in India include non-familiarity and lack of required technological skills by consumers, extra charges and security concerns such as hacking and fraud through the use of fake ATM cards. In Malaysia, the challenges of cashless transactions in banks include hacking of the system, illiteracy of the customers and low internet

penetration (Alam, Awawdeh & Muhamad, 2021). In the Philippines, the challenges of cashless transactions include customer illiteracy, high cash dependency, higher risk of identity theft and lack of digital infrastructure in the rural areas (Nair, 2016). Moreover, Awuku (2019) found that cyber-attacks, high illiteracy rate, identity theft, unreliable networks, and extra transaction charges are significant challenges to Ghana's cashless transactions.

In Zimbabwe, Nyoni (2018) found that challenges of cashless transactions are overspending of money, unreliable networks, transaction costs, internet difficulties, hacking, fraud and changes in the transactions. In Kenya, the challenges of the cashless transaction include hacking of the system, fraud, internet challenges, high cash dependency, financial illiteracy, inadequate access to smartphones and (Maina & Mungai, 2019; Kariu, 2017; Mwangi, Omwono, Tuggar, Mbuthia, Kinyua & Omenge, 2018; Waiganjo, 2018; Murimi & Muchelule, 2018).

1.1.2 Commercial Banks in Kenya

There are 41 commercial banks in Kenya, as shown in appendix III. The market share of the financial institutions in the country is dominated by nine banks with a market share of 70.28%, while medium banks have a market share of 21.2% and small banks have a market share of 8.5% (CBK, 2019). The banking sub-sector assets comprised about 49.51% of nominal GDP in 2018, a decline over the last six years from a high of 59.3% in 2014. The major players among the 41 commercial banks include Absa Bank, Standard Chartered Bank, Cooperative Bank, Equity and Kenya Commercial Bank.

Absa Bank and Standard Chartered Bank are Multinationals, while others are locals. Commercial Banks Institutions are licensed and regulated under the Companies Act, Banking Act, Central bank of Kenya regulations and prudential guidelines issued by CBK regularly (Mwangi, Omwono, Tuggar, Mbuthia, Kinyua & Omenge, 2018). The performance of the commercial banks in Kenya

has not been optimal. Due to financial capacity challenges, some banks have exited the market, such as Dubai Bank, Imperial Bank and Chase Bank. In addition, the difficulties in financial capacity have led to mergers and acquisitions of the banks (CBK, 2016). For instance, Kenya Commercial Bank (KCB) acquired the National Bank of Kenya (NBK), Commercial International Bank acquired Mayfair Bank Limited, Access Bank PLC acquired Transnational Bank PLC and Merger of NIC Group PLC and Commercial Bank of Africa Limited (CBK, 2019, 2020).

The profitability growth among the commercial banks in Kenya has been declining since 2019. In 2018, the banking sector reported a 14.6 percent growth in profitability, but in 2019, profitability growth declined by 10.4 percent to 4.2 percent and in 2020, the growth in profitability declined by 29.5 percent (CBK, 2018, 2019, 2020). The decline in growth in profitability may drive some of the firms in the banking sector unsustainable, thus exiting the market. Cashless transactions are contemplated to be one of the critical factors that increase the organizations' revenue (Kurian, Zan & Dham, 2020; Taasim & Yusoff, 2018; Shaaban, 2020; Waiganjo, 2018). Based on this background, the study sought to examine the factors influencing the growth of cashless transactions in commercial banks in Kenya.

1.2 Statement of the Problem

Cashless transactions have been faced with difficulties not only in Kenya but globally. It was indicated by Hasan and Amaan (2017) that challenges of cashless transactions in India include non-familiarity and lack of required technological skills by consumers, extra charges and security concerns such as hacking and fraud through the use of fake ATM cards. In the Philippines, the challenges of cashless transactions include customer illiteracy, high cash dependency, higher risk of identity theft and lack of digital infrastructure in the rural areas (Nair, 2016).

Moreover, Awuku (2019) found that cyber-attacks, high illiteracy rate, identity theft, unreliable networks, and extra transaction charges are significant challenges to Ghana's cashless transactions. In Kenya, the challenges of the cashless transaction include hacking of the system, fraud, internet challenges, high cash dependency, financial illiteracy, inadequate access to smartphones and (Maina & Mungai, 2019; Kariu, 2017; Mwangi, Omwono, Tuggar, Mbuthia, Kinyua & Omenge, 2018; Waiganjo, 2018; Murimi & Muchelule, 2018). Due to inconsistent findings, specific factors influencing the growth of cashless transactions in commercial banks in Kenya are currently unknown.

Some studies (Teka, 2020; Baganzi & Lau, 2017; Baariu, 2015; Githii & Mwangi, 2018; Maina & Mungai, 2019; Kipng'etich, Chepkilot, & Koima, 2018; Daniyan-Bagudu, Khan & Roslan, 2017) found factors that influence the growth of cashless transactions include perceived risks, mobile banking services, agency banking and strategic factors. On the contrary, Kamau and Oluoch (2016), Muchiri (2017), Szopiński (2016), Mushkudiani (2018), Taghiyev, Eminov and Guliyev (2016), Munywoki (2016) and Mwangi, Kuria and Atheru (2018) demonstrated that the growth of cashless transaction is determined by financial innovation, strategic alternative banking channels, online banking and technology advancement. Thus, a knowledge gap existed that needed to be ascertained, thus the rationale for conducting the current study.

1.3 Research Objectives

The section included the general objective and specific objectives.

1.3.1 General objective

The general objective of this study was to determine the influence of regulatory framework on the relationship between factors influencing cashless transactions and growth of cashless transactions

1.3.2 Specific Objectives

- i. To evaluate the extent of evolution of the digital currency in Kenya
- ii. To establish factors influencing growth of cashless transactions of commercial banks in Kenya
- iii. To examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya

1.4 Research Questions

The research questions that guided the study included;

- i. To what extent is the evolution of the digital currency in Kenya?
- ii. What are the factors influencing growth of cashless transactions of commercial banks in Kenya?
- iii. To what extent does regulatory framework control the growth of cashless transactions of commercial banks in Kenya?

1.5 Scope of the study

The objective scope of the study was to examine the influence of regulatory framework on the relationship between factors influencing cashless transactions and growth of cashless transactions.

The specific objectives were to evaluate the extent of evolution of the digital currency in Kenya, establish factors influencing the growth of cashless transactions of commercial banks in Kenya and examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya. The study included commercial banks in Kenya operated between 2018 and 2021. The justification for choosing the period between 2018 and 2021 was to get the current information on the cashless transactions of commercial banks in Kenya. The period

facilitated getting the precise details regarding the cashless transactions and this could foster reliable policy formulations.

1.6 Significance of the study

The study is expected to be significant to the managers of commercial banks, Kenyan government/ policymakers and academicians/ researchers.

1.6.1 Managers of Commercial Banks

The significance of the study is that managers of commercial banks are expected to get information on the factors influencing the growth of cashless transactions. The management within the commercial banks in Kenya will be in a position to determine whether the growth of cashless transactions is critical in influencing the performance. In addition, the management of the banks can make policies regarding cashless transactions based on the recommendations presented in the study.

1.6.2 Kenyan government/ Policy Makers

Moreover, the study is expected to be very important to the Kenyan government. The study to provide information that can be used by policymakers in the government to design and implement policies that contribute to the growth of cashless transactions of commercial banks in Kenya. The policies deemed to regulate the commercial banks in Kenya to strengthen the performance may be based on the study's recommendations. Based on the study's findings, commercial banks in Kenya to comprehend and appreciate the benefits of cashless transactions.

1.6.3 Academicians and Researchers

The findings of the study are also expected to be very helpful to future academicians and researchers. The study to act as a basis for future studies, notably those looking at the factors

influencing the growth of cashless transactions. In general, the study is expected to provide comprehensive knowledge to the literature on the factors influencing the growth of cashless transactions and its influence on performance. The recommendations of the study may act as the foundation for future related studies.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter discusses the theoretical review, empirical review, knowledge gaps, conceptual framework and operationalization of the variables. The sections are exhaustively examined.

2.2 Theoretical Review

The theoretical review describes the theory that explains why the research problem under study exists. The theoretical framework is the structure that can hold or support a theory of a research study. A theory is a pool of knowledge that strives to explain a particular phenomenon. A theory provides a framework for explaining observations and the explanations are based on assumptions. The theories that informed the study were Technology Acceptance Model, Schumpeter's theory of innovations and the theory of diffusion of innovations. These theories were factored to be relevant based on the purpose of the study.

2.2.1 Technology Acceptance Model

The proponent of the Technology Acceptance Model (TAM) was Fred Davis in 1989. The model shows that companies should adopt modern technology to cope with the changing environment. However, the acceptability of the technology is determined by two main factors: perceived usefulness and perceived ease of use (Lee, Kozar, & Larsen, 2003). Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his or her performance. On the other hand, the perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless (Davis, 1989).

Technology Acceptance Model postulates that the behavioral intention of an individual determines the recognition of the technology in an organization. According to Davis, the attitude of an individual is not the only factor that determines the use of a system but is also based on the impact that it may have on the performance (Hu, Chau, Sheng & Tam, 1999). Therefore, even if a person does not welcome the introduced technology, the probability that he or she will use it is high if he or she perceives that the system will improve the performance or efficiency.

However, the model faces some weaknesses. For instance, the model sidelined to consider other factors that affect the acceptance and the willingness to use technology, such as education and age (Bagozzi, 2007). Furthermore, the model failed to examine the influence of the attitude, norms and culture of the employees in the process of adoption of the new technology in which the management decides the technology to be adopted in the company without considering how the employees will react to the move despite the technology expected to improve the efficiency in production (Wallace & Sheetz, 2014).

Nonetheless, the model is relevant to the current study since moving to cashless transaction is the acceptance of new technology and advanced ideas in the system. The model reveals that technology is significant and eases the process of production in the system. Adopting the superior method of production, the organization will lower the costs of production significantly and thus increase the performance and gain a competitive advantage. The models report that the successful implementation of the technology depends on the user's perceived usefulness, which is a function of ease of use and perceived quality. Hence, technology acceptance model informed the variable of perceived risks and perceived ease of use in the current study.

2.2.2 Schumpeter Theory of Innovations

The proponent of the Schumpeter Theory of Innovations was Joseph Schumpeter in 1982. The theory illustrates the importance of knowledge, skills and innovation in an organization is to generate revenue (Dabic, Cvijanovic & González 2011). The theory admits that in some situations, small companies are in an upper hand to innovate over the larger companies since the small companies are very flexible and do not have bureaucratic structures that are necessary to the larger institutions (Drejer, 2004). The organization that adopts modern technology and promotes a conducive environment that enables its employees to be innovative has higher performance. The ability of the organization to innovate and come with new methods of production is determined by the size of the organization and the market share. Moreover, the theory argues that innovative countries are more successful than those countries that wait for others to develop new methods of production and service delivery for them to imitate. Moreover, the theory asserts that the motive behind any of the innovations is to expand the level of the profits by minimizing the cost as possible (Schumpeter, 1982).

The approach illustrates that the reduction of the production cost stimulates innovation and enhancement of the services offered, thus increases customer attraction and retention. Changes are enhanced by entrepreneurs who are independent and are willing to take risks as an act of will. Schumpeter (1982) puts it that innovations are always happening in the industry and for this reason, institutions need to be aware of them. The theory argues that even before other firms accept changes, other innovations usually emerge, leading to a new cycle again (Hospers, 2005). It is for this reason that there are a variety of innovations within the organization to boost their financial performance.

Nonetheless, the theory expresses some weaknesses. For instance, the theory failed to concentrate on the complex issues such as the cultural and political factors and the societies which are believed to be rational in the process of deciding on whether to adopt a new technology or not (Ruef, 2002). Thus, the Schumpeter theory of innovations has concentrated more on the innovation itself rather than the social-cultural factors associated with the technology and the consequences related to the introduction of the change in the industry. The technological innovations become successful when they appreciate and provide a beneficial role to the consumers and all the stakeholders but the theory failed to examine the role of those customers and stakeholders (Tichy, 1994).

However, the theory has strengths that make it relevant to the current study despite the critics. Innovation is required in establishing new opportunities and increase profits. As discussed by Schumpeter (1934), innovations are enhanced by entrepreneurs who are independent and are willing to take risks as an act of will. The ability of the organization to innovate and come with new methods of production is determined by the size of the organization and the market share. The significance of the theory is that it establishes that organizations should utilize modern technology and support a favorable environment that will enable their employees to be innovative. Thus, the theory informed financial literacy in the study. Financial literacy is the possession of skills and knowledge that allows an individual to make informed and productive decisions based on the market's changes.

2.2.3 Theory of Diffusion of Innovations

The proponent of the theory of diffusion of innovations was Everett Rogers in 1995. The theory explains the diffusion of innovations as the process by which a change is communicated through specific channels over time among the members of social systems (Aizstrauta, Ginters & Eroles, 2015). A decision not to adopt an innovation relates to the rejection of the available new idea. A

company with high innovation practices enjoys a higher performance compared with those institutions that majorly rely on other companies to innovate for them to copy.

The theory goes further to illustrate that innovation is the creation and transformation of new knowledge into new products, processes, or services that meet market needs (Wejnert, 2002). When the innovations are high, it enables the organization to create a new business outlook and becomes a vital source of the expansion and growth of the business, thus higher profitability. Innovation is indispensable for an organization and can be used to outsmart the competitors and gain a competitive advantage. The theory assumes that innovations are inclusive of relative advantage, complexity, compatibility, observability and reliability (Rogers, 1995).

The relative advantage, according to the theory, is the degree to which an innovation is perceived as better than the idea it supersedes. A compelling comparative advantage will occur when the new systems been introduced is believed to bring more benefits than the existing ones (Rogers, 1995). Likewise, the theory establishes that before an innovation is added to the organization, the management and all the stakeholders are supposed to assess it and examine how difficult the innovation is to be understood and used by parties involved (complexity) (Rogers, 2003). Rodgers went on to illustrate that before the innovation is applied to the organization, it needs to be tested before fully committing to adopt it (reliability).

Nonetheless, the theory had some weaknesses. The theory concentrated more on the importance of innovation in an organization but failed to establish mechanisms that can be used to reward those who come up with the new idea in the organization (Matthews, 2017). Also, the theory was unable to examine the cost that is needed to develop a new product or concept before it becomes useful in the organization (Siddiqui & Adams, 2013). Moreover, another weakness of the theory is that the approach did not establish the mechanism to deal with those employees who may resist

the adoption of the new product or service because they were not consulted and therefore, may decide to share the information or idea with the competitors (Lyytinen & Damsgaard, 2001). The innovations become successful when they appreciate and provide a beneficial role to the consumers and all the stakeholders.

Nonetheless, the theory is relevant to the current study. The theory assumes that any innovation that is intended to be introduced in the organization should provide a tangible result that can be seen (observability). Moreover, compatibility refers to how innovation meets the most significant success when users can seamlessly adopt them and replace an existing product for the better (Thomas & Rogers, 1998). The theory is relevant to the current study. The theory shows that innovation is significant to an organization and can be used to outsmart competitors and gain a competitive advantage. The theory also indicates that before implementing any change in an organization, it needs to be tested and make sure it will be successful in the long run. Therefore, the diffusion of innovations theory informed financial innovation in the current study.

2.3 Empirical Review

The empirical review is discussed in sections based on the study objectives. The purpose of the empirical review is to provide an overview of sources used by the researcher while researching a specific topic. It shows readers how the research fits into a larger field of study. The review seeks to identify research gaps that form the foundation of the current study. The review provides a description, summary and critical evaluation of the previous findings concerning the research problem. The section of the empirical review will include the evolution of digital currency, factors influencing the growth of cashless transactions, regulatory framework and growth of cashless transactions, knowledge gaps, conceptual framework and operationalization of variables. Each of the sections will be comprehensively examined.

2.3.1 Evolution of Digital Currency

Digital currency is any currency, money, or money-like asset primarily managed, stored or exchanged on digital computer systems, especially over the internet (Helfasari, Gamayuni & Syaipudin, 2021). Types of digital currencies include cryptocurrency, virtual currency and central bank digital currency. Digital currencies exhibit properties similar to traditional currencies but generally do not have a physical form, unlike currencies with printed banknotes or minted coins. This lack of physical form allows nearly instantaneous transactions over the internet and removes the cost of distributing notes and coins (Zafar, Riaz & Mahmood, 2021). Usually not issued by a governmental body, virtual currencies are not considered legal tender and they enable ownership transfer across governmental borders.

A study was conducted by Choto (2018) on virtual currency as a medium of exchange in Kenya. The study adopted an exploratory approach with mixed-method research whereby both qualitative and quantitative data collection techniques were used. The study focused on virtual currency users as the target population with a sample size of 46 virtual currency users. The findings on technological factors focused on hardware usage, threats in networks, internet usage, and online payment methods. The study found that technology, financial trends and legal frameworks had a significant impact on the adoption of virtual currency in organizations in Kenya. The regression analysis showed that technology has a strong significant positive correlation to the use of virtual currency, financial trends also showed a strong significant positive correlation and use of virtual currency, and a controlled significant positive relationship between legal frameworks and the use of virtual currency.

Further, it is reported by Helfasari, Gamayuni, and Syaipudin (2021) that the growth of cashless transactions in Indonesia includes the utilization of mobile applications, automatic teller machines,

mobile banking and banking cards. According to Pal, Chandra, Kameswaran, Parameshwar, Joshi, and Johri (2018), the main types of cashless transactions in India include banking cards, mobile banking, national electronic funds transfer, automatic teller machines and mobile applications. Moreover, in Pakistan, cashless transactions include mobile banking, credit cards, debit cards and mobile application (Zafar, Riaz & Mahmood, 2021). In Africa, the main types of cashless transactions include debit and credit cards, internet banking, mobile banking and automatic teller machines (Mukamunana, 2019).

Akintaro (2019) asserts that mobile money in Kenya is helping low-income communities make financial transactions across long-distance with their mobile phones, reducing their travel cost and eliminating the risks of carrying cash, and avoiding most high bank charges. Consumers can make payments over the internet, payments at the vending machine, point of sale (POS) using mobile phone devices, personal digital assistant (PDA), smart cards and other electronic payment systems, including debit and credit cards (Kariu, 2017). Muthoni (2018), Gichaba and Oluoch (2019) and Waiganjo (2018) indicated that types of cashless transactions include mobile applications, automatic teller machines, mobile banking, debit and credit cards

Moreover, the growth of cashless transactions is highly attributed to the outbreak of the Covid 19 pandemic. A study conducted by Wisniewski, Polasik, Kotkowski and Moro (2021) showed that people are highly switching from cash to cashless payments during the covid-19 pandemic and beyond. Moreover, another study conducted by Kotkowski and Polasik (2021) showed that the Covid-19 pandemic accelerated payment digitalization. The risks associated with using cash amid the Covid 19 pandemic are stimulating the high adoption of cashless transactions (Nachega, Leisegang, Kallay, Mills, Zumla & Lester, 2020). Thus, the Covid 19 pandemic is also accelerating the growth of cashless transactions.

Mwangi (2014) conducted a study on the adoption of bitcoin in Kenya with the case study of bitpesa. The study noted that bitcoin first appeared in January 2009, the creation of a computer programmer using the pseudonym Satoshi Nakamoto who invented an open-source, peer-to-peer digital currency. The Bitcoin system is private but with no traditional financial institutions involved in transactions. Unlike earlier digital currencies that had some central controlling person or entity, the Bitcoin network is completely decentralized, with all parts of transactions performed by the system's users. With a Bitcoin transaction, there is no third-party intermediary. The buyer and seller interact directly but their identities are encrypted and no personal information is transferred from one to the other. However, unlike a fully anonymous transaction, a transaction record is stored in a global Bitcoin general ledger that is used to validate transactions. For this reason, Bitcoin transactions are thought to be pseudonymous, not anonymous. Although the scale of Bitcoin use has increased substantially, it remains small compared to traditional electronic payments systems such as credit cards and the use of dollars as a circulating currency. This research found that Bitcoin is unregulated in Kenya, with no regulation within the CBK Act outlining how it should be handled. Secondly, the research found that the use of Bitcoin reduced the cost of international funds transfers and that users have challenges adopting the Bitcoin technology in understanding it and how it works.

2.3.2 Cashless Transactions

Cashless Transactions involve the high use of credit cards, debit cards, mobile devices and electronic funds transfers instead of hard cash or checks (Cherotich, Sang, Mutungú & Shisia (2015). Cashless transactions attract transaction fees; debit and credit card application charges and electronic transfers also attract charges depending on whether it's a local or foreign transfer (Liébana-Cabanillas, Leiva & Fernández, 2017). The wide-ranging economic developments of the

previous decade, such as the integration of world economies, have significantly impacted the mobility of the working population and their families (Baariu, 2015). At the same time, technological developments, especially in the field of telecommunication, have made it possible to offer innovative, location-sensitive services on a ubiquitous basis to customers on the move (Teka,2020).

There are numerous forms of the cashless payment within the banks which include mobile money transactions, credit and debit cards, internet banking, real-time payments, and mobile wallets, among others (Rono, 2014; Makanyeza, 2017; Mwangi, Omwono, Tuggar, Mbuthia, Kinyua & Omenge, 2018). Mobile banking has the potential to be transformational owing to various facts. First, it uses the existing mobile communications infrastructure, which reaches unbanked persons. Secondly, it may be driven by new players, such as mobile phone industry operators, with different target markets from traditional banks who can harness the power of new distribution networks for cash transactions (Liu & Tai (2016)

Akintaro (2012) asserts that mobile money in Kenya is helping low-income communities make financial transactions across long-distance with their mobile phones, reducing travel costs, eliminating the risks of carrying cash, and avoiding most high bank charges. Consumers can make payments over the internet, payments at the vending machine, point of sale (POS) using mobile phone devices, personal digital assistant (PDA), smart cards and other electronic payment systems, including debit and credit cards (Kariu, 2017). More advanced smart payment systems are in operation in advanced countries, including in Hong Kong, a contactless and rechargeable smart card allows consumers to pay their bus and train fares, buy snacks at vending machines and cafes, pay parking fees and also pay for access to sports facilities (Mbevi, 2015; Kojo & Yazidu, 2015; Maina & Mungai, 2019). Real-time Gross Settlement (RTGS) enables the movement of funds from

one banking institution to another in real-time; transactions happen instantly and are not subject to time.

2.3.2.1 Factors Influencing Growth of Cashless Transactions

2.3.2.1.1 Perceived Risks

Baganzi and Lau (2017) conducted a study in Uganda to examine the influence of perceived risks on the adoption and use of mobile money payment systems. The survey was conducted with 438 mobile money users and data was analyzed using Partial Least Squares (PLS) and Structural Equation Modelling (SEM). The study results found that the perceived risks such as the loss of money through fraud influenced the adoption and intent towards the use of mobile money payment systems. The study further found that mobile money users rely on the structural soundness of mobile money services providers and their ability to provide mobile money services with low perceived risk. Performance expectancy, perceived risk and structural assurance significantly influenced behavioral intention to adopt mobile money. The study concluded that the perceived risk is significantly and positively related to the adoption and intent towards using mobile money payment systems in Uganda. Kipng'etich, Chepkilot, and Koima (2018) reported that one of the factors that influences the growth of the cashless transactions include technology and strategies adopted.

Liébana-Cabanillas, Leiva and Fernández (2017) conducted a study to examine factors that determine the adoption of mobile payment systems in Spain. The study was conducted among the commercial banks in Madrid. Questionnaires were used to collect the data. The findings of the study revealed that the perceived risks are one of the factors that determine the adoption of mobile payment systems. The study also noted that some of the people in the country are reluctant in the adoption of the mobile payment systems because of the security reasons. According to Xu (2017),

the willingness of users to adopt a mobile payment application is determined by the perceived risk. Factors that are associated with perceived risk include privacy, time, and functional, financial, psychological, physical, trust, social risk and future references for transactions made. Okeke (2013) conducted a study to examine how perceived risk/security influences consumer involvement with electronic payments in Nigeria. The results showed that time-loss risk and security are the most dominant types of risks that influence consumer involvement with electronic payments in Nigeria.

Teka (2020) sought to identify factors that affect customers' usage of electronic banking services within the banks in Ethiopia. The research applied an explanatory research design. A research model was developed by integrating the constructs of the Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB). A total of 420 actual users of e-banking services were used as a sample. A well-structured questionnaire was used to collect the relevant information. The data was analyzed using Structural Equation Modeling. The findings of the study revealed that perceived usefulness, perceived ease of use, attitude towards e-banking, perceived behavioral control, subjective norms, behavioral intention, awareness as well as the availability of internet/network connection have a significant positive impact on users e-banking usage practice. The study further noted that perceived risk has a significant negative impact. The study recommended that banks in Ethiopia should create awareness to their customers with regard to the usage and benefits of e-banking service delivery channels.

Ecurity, Haracteristics and Ender (2017), in their research on the adoption of mobile-based money transfer technology in Ghana, noted that perceived risk is a significant determinant of the behavioural intention of using mobile money payment services by the Ghanaians. Other determinants were perceived usefulness, perceived ease of use and perceived trust. The study

concluded that as part of financial services, mobile money payment /transfer adoption has become dependent on how a user perceives its trust and risk. This, therefore, means that the traditional perception of trust and risk on the usage of financial services still stands. The researcher proposed that a consumer should try the service before adopting it rather than just having a perception of it. Baariu (2015) studied factors influencing subscriber adoption of mobile payments services in Embu town and he noted that with M-Pesa payment services, business owners were able to accept payment for both goods and services from their customers. 19 On the other hand, customers handled less cash and, therefore, less perceived risk associated with handling cash, such as fake currency and theft chances. The study recommended that organizations using mobile money payments services to develop a more robust system that will minimize the perceived risk of losing money. For example, provision of a method of confirming the identity of the business one has registered on the system, being able to bridge the gap that may exist between various organizations and mobile money service providers, especially those providing pay bill services where there is the involvement of other stakeholders and prompt cancellation of wrong transactions

2.3.2.1.2 Perceived Ease of Use

A study conducted by Makanyeza (2017) investigating what determines consumers adoption of mobile money services in Zimbabwe noted that perceived usefulness, perceived self-efficacy, influence from social groups, relative advantages and perceived compatibility had positive effects on the adoption of mobile money payment services. Achieng and Ingari (2015) sought to assess factors affecting the adoption of mobile banking at the KCB Kilindini Branch, Mombasa, Kenya. The study adopted a descriptive research design. A sample size of 169 respondents was used in the study. Data from the target population was collected from account holders in KCB, Kilindini Branch. The study found that perceived risk is one of the key factors impeding the adoption of

mobile banking. The study concluded that perceived ease of use of mobile banking affects mobile banking adoption. The study recommended commercial banks in Kenya need to establish more strategies that will increase the adoption of mobile banking.

Amer, Ibrahim, Othman and Md Jani (2020) sought to investigate the factors that influence the adoption of a cashless payment system among SMEs in the services sector. Thorough literature was reviewed to identify the factors and based on it a model that influences the adoption of a cashless payment system among Malaysian SMEs was constructed. A sample of 105 SMEs in Melaka was used in this research. A structured questionnaire that employed a 7-point Likert scale was used for data collection. Both descriptive and inferential statistics were used in analyzing the data. The research results indicated that the perceived ease of use, perceived usefulness and perceived risk were significant factors in the adoption of the cashless payment system among the SMEs in the services sector. Results of the study further showed that perceived ease of use was the salient factor of SMEs applying the cashless payment system. The study suggested that a cashless payment system is central in sustaining SMEs and the Malaysian SMEs and need to be seriously encouraged to adopt the cashless payment system.

Liu and Tai (2016) conducted a study on the factors affecting the intention to use mobile payment service plans in Vietnam. This study analyzes the impact of various variables extracted from mobility, convenience, compatibility, M-payment knowledge, ease to use, usefulness, risk, trust, and safe to use on the intention to use mobile payment. A quantitative questionnaire was used to measure the responses of participants. The study results indicated that the strong predictors of the intention to use M-payment are perceived ease of use and perceived usefulness. All respondents show that they do not care about risk when they have the intention to use mobile payment services. The convenience of mobility, compatibility, and mobile payment knowledge impacts ease to use

and usefulness. A study by Gumbo, Halimani and Diza (2017) noted that perceived usefulness (PU) and perceived ease of use (PEOU) are arguably the cornerstones if mobile banking is to be successfully implemented and adopted in the financial sector in Zimbabwe.

Rono (2014) sought to determine the relationship between perceived ease of use, perceived usefulness, behavioral intention to use and acceptance of mobile banking services. A descriptive design was adopted to study and analyze the variables. A cross-sectional and correlation quantitative analysis was also adopted to evaluate the acceptance of mobile money. The study population consisted 43 Commercial Banks in Kenya. The study sampled 12 commercial banks. The study used a purposive sampling technique to sample 10 users of mobile banking services from each of the 12 Commercial Banks. Data was collected using both primary and secondary methods. Data was analyzed through descriptive and inferential statistics. The results revealed that perceived ease of use, perceived usefulness and behavioral intention to use are positively related to acceptance of mobile money services. The study further found that the more people will perceive the mobile money system as easy to use, the more their intention and willingness to use the system will increase. The results indicate that perceived usefulness highly influences the behavioral intention to use mobile money services that is, if people perceive technology as useful, their behavioral intention to use increases. The study recommended that system designers and developers should endeavor to achieve user-friendliness in a technological system to increase the end users' perceived ease of use of the system.

2.3.2.1.3 Financial Literacy

Uzonwanne and Ezenekwe (2017) conducted a study to examine how financial literacy affects the cashless system in Nigeria. The study employed a descriptive research design. Questionnaires were administered to 400 participants. Descriptive statistics were used in analyzing the data. The Chi-

square and the F-distribution done with the stipulations of ANOVA and SPSS showed that the impact of financial illiteracy on the cashless policy system is significant on the Nigerian economy. Hence, the study recommended that CBN increases mass education/enlightenment on finance management so that people can achieve the most from the latest development in the cashless system.

Mwangi, Omwono, Tuggar, Mbuthia, Kinyua and Omenge (2018) conducted a study to examine the effect of financial literacy on the performance of microfinance banks in Nairobi County. The study used a descriptive research method. Besides, a self-administered semi-structured questionnaire was used as a data collection tool. The study established that literacy in institution innovation and product innovation were significant factors that influenced the performance positively. The study concluded that innovations are a source of competitive advantage if a firm understands competitors' actions, customer needs, and technological development and act accordingly to stay at par with rivals. The study presents a contextual gap since the study focused to microfinance banks.

Kariu (2017) analyzed the effect of financial literacy on the financial efficiency of commercial banks in Kenya. The specific objectives were to examine the effect of literacy in mobile banking, agency banking on financial efficiency. The study adopted a descriptive research design. The targeted population was 43 banks and a census was conducted. The findings revealed that literacy in mobile banking, internet connectivity and agency banking is positively related to financial efficiency. A study by Daniyan-Bagudu, Khan and Roslan (2017) indicated that perceive risks, agency banking and mobile banking services as fundamental in determining the growth of the cashless transactions. Further, Mushkudiani (2018) found some factors that determine the growth

of cashless transactions include financial innovation, strategic alternative banking channels and advances in the technology applied.

Mbevi (2015) examined the effect of innovation strategies on the financial performance of commercial banks in Kenya. The population of this study consisted of 43 commercial banks in Kenya. The study used a questionnaire to collect the required data. Descriptive statistics such as means, standard deviation and frequency distribution were used to analyze the data. The study found that innovation, firm size and product innovation had a positive relationship with financial performance. Świecka (2018) conducted a study on the effect of financial literacy on the performance of commercial banks in Spain. The study utilized a descriptive research design. The findings of the study showed that cash management skills and knowledge of the customers in making online transactions has promoted the increase in the financial performance of the banks. Matayo (2016) examined the effect of innovation management on the growth of microfinance banks in Nairobi. The study used primary data that was gathered through the use of self-administered structured questions. Data collected was sufficient enough to warranty conclusions about the study. The data was analyzed with the assistance of a statistical package for social sciences software and presented through tables and figures. The findings of the study revealed that microfinance banks in Kenya have been very innovative and this has been occasioned through the introduction of new products, improvements in existing products, adoption of new technologies and improved marketing. The study concluded that Product innovation, marketing innovation and organizational innovation were positively and significantly related to the growth of microfinance institutions.

Wachira and Kihui (2017) sought to examine the impact of financial literacy on access to financial services in Kenya. The main thrust of this study is to establish the impact of financial literacy on

access to financial services in Kenya using the 2009 National Financial Access (FinAccess) survey data. Using a multinomial logit approach to explain access the four major financial service access strands, the study found that financial literacy remains low in Kenya. The regression results indicate that households' access to financial services is based on levels of financial literacy such as cash management skills and making sound financial choices. The study recommended the development of a curriculum on financial education and administer it in local, middle level and higher learning institutions.

2.3.2.1.4 Financial Innovation

Githii and Mwangi (2018) sought to examine the effect of technology-based financial innovations on non-interest income of commercial banks in Kenya. The study investigated how the adoption of ATMs and Cards, Internet and Mobile Banking and use of Funds Transfer Systems such as RTGS and EFT has impacted the non-interest income of commercial banks in Kenya. Descriptive research design was utilized. The study found that technology based financial innovation has significant effect on the non-interest income earned by commercial banks in Kenya. The study recommended all stakeholders in commercial banks to take any investments made towards technology based financial innovation products as a strategy to improve non-interest income.

Maina and Mungai (2019) conducted a study to examine the effect of mobile banking services on the financial performance of tier one commercial banks in Kenya. The study employed descriptive research design. The study targeted 8 tier one commercial banks. The study used secondary data which was obtained from the published financial statements of the tier one commercial banks in Kenya. The results of the study indicated that mobile banking funds transfer has a positive and significant effect on performance. The study concluded that banks should always ensure that the mobile loans are efficient and are sound to facilitate participation of the customers in using the

banking applications loans services. The study recommended the commercial banks need to do much on improving the mobile banking services so to enhance the performance. Kamau and Oluoch (2016) and Muchiri (2017) indicated the growth of cashless transaction is determined by financial innovation, online banking and technology advancement

Kojo and Yazidu (2015) explored the effect of product innovations on the performance of microfinance institutions in Ghana. The study adopted a descriptive research design. The unit of analysis was Kenstep microfinance institutions and Medi Ghana Microfinance. The targeted population was 428 employees, but the sample size was 207. The research collected both primary and secondary data. The findings revealed that product innovations do not influence performance. A contextual gap exists since the survey was conducted in Ghana. Nevertheless, the study presents a contextual gap since it was conducted among microfinance institutions.

Munywoki (2016) studied the effect of innovation on the financial performance of commercial banks in Kenya. Notably, the researcher sought to examine the impact of product innovations, process innovations and marketing innovations on financial performance. The examination adopted descriptive research. The targeted population was 700 respondents but a sample size of 254 was used. The unit of observation included top, middle and lower-level management. The findings reported that all the indicators of innovation under consideration were positively and significantly related to profitability. The study recommended that the commercial banks in the country should embrace the promoting the product innovations, process innovations and marketing innovations so to improve on financial performance.

Mwangi, Kuria and Atheru (2018) investigated the influence of financial innovation on the Performance of Microfinance Banks in Nairobi City County, Kenya. Specifically, the study sought to establish the effect of institutional innovation, process innovation and product innovation and

on performance. The descriptive survey as a research design was applied. The results of the study showed that a positive and significant relationship existed between process innovation, product innovation, institutional innovation and performance. The institution's innovation was inclusive of internet connectivity and computerization of the activities.

Cherotich, Sang, Mutungú and Shisia (2015) analyzed the effect of financial innovations on the performance of commercial banks in Kenya. The specific objectives of the study were to examine the effect of mobile phone services and online banking services on performance. The study utilized the descriptive research design, relied on secondary data and further conducted a census where all the 44 banks were used. The study found out that there is a weak relationship between financial innovations and financial performance. The study concluded that financial innovations (mobile phone services and online banking services) negatively affected financial performance.

2.3.3 Regulatory Framework and Growth of Cashless Transactions

A regulatory framework is a system of regulations and the means to enforce, usually established by the government, to regulate a specific activity (Bidabad, 2019). The regulatory framework includes the existence of the necessary infrastructure which supports the control, direction, or implementation of a proposed or adopted course of action, rule, principle or law (Sreenu, 2020).

A study conducted by Ugwueze and Nwezeaku (2016) indicated that the regulatory framework significantly affects the growth of cashless transactions. The government enacts regulations that facilitate the adoption of internet banking in commercial banks. Moreover, another study conducted by Gola, Burrioni, Columba, Ilari, Nuzzo and Panzarino (2017) showed that the government came up with a regulatory framework with guidelines on how commercial banks should implement internet banking. The government enforces policies that support the installation of better ICT infrastructure like fiber optic cable, reduced internet costs, enhanced better internet

service accessibility, and enhanced the existence of better internet security in the ICT infrastructure.

Moreover, Ndemezo and Kayitana (2018) argued that the issue of the effective regulatory framework that guides the application of cashless transactions services is a key factor that the government has not emphasized, making some banks poorly execute internet banking services. In the absence of an effective regulatory framework, many commercial banks fail to employ effective customer protection systems such as security systems. This lowers the level of customers' confidence in the effectiveness of internet banking services (Siyanbola, 2020). Moreover, it was established by Banegas and Tase (2020) that the lack of an effective regulatory framework for monitoring the application of internet banking operations in commercial banks hinders the government from guiding the commercial banks on how to implement internet banking effectively.

A study was conducted by Mbwayo (2017) to examine factors influencing the adoption of electronic payments by commercial banks in Kenya. The study adopted the descriptive research design, and questionnaires were used to collect the data. The study results showed that the regulatory framework significantly influences the adoption of electronic payments by commercial banks in Kenya. The regulatory frameworks allow the spread of electronic payments while at the same time protecting individuals against fraudulent attacks. Licensed banks or their agents solely authorize an electronic payment system. Additionally, all financial institutions customers carrying out electronic payments' activities must be authorized institutions. The study concluded that the regulatory framework has a significant and positive effect on electronic payments by commercial banks in Kenya.

Furthermore, in another study conducted by Ugwueze and Nwezeaku (2016), the growth of cashless transactions such as e-banking among the commercial banks in Nigeria is highly

influenced by the regulatory framework. The poor telecommunication network policies and slow-paced regulatory initiatives have reduced the growth of cashless transactions. The banking infrastructure in terms of electronic payments and inter-bank connectivity is poor. Moreover, Vutsengwa and Ngugi (2013) found that regulation is one of the factors affecting the growth of electronic payments in the Kenya banking industry.

Moreover, Mutangili, Awuor and Cheluget (2020) sought to examine the controlling effect of the regulatory framework in the relationship between international procurement practices and supply chain performance of energy development agencies in Kenya. The study adopted a cross-sectional survey research design with the aim of collecting the large number of quantitative data at a point in time so as to establish patterns of value addition in the Kenyan energy sector. The study found a significant controlling effect of the regulatory framework in the relationship between international procurement practices and supply chain performance of energy development agencies in Kenya.

In addition, a study was conducted by Shamraev (2019) to look at the influence of Legal and regulatory framework on the payment and e-money services in Brazil, Russia, India, China and South Africa countries. The study utilized the descriptive research design. The collection of the data was done by using the questionnaires. The study results showed that legal and regulatory framework influences the payment and e-money services in Brazil, Russia, India, China and South Africa countries. The central banks in those countries play key roles in their national payment systems, and they each have different statutory authorities on regulation and supervision or oversight of payment services providers, payment schemes and payment systems. The regulations ensure the technologies used in e-money must be secure and ensure robust operations.

2.4 Knowledge Gaps

Based on the reviewed studies, the influence of regulatory framework on the relationship between factors influencing cashless transactions and the growth of cashless is under-researched. The scholars have only illustrated the theoretical understanding of cashless transactions due to the insistency in the findings. The specific factors influencing the growth of cashless transactions in commercial banks in Kenya are currently unknown. Some studies (Teka, 2020; Baganzi & Lau, 2017; Baariu, 2015; Githii & Mwangi, 2018; Maina & Mungai, 2019; Kipng'etich, Chepkilot, & Koima, 2018; Daniyan-Bagudu, Khan & Roslan, 2017) found factors that influence the growth of cashless transactions include perceived risks, mobile banking services, agency banking and strategic factors.

On the contrary, Kamau and Oluoch (2016), Muchiri (2017), Szopiński (2016), Mushkudiani (2018), Taghiyev, Eminov and Guliyev (2016), Munywoki (2016) and Mwangi, Kuria and Atheru (2018) demonstrated that the growth of cashless transaction is determined by financial innovation, strategic alternative banking channels, online banking and technology advancement. Thus, a knowledge gap existed that needed to be ascertained, thus the rationale of conducting the current study. The conducting of the current study was regarded worthy to bridge the existing knowledge gap.

2.5 Conceptual Framework

The conceptual framework helps the reader to see at a glance the proposed relationships between the independent variables and the dependent variable. The conceptual model in Figure 2.1 depicts the relationship between, evolution of the digital currency, factors influencing growth of cashless transactions and growth of cashless transactions.

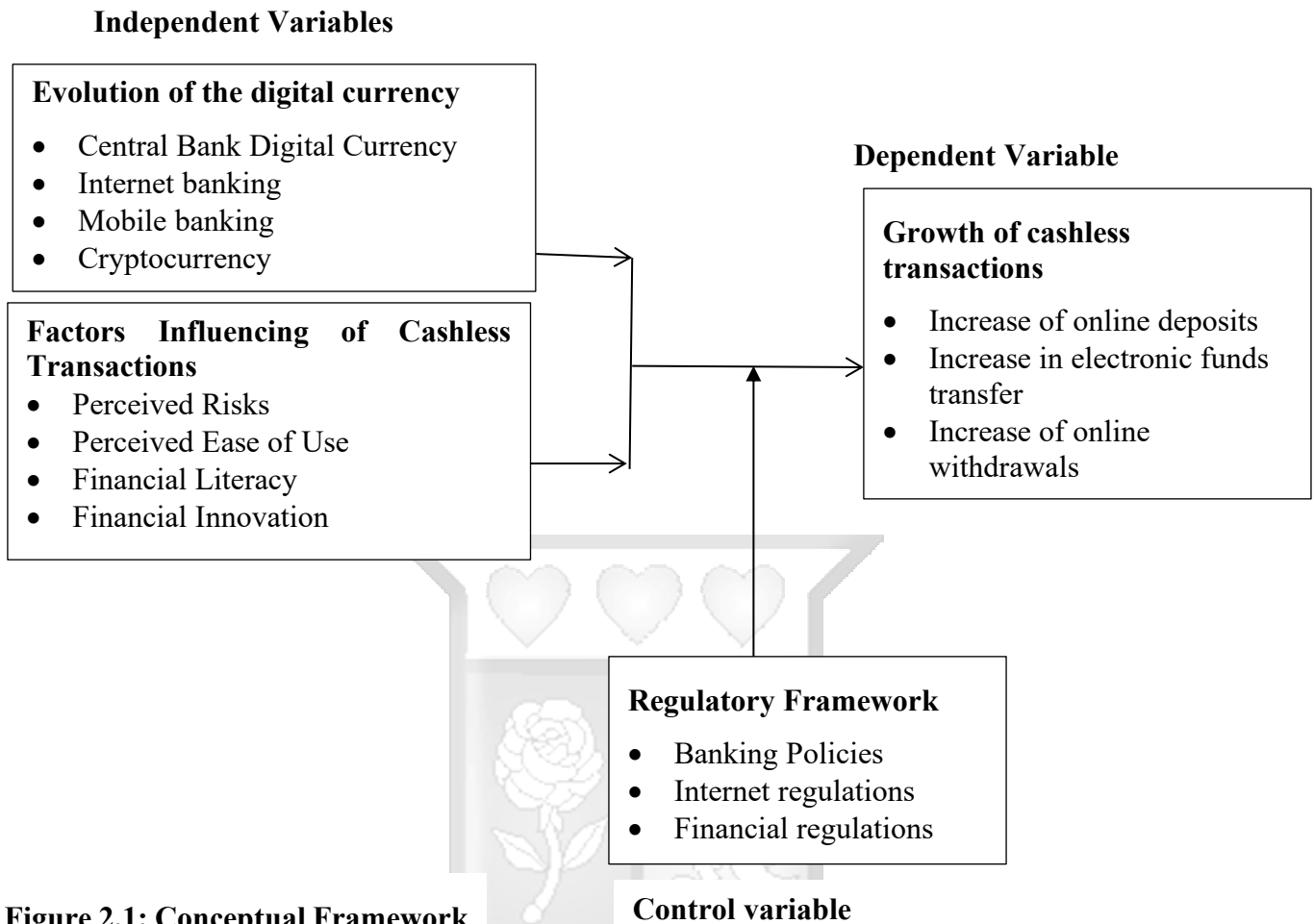


Figure 2.1: Conceptual Framework

The evolution of digital currency has been influenced by internet banking, mobile banking, ease of conducting transactions and financial literacy in online transactions (Choto, 2018). Helfasari, Gamayuni, and Syaipudin (2021) indicate that the growth of cashless transactions includes using mobile applications, automatic teller machines, mobile banking and banking cards. Digital currency is any currency, money, or money-like asset primarily managed, stored or exchanged on digital computer systems, especially over the internet (Helfasari, Gamayuni & Syaipudin, 2021). The central bank digital currency internet banking, mobile banking and cryptocurrency can be considered critical determinants of the evolution of the digital currency in Kenya. Digital

currencies exhibit properties similar to traditional currencies but generally do not have a physical form, unlike currencies with printed banknotes or minted coins.

Perceived risks include the consumer's level of uncertainty regarding the outcome of a transaction decision. The perceived risks of using cash, such as fear of losing money through fraud, the spread of contagious diseases and future references for transactions, could stimulate an individual to settle on using cashless transactions (Baganzi & Lau, 2017). On the other hand, the perceived ease of use is how a person believes an innovation would be effortless. The easy to use, easy to do transactions and easy to understand could influence the growth of cashless transactions (Maina, 2020).

Financial literacy is the possession of skills and knowledge that allows individuals to make informed and effective decisions with all of their financial resources. Financial literacy, which includes cash management skills, knowledge in making online transactions and making sound financial choices, is one of the factors that transpire to transformation to cashless transactions (Szopiński, 2016; Maina & Mungai, 2019). Financial innovation entails creating new financial products, services, or processes to enhance efficiency. Financial innovative products are vital forces for the diversification of banks, thus generating high revenue and minimizing the cost. Mobile applications, credit cards, debit cards and internet banking have been recognized as key in influencing the growth of cashless transactions (Jumba & Wepukhulu, 2019).

The growth of cashless transactions is inevitable can include the increase in online deposits, increase in electronic funds transfers and increase in online withdrawals. The cashless system benefits businesses in which they can increase sales and grow business by providing convenient, safe and faster services to customers in administering transactions (Sreenu, 2020). The importance

of cashless transactions is that it increases the profits of the organizations due to the charges attracted to the customers.

2.6 Operationalization of Variables

Table 2.2 shows how factors influencing growth of cashless transactions (perceived risks, perceived ease of use, financial literacy, financial innovation and regulatory framework) are measured.

Table 2.2 Operationalization of Variables

	Variable	Type of Variable	Measures/Indicators	Measurement scale	Reference
Evolution of the digital currency		Independent variable	• Evolution of the digital currency • Central Bank Digital Currency • Internet banking • Mobile banking • Cryptocurrency	Ordinal	Helfasari, Gamayuni and Syaipudin, (2021); Zafar, Riaz and Mahmood (2021); Choto (2018); Helfasari, Gamayuni, and Syaipudin (2021); Mukamunana (2019); Akintaro (2019); Kariu (2017)
Factors Influencing Growth of Cashless Transactions	Perceived Risks	Independent variable	• Loss of money through fraud • Spread of contagious diseases • Future references for transactions	Ordinal	Baganzi and Lau (2017); Liébana-Cabanillas, Leiva and Fernández (2017); Teka (2020); Baariu (2015)
	Perceived Ease of Use	Independent variable	• Easy to use • Easy to do transactions • Easy to understand	Ordinal	Makanyeza (2017); Amer, Ibrahim, Othman and Md Jani (2020); Liu and Tai (2016); Gumbo, Halimani and Diza (2017); Rono (2014)
	Financial Literacy	Independent variable	• Cash management skills	Ordinal	Uzonwanne and Ezenekwe (2017); Kariu (2017); Daniyan-Bagudu, Khan and Roslan

			• Knowledge in making online transactions • Making sound financial choices		(2017); Mbevi (2015)
	Financial Innovation	Independent variable	• Mobile Apps • Credit/debit cards • Internet banking	Ordinal	Githii and Mwangi (2018); Kojo and Yazidu (2015); Munywoki (2016);
	Regulatory Framework	Controlling variable	• Banking Policies • Internet regulations • Financial regulations	Ordinal	Gola, Burroni, Columba, Ilari, Nuzzo and Panzarino (2017); Mbwayo (2017); Ugwueze and Nwezeaku (2016); Shamraev (2019)
Growth of cashless transactions		Dependent variable	• Increase of online deposits • Increase in electronic funds transfer • Increase of online withdrawals	Ordinal	Panzarino (2017); Teka (2020); Liu and Tai (2016); Gumbo, Halimani and Diza (2017); Matayo (2016); Munywoki (2016); Mwangi, Kuria and Atheru (2018);

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is defined as a detailed set of procedures or steps that are followed during data collection and analysis (Kothari, 2004). The chapter was organized into sections. The section included research philosophy, research design, target population, sample size and sampling technique, data collection instruments, data collection procedure, pilot study, the validity of research instrument, reliability of research instrument, data processing and analysis and ethical consideration. Each of the sections was comprehensively examined.

3.2 Research philosophy

Research philosophy is a glimpse into how data about a phenomenon should be gathered, analyzed and used (Padilla-Díaz, 2015). Research philosophy relates to the foundation of knowledge upon which critical assumptions and predispositions of a study are based. The philosophy has implications on what, how, and why research will be carried out (Saunders, Lewis & Thornhill, 2012). In this study, positivism research philosophy was adopted. Positivism is based on facts gathered through direct observation and measured empirically using quantitative methods and statistical analysis (Creswell & Clark, 2017). The fundamental difference between positivism and other philosophies lies in the realm of theory whereby data within positivism is theory-driven and designed to test the accuracy of the theory. Predictions can thus be arrived at on the premise of the previously observed and explained realities and their inter-relationships.

Positivist philosophy reveals that knowledge is based on facts and that no abstractions or subjective status of individuals is considered (Singh, 2015). The positivist philosophical approach is based

on the observable social entity. The research strategy is approached based on data gathering and theory advancement (Adam, 2014). Further, positivism works on quantifiable observations and accordingly, statistical analysis is obtained. Therefore, positivism was considered the most appropriate research philosophy in the current study to examine the influence of regulatory framework on the relationship between factors influencing cashless transactions and growth of cashless transactions. The justification for choosing the positivist philosophy was because it shows that knowledge is based on facts and that no abstractions or subjective status of individuals is considered. The research strategy is approached based on data gathering and theory advancement. Thus, since the influence of regulatory framework on the relationship between factors influencing cashless transactions and the growth of cashless is under-researched due to the inconsistency in findings, the positivist philosophy was considered the most appropriate.

3.3 Research design

Research design is a framework that is employed to create answers to examiners' concerns. This study adopted the explanatory research design that was a quantitative approach. According to Rahi (2017), the explanatory research design is suitable when the research wants to get a better understanding of an issue and to come up with new ideas on what should be done to improve the current situation. Besides, Subedi (2016) established that the explanatory research design is used to develop hypotheses that can explain the occurrence of specific phenomena and is research conducted for a problem that has not been studied more clearly. The explanatory research design depicts the attributes of a specific circumstance, occasion, or case without manipulation of the variables (Patten & Newhart, 2017). The justification for choosing the explanatory research design was because information regarding the relationship between factors influencing cashless transactions and the growth of cashless is scanty. The inconsistency makes it hard to have a

conclusive inference regarding the relationship between factors influencing cashless transactions and the growth of cashless. Therefore, the explanatory research design was considered the most relevant design. The data were analyzed using descriptive and inferential statistics and was presented in Tables and charts.

3.4 Target population

Population refers to an entire group of objects having common observable characteristics (Cooper & Schindler, 2014). The population often tends to have a wide geographical spread, and, in most cases, the research is not necessarily interested in the total or universal population (Kothari, 2004). The target population of this study was all 41 licensed commercial banks in Kenya. From the official Central Bank of Kenya Report (2020), there are 41 licensed commercial banks in Kenya, as presented in Appendix I. Hence, the 41 commercial banks formed the unit of analysis.

3.5 Sample size and sampling technique

The sample size is a subset of the population (Creswell, 2014). The sampling technique refers to the process by which a relatively small number of individuals, objects, or events are selected from the entire population (Cooper & Schindler, 2014). The sample size were 41 commercial banks. Thus, a census was conducted. A census is conducted when the target population is small and manageable. The target population in the current study was 41 firms, and thus they are few and manageable. The importance of conducting the census was that it gave a detailed information on the population and no biasness. Therefore, the study made precise inferences regarding factors influencing the growth of cashless transactions in commercial banks in Kenya since all the banks will be included in the analysis.

The study used a stratified random sampling technique to select the respondents. Stratified random sampling is a method of sampling that involves the division of a population into smaller sub-groups

known as strata. The groups or strata was organized based on the departments. The study chose those departments that are more involved with finance and technology. Those departments were regarded as the most effective to give thorough details regarding the extent of the cashless transactions within the banks. The unit of observation were managers from the human resource department, finance department, marketing department and ICT department, while the unit of analysis were 41 commercial banks.

The researcher randomly picked two managers from each of the four strata (human resource department, finance department, marketing department and ICT department). The rationale for picking only two managers was to compare the results and ensure there is no monotony of only using one manager. The two managers were regarded to be sufficient to give detailed information regarding the internal operations and especially on the cashless transactions. The sample size from the unit of analysis (banks) is summarized in Table 3.1.

Table 3.1: Sample Size

Category	Determinations/calculations	Sample Size of Managers
Managers from human resource department	2*41	82
Managers from finance department	2*41	82
Managers from marketing department	2*41	82
Managers from ICT Department	2*41	82
Total		328

Source: Researcher (2022)

3.6 Data Collection Instruments

The study used questionnaires to collect the data. The questionnaire were developed using reference to the conceptual framework of the study. It was structured with a 5-point type Likert scale, which is an interval scale that specifically uses five anchors designated as: strongly disagree, disagree, neutral, agree and strongly agree. The Likert scale measures the level of agreement or disagreement and is good in measuring perception, attitude, and values (Nguyen, 2019). A Likert scale is preferred because it will enable the research to convert responses into a quantitative format for ease of data analysis using computer-based software. The study used a 5-point Likert scale where 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is strongly agree.

Managers from the human resource department, finance department, marketing department and ICT Department were key respondents. The justification for picking the managers as the most appropriate persons to fill the questionnaires was because they are involved in the decision-making process in an organization. The researcher randomly picked two managers from the human resource department, finance department, marketing department and ICT department. The concept of growth of cashless transactions cuts across departments; therefore, the four departments (human resource department, finance department, marketing department and ICT department) were ideal in providing the relevant data.

3.7 Data collection procedure

Before embarking on data collection, the researcher sought authority from the office of the post-graduate students. After obtaining research approval from the university to conduct the study, permission was also sought from the management of the commercial banks through their research ethics committees. As a fulfillment of the mandatory ethical requirements, the researcher obtained a research permit from the National Commission for Science, Technology, and Innovation

(NACOSTI). Moreover, an authority letter from Institutional Review Board (IRB) was obtained. The researcher contacted/approached the managers from the human resource department, finance department, marketing department and ICT Department using mails, telephone calls and verbal communication. Respondents were assured of strict confidentiality in their responses. The questionnaires were self-administered.

Due to the aspect of the COVID-19 pandemic, the researcher used google form surveys in most cases. The researcher trained two research assistants on how to use the google form to enhance data collection. In case the data collection through google form surveys was not adequate, the researcher with two research assistants visited the organizations to deliver the printed questionnaires and also explain to them the importance of having to respond through the google forms survey. The use of mails, telephone calls and verbal communication was used to increase the response rates. The response rate was 79 managers from the human resource department, 81 from the finance department, 72 from the marketing department and 77 from ICT Department. The response rate was 309 out of the anticipated 328.

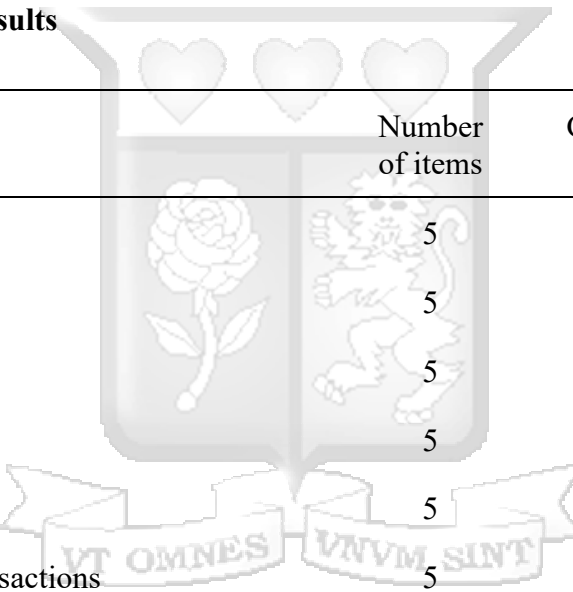
3.8 Pilot test

A pilot test or pre-test of the questionnaire was carried out among 33 respondents. This represented 10% of the population study sample. This helped to check the reliability and validity of the study tools. Saunders, Lewis and Thornhill (2012) explained that pilot testing helps refine the questionnaire so that respondents have no problem answering questions and there will be no problem recording data.

3.8.1 Reliability of Research Instrument

Reliability is the consistency of estimation, or how much an instrument measures a similar way each time it is utilized under the same condition with related subjects (Cronbach, 1951). The researcher calculated the Cronbach alpha coefficient to examine the reliability of the research instruments. Cronbach Alpha is used to measure the internal consistency of items in the questionnaire (Carmines & Zeller, 1979). The reliability was calculated using Cronbach 's alpha formula and results were generated with the aid of SPSS and the results are presented in Table 3.2

Table 3.2: Reliability Results



Variable	Number of items	Cronbach alpha	Comments
Perceived Risks	5	0.814	Reliable
Perceived Ease of Use	5	0.762	Reliable
Financial Literacy	5	0.807	Reliable
Financial Innovation	5	0.851	Reliable
Regulatory Framework	5	0.727	Reliable
Growth of Cashless Transactions	5	0.836	Reliable

Source: Field Data (2022)

The results in Table 3.2 show Cronbach's alpha coefficients for perceived risks, perceived ease of use, financial literacy, financial innovation, regulatory framework and growth of cashless transactions were above 0.7, indicating that they are reliable. Taber (2018) suggests that Cronbach's alpha values of items included in the study should not be lower than 0.7. According to Golafshani (2003), Cronbach alpha should not be lower than 0.7, while Gliem and Gliem (2003)

recommend a Cronbach alpha should exceed 0.7. Hence, the variables of the study were considered reliable.

3.8.2 Validity of Research Instrument

To achieve content validity, procedures recommended by Cooper and Schindler (2014) were used. Precisely, identification of the existing scales from the literature, developing data collection instrument and administering it to the supervisor in charge of the dissertation and bank experts. Modifications arising from these experts were in-cooperated in the survey tool for clarity, comprehensiveness, relevance, meaning and requisite depth. The supervisor did a final review of the data collection tool and their valuable recommendations were used to finalize the instrument. Moreover, the study used Keyser Meyer Olkin (KMO) and the test of Sphericity as used by (Dikko, 2016) to examine the construct validity. The test measures sampling adequacy for each variable in the model and the complete model. The statistic measures the proportion of variance among variables that might be common variance. The lower the proportion, the more suited your data is to factor analysis. The study embraced a variable reduction approach to reduce the number of statements that do not meet the threshold in the dataset. The rule of thumb is that if the KMO value is more than 0.4 and the P-value of Sphericity is less than 0.05, then the statements are valid / it measures what it purports to measure. Results are presented in Table 3.3

Table 3.3: Construct Validity

Variable	KMO Value	Sphericity
Perceived Risks	0.793	0.000
Perceived Ease of Use	0.716	0.000
Financial Literacy	0.773	0.000
Financial Innovation	0.811	0.000
Regulatory Framework	0.747	0.000
Growth of Cashless Transactions	0.752	0.000

Source: Field Data (2022)

Results in Table 3.3 show that perceived risks had a KMO value of 0.793 and Barlette's test of sphericity of $0.000 < 0.05$ and thus, the statements are valid/it measures what its purport to measure. Perceived ease of use had a KMO value of 0.716 and Barlette's test of sphericity of $0.000 < 0.05$ and thus the statements are valid/it measures what its purports to measure. Financial Literacy had a KMO value of 0.773 and Barlette's test of sphericity of $0.000 < 0.05$ and thus the statements are valid/it measures what its purports to measure. Financial innovation had a KMO value of 0.811 and Barlette's test of sphericity of $0.000 < 0.05$ and thus the statements are valid/it measures what its purports to measure. Regulatory framework had a KMO value of 0.747 and Barlette's test of sphericity of $0.000 < 0.05$ and thus the statements are valid/it measures what its purports to measure. Lastly, the growth of cashless transactions had a KMO value of 0.752 and Barlette's test of sphericity of $0.000 < 0.05$ and thus the statements are valid/it measures what its purports to measure.

3.9 Data processing and analysis

Data analysis is the process of converting raw data into a readable format that can be interpreted, analyzed and used (Chakravarthy & Jiang, 2009). The collected data was first cleaned to ensure it

is error-free before the processing. Afterward, it was imported to Statistical Package for the Social Sciences (SPSS). The SPSS was used to organize, code and analyze information and generate the quantitative report. The data was analyzed using descriptive and inferential statistics and was presented in Tables and charts. The descriptive statistics included mean, standard deviation, percentages and frequencies, while the inferential statistics included the correlation and regression analysis. Under the regression analysis, the model fitness, analysis of variance and regression coefficients were presented. The multiple regression analysis demonstrated the relationship between the variables. The multiple regression was;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: -

Y= Growth of cashless transactions

X₁= Perceived Risks

X₂= Perceived Ease of Use

X₃= Financial Literacy

X₄= Financial Innovation

β₀ = Constant

β₁, β₂, β₃ & β₄= Coefficients

ε = Error term

Moreover, the regulatory framework was used as a controlling variable. The controlling variable (regulatory framework) was presented by M. In accordance with Whisman and McClelland (2005), the controlling effect model was built in two steps. In step one, the regulatory framework was used as a predictor variable. In step two, perceived risks, perceived ease of use, financial literacy and financial innovation, regulatory framework and interactions between regulatory

framework and perceived risks, perceived ease of use, financial literacy and financial innovation were regressed against growth of cashless transactions. In step one, the regression model for testing the control effects is captured below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + M + \varepsilon$$

Where: -

Y= Growth of cashless transactions

X₁= Perceived Risks

X₂= Perceived Ease of Use

X₃= Financial Literacy

X₄= Financial Innovation

M=Regulatory framework

β₀ = Constant

β₁, β₂, β₃ & β₄= Coefficients

ε = Error term

In step two, the regression model for testing the control effects is captured below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + M + \beta_1 X_1 * M + \beta_2 X_2 * M + \beta_3 X_3 * M + \beta_4 X_4 * M + \varepsilon$$

Where: -

Y= Growth of cashless transactions

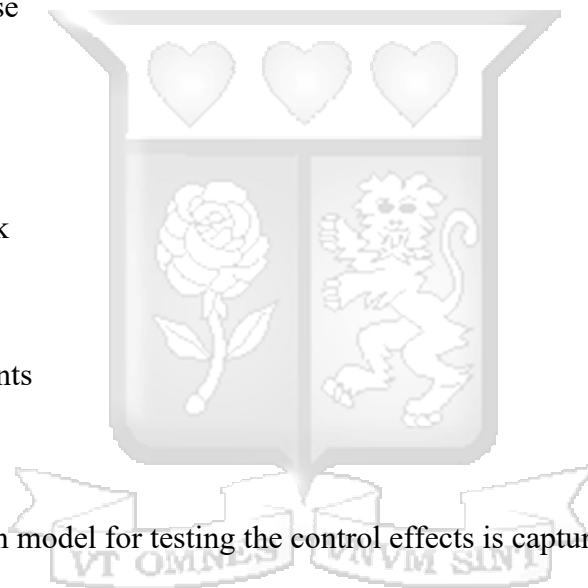
X₁= Perceived Risks

X₂= Perceived Ease of Use

X₃= Financial Literacy

X₄= Financial Innovation

M=Regulatory framework



$X_1M = \text{Perceived Risks} * \text{Regulatory framework}$

$X_2M = \text{Perceived Ease of Use} * \text{Regulatory framework}$

$X_3M = \text{Financial Literacy} * \text{Regulatory framework}$

$X_4M = \text{Financial Innovation} * \text{Regulatory framework}$

$\beta_0 = \text{Constant}$

$\beta_1, \beta_2, \beta_3 \text{ \& } \beta_4 = \text{Coefficients}$

$\varepsilon = \text{Error term}$

3.10 Ethical Considerations

The research sought the permission through a letter of authority from NACOSTI and Strathmore University before embarking on the data collection. Besides, the respondents were asked to give consent to their willingness to participate in the study freely. The researcher ensured the information given was used for academic research and that no access to the information was allowed except the main ones who had been scheduled to be part of the study. A soft copy of the research findings can be given to any of the organization upon request.

CHAPTER FOUR

PRESENTATION, DISCUSSION AND INTERPRETATION OF FINDINGS

4.1 Introduction

The purpose of the study was to examine the influence of the regulatory framework on the growth of cashless transactions in commercial banks in Kenya. Particularly, the study sought to evaluate the extent of evolution of the digital currency in Kenya, establish factors influencing the growth of cashless transactions of commercial banks in Kenya and examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya. Notably, the chapter is organized as follows: response rate, demographic information, descriptive analysis, factors analysis, inferential analysis and chapter summary. Each section is comprehensively presented to enhance its relevance for inclusion in the study.

4.2 Response Rate

The number of questionnaires administered to the managers from the human resource department, finance department, marketing department, and ICT Department from the banks was 328. Out of the 328 questionnaires administered, 309 were duly filled and returned. The summary of the response rate is presented in Table 4.1

Table 4.1: Response Rate

Category	Total participants	Participated	Percentage
Managers from human resource department	82	79	96.34
Managers from finance department	82	81	98.78
Managers from marketing department	82	72	87.80
Managers from ICT Department	82	77	93.90
Total	328	309	94.21

Source: Field Data (2022)

Based on the results presented in Table 4.1, the average response rate was 94.21%. In addition, none of the response rates from either manager from the human resource department, finance department, marketing department or ICT Department was less than 85%. According to Kothari (2004), a response rate of above 50% is adequate for a descriptive study. Dattalo (2008) also asserted that responses above 50% are acceptable to analyze and publish, 60% are good, 70% very good and 80% and above excellent. Based on these assertions from renowned scholars, the response rate was above 80%, hence excellent for the analysis and inferences.

4.3 Demographic Information

Demographics are characteristics of a population. Socio-demographic data provides information regarding research participants and is necessary to determine whether the individuals in a particular study are a representative sample of the target population for generalization purposes. The demographic information the study sought to examine included the gender of the respondents, age bracket, highest academic attainment, period worked in the bank and department working in the bank. The summary of the demographic information is presented in Table 4.2

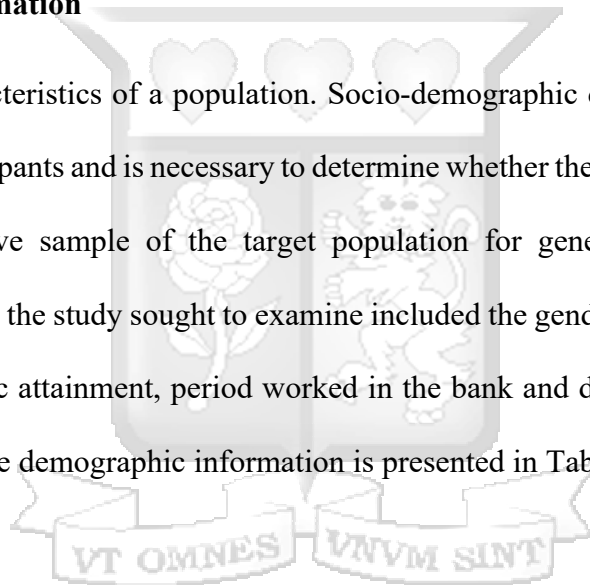


Table 4.2: Demographic information

Demographic Information	Category	Percentage
Gender of Respondents	Male	71.50
	Female	28.50
Age Bracket of Respondents	30 years and below	10.40
	31-40 years	47.20
	41-50 years	35.30
	Over 50 years	7.10
Highest Academic Attainment of Respondents	Degree	35.90
	Masters	49.80
	PhD	14.30
Period Respondents Worked in the Bank	Less than a year	2.30
	1 to 3years	5.80
	4 to 6 years	19.70
	Above 6 years	72.20
Department Working in the Bank	Human resource department	25.60
	Finance department	26.20
	Marketing department	23.30
	ICT department	24.90

Source: Field Data (2022)

Based on the study results presented in Table 4.2, the majority (71.50%) of the managers from the human resource department, finance department, marketing department, and ICT Department from the banks were males. The females were 28.50 % of the respondents. The results pointed women are not equally included as men in the management position within the banks. Hence, there is a need to empower women to have equal opportunities as men in society. The majority (47.20%) of the respondents were aged between 31 and 40 years. Similarly, those aged between 41 and 50 years were 35.30% and 10.40% were aged between 30 Years and below. Finally, it was found that the

respondents aged over 50 years were 7.10%. The results signified that most of the respondents were aged between 31 and 50 Years (47.20%; 35.30%); thus, this age group is expected to be more competent and innovative since they are not either very old or young. The age of the respondents also indicates the level of maturity of individuals.

The results presented in Table 4.2 indicate that 49.80% of the respondents had a master's degree as the highest academic qualification, while 33.90% had a degree and finally, 14.30% were doctorates (PhD holders). The study results signify that most of the respondents were knowledgeable to be innovative and creative in developing strategies that can enhance the growth of cashless transactions. Knowledge and a high level of education are prerequisites for achieving successful results. The achievement of a higher level of education increases the precondition for its successful results in the management and involvement of institutions.

It was found that 72.20% of the respondents had worked in the bank for the above years. In addition, 19.70% had worked in the bank for between 4 and 6 years, 5.80% for between 1 and 3 years and finally, those who had worked in the bank for less than a year were 2.30%. The results presented imply that the majority of the respondents had worked for a considerable period and thus had an experience of more than six years; hence their opinions were considered appropriate for the study. The study results presented in Table 4.2 indicate that 26.20% of the respondents were managers from the finance department, 25.60% from the human resource department, 24.90% from the ICT department and 23.30% from the marketing department. The results implied that representation from each category of the respondents was well represented.

4.4 Descriptive Analysis

The descriptive analysis shows the general description of the data. This section contains a descriptive analysis of evolution of digital currency in Kenya, perceived risks, perceived ease of

use, financial literacy, financial innovation, regulatory framework and growth of cashless transactions.

4.4.1 Evolution of Digital Currency in Kenya

The first objective of the study was to evaluate the extent of the evolution of the digital currency in Kenya. The study found that the Central Bank of Kenya proposes introducing a digital currency in the country in a move that could ease cross-border payments and complement mobile money in the local market. The relevance of Central Bank Digital Currency (CBDC) is that it is a virtual version of the shilling, exchangeable one-to-one with physical cash. The study noted that CBDCs would usher in a new era of money if successful. Moreover, it was established that mobile money had been highly attributed to the evolution of digital currency in Kenya.

Mobile money in Kenya helps make financial transactions across long-distance with mobile phones, reducing travel costs and eliminating the risks of carrying cash, and avoiding most high bank charges. Further, the growth of cashless transactions is highly attributed to the outbreak of the Covid 19 pandemic. The risks associated with using cash amid the Covid 19 pandemic are stimulating the high adoption of cashless transactions. It was established that the type of digital currency includes cryptocurrency, virtual currency and central bank digital currency. Commercial banks have adopted cashless transactions due to technological advancements and high innovation.

The evolution of digital currency in Kenya has been influenced by internet banking, mobile banking, ease of conducting transactions, financial literacy in online transactions and safety associated with digital transactions, such as privacy. Customers prefer cashless transactions due to their efficiency and flexibility. The evolution of digital currency includes mobile applications, automatic teller machines, mobile banking and banking cards. A study by Choto (2018) found that technology, financial trends and legal frameworks significantly impact the adoption of virtual

currency in organizations. Helfasari, Gamayuni, and Syaipudin (2021) indicate that the growth of cashless transactions includes using mobile applications, automatic teller machines, mobile banking and banking cards.

Pal, Chandra, Kameswaran, Parameshwar, Joshi, and Johri (2018) indicates the evolution of cashless transactions has led to banking cards, mobile banking, national electronic funds transfer, automatic teller machines and mobile applications. Akintaro (2019) asserts that mobile money in Kenya is helping low-income communities make financial transactions across long-distance with their mobile phones, reducing travel costs, eliminating the risks of carrying cash, and avoiding most high bank charges. Moreover, another study conducted by Kotkowski and Polasik (2021) showed that the Covid-19 pandemic had accelerated cashless transactions.

4.4.2 Factors Influencing Growth of Cashless Transactions

The second objective of the study was to establish factors influencing the growth of cashless transactions in commercial banks in Kenya. It was revealed that perceived risks, perceived ease of use, financial literacy and financial innovation are some of the factors influencing the growth of cashless transactions in commercial banks in Kenya.

4.4.2.1 Perceived Risks

The descriptive analysis for perceived risks is presented below in Table 4.3. A Likert scale of 1 to 5 (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree) was used. The Likert scales helped to quantify the responses

Table 4.3: Descriptive Analysis on Perceived Risks

Statements	Mean	Median	Std. Deviation
Loss of money through fraud influences growth of cashless transactions within the bank	4.03	4.00	0.90
Fear of spreading contagious diseases influences the growth of cashless transactions within the bank	3.78	4.00	1.14
Importance of having a future reference for any transaction influences growth of cashless transactions	4.17	4.00	1.02
The risks of kidnapping and theft influences the growth of the cashless transactions	4.02	4.00	0.95
The risk of having fake money influences the growth of cashless transactions	4.07	4.00	1.09
Average	4.01	4.00	1.02

Source: Field Data (2022)

Based on the study results presented in Table 4.3, most respondents agreed that loss of money through fraud influences the growth of cashless transactions within the bank because the mean score was 4.03, with a standard deviation of 0.90. Further, most respondents agreed that fear of spreading contagious diseases influences the growth of cashless transactions within the bank, as the mean score of the survey question was 3.78, with a standard deviation of 1.14. In addition, most respondents agreed that having a future reference for any transaction influences the growth of cashless transactions since the mean score was 4.17, with a standard deviation of 1.02.

The study revealed that most respondents agreed that the risks of kidnapping and theft influence the growth of cashless transactions with a mean score of 4.02, with a standard deviation of 0.95. Moreover, most respondents agreed that the risk of having fake money influences the growth of cashless transactions because the mean score was 4.07, with a standard deviation of 1.09. The average mean score of the survey questions was 4.01, with a standard deviation of 1.02. This

implied that the majority of the respondents agreed with the survey questions. The median value was 4.00 in all the statements. The Median is the middlemost value of the given data that separates the higher half of the data from the lower half. It is the value that splits the dataset in half. Thus, the middle value in the data set was 4.00 and this implies that the majority of the respondents were on the agreeing side.

Further, from the open-ended questions, it was revealed that uncertainty regarding mobile payment authorization increases cashless transactions. Customers expect mobile payment to improve the efficiency of daily tasks. Factors associated with perceived risk such as privacy, financial, psychological, physical, trust, social risk and future references for transactions influence the growth of cashless transactions. Moreover, time-loss risk and security are the most dominant risks that influence consumer involvement with electronic payments. The provision of a method of confirming the identity of the business one has registered on the system reduces the possibility of losing money, thus spurring cashless transactions.

4.4.2.2 Perceived Ease of Use

The descriptive analysis for perceived ease of use is presented below in Table 4.4. A Likert scale of 1 to 5 (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree) was used. The Likert scales helped to quantify the responses

Table 4.4: Descriptive Analysis on Perceived Ease of Use

Statements	Mean	Median	Std. Deviation
The easiness to use online platforms influences the growth of cashless transactions	3.76	4.00	0.94
The easiness of conducting cashless transactions influences its growth	3.98	4.00	1.06
The easiness of understanding the online platforms and mobile banking influences the growth of cashless transactions	4.12	4.00	1.10
The flexibility in using the cashless transactions influences its growth	4.05	4.00	1.09
The simplicity of mobile applications and other internet banking influences its growth	4.09	4.00	1.03
Average	4.00	4.00	1.04

Source: Field Data (2022)

The study results presented in Table 4.4 indicate that most respondents agreed that the ease of using online platforms influences the growth of cashless transactions since the mean score was 3.76 with a standard deviation of 0.94. Further, most respondents agreed that the easiness of conducting cashless transactions influences its growth since the mean score was 3.98 with a standard deviation of 1.06. Moreover, most respondents agreed that the easiness of understanding the online platforms and mobile banking influences the growth of cashless transactions because the mean score of the survey question was 4.12, with a standard deviation of 1.10. The study revealed that most respondents agreed that the easiness of understanding the online platforms and mobile banking influences the growth of cashless transactions since the mean score of the survey question was 4.05, with a standard deviation of 1.09. Finally, most respondents agreed that the simplicity of mobile applications and other internet banking influences its growth, with a mean score of 4.09 and a standard deviation of 1.03.

The average mean score was 4.00, with a standard deviation of 1.04. This implied that most of the respondents agreed with the survey questions under perceived ease of use. The median value was 4.00 in all the statements. Thus, majority of the respondents were on the agreeing side. Further, from the open-ended questions, it was revealed that perceived ease of use of mobile banking affects mobile banking adoption. The perceived ease of use, usefulness and risk are significant factors in adopting the cashless payment system. The perceived usefulness highly influences the behavioral intention to use mobile money services; that is, if people perceive technology as useful, their behavioral intention to use it increases.

4.4.2.3 Financial Literacy

The descriptive analysis for financial literacy is presented below in Table 4.5. A Likert scale of 1 to 5 (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree) was used.

The Likert scales helped to quantify the responses

Table 4.5: Descriptive Analysis on Financial Literacy

Statements	Mean	Median	Std. Deviation
Cash management skills of the customers influences the growth of cashless transactions	4.04	4.00	0.97
Knowledge in making online transactions influences the growth of cashless transactions	4.16	4.00	1.01
Making sound financial choices influences the growth of cashless transactions	3.90	4.00	1.05
Basic knowledge of the customers influences the growth of cashless transactions	3.68	4.00	1.21
Literacy in mobile application and internet banking influences the growth of the cashless transactions	4.06	4.00	1.01
Average	3.97	4.00	1.05

Source: Field Data (2022)

The study results presented in Table 4.5 indicate that most respondents agreed that the cash management skills of the customers influence the growth of cashless transactions, as the mean score was 4.04 with a standard deviation of 0.97. Moreover, most of the respondents agreed that knowledge of making online transactions influences the growth of cashless transactions since the mean score was 4.16 with a standard deviation of 1.01. The study found that most of the respondents agreed that making sound financial choices influences the growth of cashless since the mean score was 3.90 with a standard deviation of 1.05.

Further, the study found that most respondents agreed that basic customer knowledge influences cashless transactions' growth because the mean score was 3.68, with a standard deviation of 1.21. The study established that most respondents agreed that literacy in mobile applications and internet banking influences the growth of cashless transactions since the mean score of the survey question was 4.06 with a standard deviation of 1.01. The average mean score of the survey questions was 3.97, with a standard deviation of 1.05. This implied that most respondents agreed with the survey questions under financial literacy. The median value was 4.00 in all the statements. The median value is the middlemost value of the given data that separates the higher half of the data from the lower half. Hence, the majority of the respondents were on the agreeing side.

Moreover, from the open-ended questions, it was established that literacy in mobile banking, internet connectivity and agency banking positively spur the growth of cashless transactions. The customers' cash management skills and knowledge in the making online transactions have promoted the development of cashless transactions. The households' access to financial services is based on levels of financial literacy such as cash management skills and making sound financial choices. Financial literacy is the possession of skills and knowledge that allows individuals to

make informed and effective decisions with all of their financial resources, which has influenced the growth of cashless transactions.

4.4.2.4 Financial Innovation

The summary of the descriptive analysis for financial innovation is presented in Table 4.6. A Likert scale of 1 to 5 (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree) was used. The Likert scales helped to quantify the responses.

Table 4.6: Descriptive Analysis on Financial Innovation

Statements	Mean	Median	Std. Deviation
Availability of mobile application influence the growth of cashless transactions	3.96	4.00	1.03
Availability of the credit cards influences the growth of cashless transactions	4.08	4.00	1.09
Innovation of mobile banking has increased the growth of cashless transactions	4.11	4.00	0.87
Availability of the debit cards influences the growth of cashless transactions	4.07	4.00	1.03
Internet banking influences the growth of cashless transactions	4.02	4.00	0.99
Average	4.05	4.00	1.00

Source: Field Data (2022)

It was found that most of the respondents agreed that the availability of mobile application influence the growth of cashless transactions, as the mean score of the survey question was 3.96, with a standard deviation of 1.03. Moreover, most of the respondents agreed that the availability of credit cards influences the growth of cashless transactions since the mean score of the survey question was 4.08, with a standard deviation of 1.09. The study further showed that most of the respondents agreed that the innovation of mobile banking had increased the growth of cashless

transactions because the mean score of the survey question was 4.11, with a standard deviation of 0.87.

In addition, most respondents agreed that debit cards' availability influences the growth of cashless transactions because the mean score of the survey question was 4.07 with a standard deviation of 1.03. The study also found that most respondents agreed that internet banking influences the growth of cashless transactions since the mean score of the survey question was 4.02, with a standard deviation of 0.99. The average mean score of the survey questions under financial innovation was 4.05, with a standard deviation of 1.00. This implied that most of the respondents agreed with the survey questions under variable financial innovation. The median value was 4.00 in all the statements and it implied that the majority of the respondents agreed with the statements. Further, from the open-ended questions, it was revealed that financial innovation of ATMs Cards, internet and mobile banking, and funds transfer systems such as RTGS and EFT had enhanced the growth of cashless transactions. The development of cashless transactions is determined by financial innovation, online banking and technological advancement. Financial innovation entails creating new financial products, services, or processes to enhance efficiency. Financial innovative products are vital forces for diversification and increasing online transactions. Mobile applications, credit cards, debit cards and internet banking are potent in influencing the growth of cashless transactions.

4.4.3 Regulatory Framework

The third objective of the study was to examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya. The description of the descriptive analysis for the regulatory framework is depicted in Table 4.7. A Likert scale of 1 to 5 (1= Strongly

Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) was used. The Likert scales helped to quantify the responses.

Table 4.7: Descriptive Analysis on Regulatory Framework

Statements	Mean	Median	Std. Deviation
Banking policies influences the growth of cashless transactions	4.06	4.00	0.99
Growth of cashless transactions has been influenced by the internet regulations	3.92	4.00	1.05
Financial regulations influence the growth of cashless transactions	4.01	4.00	1.18
Government requirements influence the growth of cashless transactions	4.05	4.00	1.00
Regulatory framework significantly influences the adoption of electronic payments	3.67	4.00	1.20
Average	3.94	4.00	1.08

Source: Field Data (2022)

The study finds that most respondents agreed that banking policies influence the growth of cashless transactions since the mean score of the survey question was 4.06, with a standard deviation of 0.99. Moreover, the study found that most of the respondents agreed that the growth of cashless transactions had been influenced by the internet regulations since the mean score of the survey question was 3.92, with a standard deviation of 1.05. The study further showed that most of the respondents agreed that financial regulations influence the growth of cashless transactions because the mean score of the survey question was 4.01, with a standard deviation of 1.18.

The study showed that most respondents agreed that government requirements influence the growth of cashless transactions since the mean score of the survey question was 4.05, with a standard deviation of 1.00. The study showed that most respondents agreed that the regulatory framework significantly influences the adoption of electronic payments since the mean score was

3.67, with a standard deviation of 1.20. The average mean score was 3.94, with a standard deviation of 1.08. This signified that most respondents agreed with the survey questions developed under the variable regulatory framework. The median value was 4.00 in all the statements. The median value splits the dataset in half. Hence, the majority of the respondents were agreeing with the statements.

Further, from the open-ended questions, it was revealed that government enacts regulations that facilitate the adoption of internet banking in commercial banks. The government enforces policies that support the installation of better ICT infrastructure like fiber optic cable, reduced internet costs, enhanced better internet service accessibility, and enhanced better internet security in the ICT infrastructure. In the absence of an effective regulatory framework, many commercial banks may fail to employ effective customer protection systems such as security systems. The lack of an effective regulatory framework for monitoring the application of internet banking operations in commercial banks hinders the government from guiding the commercial banks on how to implement internet banking effectively. The regulations ensure the technologies used in e-money must be secure and ensure robust operations.

4.4.4 Growth of Cashless Transactions

The dependent variable in the study was the growth of cashless transactions. The description of the descriptive analysis for the growth of cashless transactions is depicted in Table 4.8. A Likert scale of 1 to 5 (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree) was used. The Likert scales helped to quantify the responses.

Table 4.8: Descriptive Analysis on Growth of Cashless Transactions

Statements	Mean	Median	Std. Deviation
The bank has reported an increase of online deposit in the last five years	4.02	4.00	1.10
The electronic funds transfer at the bank has been increasing in the last five years	3.79	4.00	1.04
The bank has reported an increase in online withdrawals in the last five years	4.13	4.00	1.02
ATM services have attracted more depositors for the bank.	4.04	4.00	1.03
The number of customers using mobile application has increased in the last five years	4.06	4.00	0.97
Average	4.01	4.00	1.03

Source: Field Data (2022)

The study results presented in Table 4.8 indicate that most respondents agreed that the bank has reported an increase in online deposits in the last five years since the mean score of the survey question was found to be 4.02, with a standard deviation of 1.10. Moreover, it was found that most of the respondents agreed that the electronic funds transfer at the bank has been increasing in the last five years because the mean score of the survey question was found to be 3.79, with a standard deviation of 1.04. In addition, the study established that most respondents agreed that the bank has reported an increase in online withdrawals in the last five years since the mean score of the survey question was 4.13, with a standard deviation of 1.02.

It was revealed that most of the respondents agreed that ATM services had attracted more depositors for the bank because the mean score of the survey question was 4.04, with a standard deviation of 1.03. Further, it was reported that most of the respondents agreed that the number of customers using mobile applications has increased in the last five years since the mean score of the survey question was 4.06, with a standard deviation of 0.97. The average mean score of the

survey questions undergrowth of cashless transactions was 4.01, with a standard deviation of 1.03. This implied that most respondents agreed with the survey questions under the variable growth of cashless transactions. The median value was 4.00 in all the statements. The median value refers to the middle value in a data set. Hence, the majority of the respondents agreed with the survey questions.

Moreover, from the open-ended questions, it was established that the growth of cashless transactions among commercial banks is influenced by financial innovations, financial literacy and the easiness of conducting online transactions. The risks related to cash transactions, such as loss of money through fraud, lack of future references, cash theft and currency fraud, have led to the growth of cashless transactions among commercial banks. Financial literacy among the population, financial innovation and risk has influenced digital payments adoption. Mobile payment options such as mobile applications have increased the growth of cashless transactions. Progressive cashless transactions necessitate commercial banks to be more innovative in introducing new products such as mobile banking, mobile apps and credit and debit cards.

4.5 Factors Analysis

The study embraced a variable reduction approach to reduce the number of statements that do not meet the threshold in the dataset. According to Comrey and lee (2013), factor analysis is a term that represents a large number of different mathematical procedures for analyzing the interrelationships among a set of variables and for explaining these relationships in terms of a reduced number of variables called factors. In this case, factor analysis was conducted on all items for each study variable. Cooper and Schindler (2014) suggest that variables with a factor loading of less than 0.4 are unacceptable. Factor analysis was carried out to check for any correlated variables for redundancy in data to be reduced.

4.5.1 Factor Analysis for Perceived Risks

Factor analysis was conducted on the statements on perceived risks. This was done by subjecting the statement to dimension reduction in SPSS, where any sub variable with a value less than 0.4 was considered to be removed. The results are as shown in Table 4.9.

Table 4.9: Factor Analysis for Perceived Risks

Statements	Factor Loadings
Loss of money through fraud influences growth of cashless transactions within the bank	0.427
Fear of spreading contagious diseases influences the growth of cashless transactions within the bank	0.663
Importance of having a future reference for any transaction influences growth of cashless transactions	0.736
The risks of kidnapping and theft influences the growth of the cashless transactions	0.569
The risk of having fake money influences the growth of cashless transactions	0.499

Source: Field Data (2022)

According to Mabert, Soni and Venkataramanan (2003), statements with Eigen values greater than 0.4 should be extracted and below 0.4 should be dropped. Under perceived risks, the statements had Eigen values greater than 0.4; thus, none of the statements was adopted in the study.

4.5.2 Factor Analysis for Perceived Ease of Use

Factor analysis was conducted on the statements on perceived ease of use. This was done by subjecting the statement to dimension reduction in SPSS, where any sub variable with a value less than 0.4 was considered to be removed. The results are shown in Table 4.10.

Table 4.10: Factor Analysis for Perceived Ease of Use

Statements	Factor Loadings
The easiness to use online platforms influences the growth of cashless transactions	0.613
The easiness of conducting cashless transactions influences its growth	0.718
The easiness of understanding the online platforms and mobile banking influences the growth of cashless transactions	0.686
The flexibility in using the cashless transactions influences its growth	0.879
The simplicity of mobile applications and other internet banking influences its growth	0.755

Source: Field Data (2022)

Results in Table 4.10 show that all the statements on perceived ease of use had factor loading values (Eigenvalues) greater than 0.4 and therefore none of the sub-variables (statements) was dropped.

4.5.3 Factor Analysis for Financial Literacy

Factor analysis was conducted on the statements on financial literacy. This was done by subjecting the statement to dimension reduction in SPSS, where any sub variable with a value less than 0.4 was considered to be removed. The results are shown in Table 4.11.

Table 4.11: Factor Analysis for Financial Literacy

Statements	Factor Loadings
Cash management skills of the customers influences the growth of cashless transactions	0.777
Knowledge in making online transactions influences the growth of cashless transactions	0.841
Making sound financial choices influences the growth of cashless transactions	0.751
Basic knowledge of the customers influences the growth of cashless transactions	0.851
Literacy in mobile application and internet banking influences the growth of the cashless transactions	0.947

Source: Field Data (2022)

The outputs in Table 4.11 show that all the statements on financial literacy had factor loading values greater than 0.4 and therefore they were accepted and no sub variable (statement) was dropped.

4.5.4 Factor Analysis for Financial Innovation

Factor analysis was conducted on the statements on financial innovation. This was done by subjecting the statement to dimension reduction in SPSS, where any sub variable with a value less than 0.4 was considered to be removed. The results are shown in Table 4.12.

Table 4.12: Factor Analysis for Financial Innovation

Statements	Factor Loadings
Availability of mobile application influence the growth of cashless transactions	0.538
Availability of the credit cards influences the growth of cashless transactions	0.597
Innovation of mobile banking has increased the growth of cashless transactions	0.704
Availability of the debit cards influences the growth of cashless transactions	0.642
Internet banking influences the growth of cashless transactions	0.659

Source: Field Data (2022)

It was found that under variable financial innovation, all statements had eigen values of more than 0.4 and, therefore, all the statements were utilized for further analysis.

4.5.5 Factor Analysis for Regulatory Framework

Factor analysis was conducted on the statements on regulatory framework. This was done by subjecting the statement to dimension reduction in SPSS, where any sub variable with a value less than 0.4 was considered to be removed. The results are shown in Table 4.13.

Table 4.13: Factor Analysis for Regulatory Framework

Statements	Factor Loadings
Banking policies influences the growth of cashless transactions	0.863
Growth of cashless transactions has been influenced by the internet regulations	0.668
Financial regulations influence the growth of cashless transactions	0.631
Government requirements influence the growth of cashless transactions	0.710
Regulatory framework significantly influences the adoption of electronic payments	0.725

Source: Field Data (2022)

The study results presented in Table 4.13 indicates that all the eigenvalues under the variable regulatory framework were greater than 0.4. Hence, all the sub-variables (statements) were included in the study.

4.5.6 Factor Analysis for Growth of Cashless Transactions

Factor analysis was conducted on the statements on growth of cashless transactions. This was done by subjecting the statement to dimension reduction in SPSS, where any sub variable with a value less than 0.4 was considered to be removed. The results are shown in Table 4.14

Table 4.14: Factor Analysis for Growth of Cashless Transactions

Statements	Std. Deviation
The bank has reported an increase of online deposit in the last five years	0.679
The electronic funds transfer at the bank has been increasing in the last five years	0.475
The bank has reported an increase in online withdrawals in the last five years	0.658
ATM services have attracted more depositors for the bank.	0.749
The number of customers using mobile application has increased in the last five years	0.470

Source: Field Data (2022)

The study results presented in Table 4.14 show that Eigen values (factor loading values) under variable, growth of cashless transactions were greater than 0.4, thus all the statements were used in the study.

4.6 Inferential Analysis

The inferential analysis shows the relationship between the variables. This section presents both correlation and regression results.

4.6.1 Correlation Analysis

The correlation analysis shows the movement/association of the variables. The study used Pearson correlations to examine the association between the variables. The justification for embracing the Pearson correlation method was because it is the most common method to use for numerical variables; it assigns a value between -1 and 1, where 0 is no correlation, 1 is a total positive correlation, and -1 is a total negative correlation. It is used when there are quantitative variables. Hence, the study considered the Pearson correlation method as the most appropriate. The positive correlation indicates variables move in the same direction, while the negative correlation implies

the association among the variables moves in the opposite direction. There is no association when the correlation is zero. The study results of the correlation are summarized in Table 4.15

Table 4.15: Correlation Analysis

		Growth of Cashless Transactions	Perceived Risks	Perceived Ease of Use	Financial Literacy	Financial Innovation	Regulatory Framework
Growth of Cashless Transactions	Pearson Correlation	1.000					
	Sig. (2-tailed)						
Perceived Risks	Pearson Correlation	.608**	1.000				
	Sig. (2-tailed)	0.000					
Perceived Ease of Use	Pearson Correlation	.564**	.330**	1.000			
	Sig. (2-tailed)	0.000	0.000				
Financial Literacy	Pearson Correlation	.366**	.267**	.289**	1.000		
	Sig. (2-tailed)	0.000	0.000	0.000			
Financial Innovation	Pearson Correlation	.743**	.444**	.488**	.267**	1.000	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
Regulatory Framework	Pearson Correlation	.754**	.545**	.541**	.272**	.627**	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	

Source: Field Data (2022)

The study results of the correlation analysis in Table 4.15 indicate that a positive and significant association exists between perceived risks and the growth of cashless transactions ($r=.608$, $p=.000$). Also, a positive and significant association exists between perceived ease of use and growth of cashless transactions ($r=.564$, $p=.000$). Further, financial literacy is positively and significantly associated with the growth of cashless transactions ($r=.366$, $p=.000$). In addition, financial innovation is positively and significantly associated with the growth of cashless

transactions ($r=.743$, $p=000$). Finally, the regulatory framework is positively and significantly associated with the growth of cashless transactions ($r=.754$, $p=000$).

The study results are consistent with the findings of Baganz and Lau (2017) who found that the perceived risks such as the loss of money through fraud influence the use of mobile money payment systems. Makanyeza (2017) noted that perceived usefulness, perceived self-efficacy, influence from social groups, relative advantages and perceived compatibility positively affect the adoption of mobile money payment services. A study by Daniyan-Bagudu, Khan and Roslan (2017) indicated that perceived risks, agency banking and mobile banking services as fundamental in determining the growth of cashless transactions. Ugwueze and Nwezeaku (2016) revealed the growth of cashless transactions such as e-banking among the commercial banks in Nigeria is highly influenced by the regulatory framework. A study conducted by Mwayo (2017) showed that the regulatory framework significantly affects the adoption of electronic payments by commercial banks in Kenya.

4.6.2 Regression Analysis

Regression analysis is a set of statistical methods used to estimate relationships between perceived risks, perceived ease of use, financial literacy, financial innovation and growth of cashless transactions. The regression analysis includes the presentation of model fitness, variance analysis (ANOVA) and regression coefficients. The model fitness results are presented in Table 4.16

Table 4.16: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.832a	0.692	0.688	0.191757

a Predictors: (Constant), Perceived Risks, perceived ease of use, financial literacy, financial innovation

Source: Field Data (2022)

The results presented in Table 4.16 establish that perceived risks, perceived ease of use, financial literacy and financial innovation are satisfactory in influencing the growth of cashless transactions of commercial banks in Kenya. The coefficient of determination, also known as the R square, was 0.692 (69.2%). This implied that perceived risks, perceived ease of use, financial literacy and financial innovation could explain 69.2% of the variations in the growth of cashless transactions of commercial banks in Kenya. The study results are in agreement with the findings of Makanyeza (2017) who noted that perceived usefulness, perceived self-efficacy, influence from social groups, relative advantages and perceived compatibility positively affect the adoption of mobile money payment services. Daniyan-Bagudu, Khan and Roslan (2017) indicated that perceived risks, agency banking, and mobile banking services are fundamental in determining cashless transactions' growth. Further, Mushkudiani (2018) found some factors that determine the growth of cashless transactions, including financial innovation, strategic alternative banking channels and advances in the technology applied.

Moreover, the analysis of variance (ANOVA) was determined and the study results are presented in Table 4.17

Table 4.17: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.078	4	6.269	170.498	.000b
	Residual	11.178	304	0.037		
	Total	36.256	308			

a Dependent Variable: Growth of Cashless Transactions

b Predictors: (Constant), Perceived Risks, perceived ease of use, financial literacy, financial innovation

Source: Field Data (2022)

Based on the study results presented in Table 4.17, the p-value was found to be 0 .000, which is less than 0.05; thus, perceived risks, perceived ease of use, financial literacy and financial innovation are significant in explaining the growth cashless transactions. This implies that perceived risks, perceived ease of use, financial literacy and financial innovation are critical variables/factors that can influence the growth of cashless transactions. The study results are in agreement with the findings of Mushkudiani (2018) who found that some factors that determine the growth of cashless transactions include financial innovation, strategic alternative banking channels and advances in the technology applied. Liébana-Cabanillas, Leiva and Fernández (2017) revealed that the perceived risks are one of the factors that determine the adoption of mobile payment systems. Daniyan-Bagudu, Khan and Roslan (2017) indicated that perceived risks, agency banking, and mobile banking services are fundamental in determining cashless transactions' growth. In addition, Makanyeza (2017) noted that perceived usefulness, perceived self-efficacy, influence from social groups, relative advantages and perceived compatibility positively affect the adoption of mobile money payment services. Further, the result of regressions of the coefficients are presented in Table 4.18

Table 4.18: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.144	0.161		0.896	0.371
	Perceived Risks	0.306	0.037	0.300	8.248	0.000
	Perceived Ease of Use	0.172	0.032	0.199	5.318	0.000
	Financial Literacy	0.072	0.025	0.098	2.890	0.004
	Financial Innovation	0.469	0.038	0.487	12.471	0.000

a Dependent Variable: Growth of Cashless Transactions

Source: Field Data (2022)

The results can be summarized by the following model;

$$Y = 0.144 + 0.306X_1 + 0.172X_2 + 0.072X_3 + 0.469X_4$$

Where: -

Y= Growth of cashless transactions

X₁= Perceived Risks

X₂= Perceived Ease of Use

X₃= Financial Literacy

X₄= Financial Innovation

Table 4.18 shows that perceived risks is positively and significantly related to the growth of cashless transactions ($\beta=0.306$, $p=0.000$). The results imply that a unitary change in perceived risks leads to a growth of cashless transactions of commercial banks in Kenya by 0.306 units when other factors are held constant. It was found that perceived ease of use is positively and

significantly related to the growth of cashless transactions ($\beta=0.172$, $p=0.000$). This implied that a unitary change in perceived ease of use leads to a growth of cashless transactions of commercial banks in Kenya by 0.172 units when other factors are held constant.

In addition, the study found that financial literacy is positively and significantly related to the growth of cashless transactions ($\beta=0.072$, $p=0.004$). This implied that a unitary change in financial literacy leads to the growth of cashless transactions of commercial banks in Kenya by 0.072 units when other factors are held constant. Finally, the study found that financial innovation is positively and significantly related to the growth of cashless transactions ($\beta=0.469$, $p=0.000$). This indicated that a unitary change in financial innovation leads to the growth of cashless transactions of commercial banks in Kenya by 0.469 units when other factors are held constant.

The study results are in agreement with the findings of Liébana-Cabanillas, Leiva and Fernández (2017), who revealed that the perceived risks are one of the factors that determine the adoption of mobile payment systems. In addition, Makanyeza (2017) noted that perceived usefulness, perceived self-efficacy, influence from social groups, relative advantages and perceived compatibility positively affect the adoption of mobile money payment services. Amer, Ibrahim, Othman and Md Jani (2020) showed that perceived ease of use is salient in applying the cashless payment system. Further, Mushkudiani (2018) found some factors that determine the growth of cashless transactions, including financial innovation, strategic alternative banking channels and advances in the technology applied. Daniyan-Bagudu, Khan and Roslan (2017) indicated that perceived risks, agency banking, and mobile banking services are fundamental in determining cashless transactions' growth.

4.6.3 Controlling Effect Regulatory Framework

The study sought to examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya. The control effect model was built in two steps. In step one, the regulatory framework was used as a predictor variable. In step two, perceived risks, perceived ease of use, financial literacy and financial innovation, regulatory framework and interactions between regulatory framework and perceived risks, perceived ease of use, financial literacy and financial innovation were regressed against growth of cashless transactions. The coefficient of determination (R squared) for the two steps is presented below in Table 4.19

Table 4.19: Model Fitness for Controlling Effect Regulatory Framework

Model	R Square
1	0.741
2	0.795

Source: Field Data (2022)

The study results in Table 4.19 indicate that regressing perceived risks, perceived ease of use, financial literacy, financial innovation and regulatory framework against growth of cashless transactions had a coefficient of determination (R squared) of 0.741 (74.1%) in the first step. In step 2, regressing perceived risks, perceived ease of use, financial literacy, financial innovation and regulatory framework and the interaction term (perceived risks*regulatory framework, perceived ease of use*regulatory framework, financial literacy*regulatory framework, financial innovation*regulatory framework) against growth of cashless transactions had a coefficient of determination (R squared) of 0.795 (79.5%). The results show that R squared increased in the two models. The analysis of variance (ANOVA) was determined and the study results are presented in Table 4.20

Table 4.20: Analysis of Variance (ANOVA) for Controlling Effect Regulatory Framework

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.854	5	5.371	173.097	.000b
	Residual	9.402	303	0.031		
	Total	36.256	308			
2	Regression	28.829	9	3.203	128.953	.000b
	Residual	7.427	299	0.025		
	Total	36.256	308			

Source: Field Data (2022)

The ANOVA results presented in Table 4.20 show that all the two models were significant. The F-Statistic for model one was ($F=173.097$, $p = 0.000 < 0.05$), the F-Statistic for Model two was ($F=128.953$, $p = 0.000 < 0.05$). The F statistics was found to be positive and thus, the models were significant in determining the growth of cashless transactions among the commercial banks in Kenya. The result of the regressions of the coefficients are presented in Table 4.21

Table 4.21: Regression Coefficients for Controlling Effect Regulatory Framework

Mode		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1		B	Std. Error	Beta		
1	(Constant)	0.052	0.150		0.349	0.727
	Perceived risk	0.210	0.036	0.205	5.767	0.000
	Perceived ease of use	0.099	0.031	0.115	3.170	0.002
	Financial literacy	0.067	0.023	0.091	2.917	0.004
	Financial innovation	0.355	0.038	0.368	9.422	0.000
	Regulatory framework	0.325	0.043	0.324	7.567	0.000
2	(Constant)	1.744	0.253		6.891	0.000
	Perceived risk	0.129	0.040	0.127	3.207	0.001
	Perceived ease of use	0.045	0.035	0.053	1.298	0.195
	Financial literacy	0.024	0.025	0.033	0.986	0.325
	Financial innovation	0.294	0.035	0.305	8.331	0.000
	Regulatory framework	0.315	0.085	0.314	3.694	0.000
	Perceived Risks*regulatory framework	0.054	0.012	0.387	4.602	0.000
	Perceived Ease of Use*regulatory framework	0.022	0.009	0.153	2.386	0.018
	Financial Literacy*regulatory framework	0.056	0.009	0.382	5.916	0.000
	Financial Innovation*regulatory framework	0.008	0.004	0.062	1.773	0.001

Source: Field Data (2022)

In step one, the results can be summarized by the following model;

$$Y = 0.052 + 0.210X_1 + 0.099X_2 + 0.067X_3 + 0.355X_4 + 0.325M$$

Where: -

Y= Growth of cashless transactions

X₁= Perceived Risks

X₂= Perceived Ease of Use

X₃= Financial Literacy

X₄= Financial Innovation

M= Regulatory framework (controlling variable)

In step two, the results can be summarized by the following model;

$$Y = 1.744 + 0.129X_1 + 0.045X_2 + 0.024X_3 + 0.294X_4 + 0.315M + 0.054X_1M + 0.022X_2M + 0.056X_3M + 0.008X_4M$$

Where;

Y= Growth of cashless transactions

X₁= Perceived Risks

X₂= Perceived Ease of Use

X₃= Financial Literacy

X₄= Financial Innovation

M= Regulatory framework (controlling variable)

X₁M= Perceived Risks* Regulatory framework

X₂M= Perceived Ease of Use* Regulatory framework

X₃M= Financial Literacy* Regulatory framework

X₄M= Financial Innovation* Regulatory framework

It was found that the interaction of perceived risks with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.054$, $p=0.000$). Thus, a unit change of the interacted perceived risks and regulatory framework leads to a growth of cashless transactions of commercial banks in Kenya by 0.054 units when other factors are held constant. In addition, the study found that the interaction of perceived ease of use with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.022$, $p=0.018$). Hence, a unit change of the interacted perceived ease of use and regulatory framework leads to a growth of cashless transactions of commercial banks in Kenya by 0.022 units when other factors are held constant. Moreover, the study found that the interaction of financial literacy with

the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.056$, $p=0.000$). Thus, a unit change of the interacted financial literacy and regulatory framework leads to a growth of cashless transactions of commercial banks in Kenya by 0.056 units when other factors are held constant.

Similarly, it was found that the interaction of financial innovation with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.008$, $p=0.001$). Thus, unit change of the interacted financial innovation and regulatory framework leads to a growth of cashless transactions of commercial banks in Kenya by 0.008 units when other factors are held constant. The changing of the coefficients of the independent variables in the controlling analysis shows the changes in the strength or direction of an effect between the independent variable against the dependent variable. In other words, it shows the effects of the relationship between the independent variable or predictor variable and a dependent variable.

The study results show that the interaction of perceived risks, perceived ease of use, financial literacy and financial innovation with regulatory framework is positively significant. Hence regulatory framework has a controlling effect on the growth of cashless transactions of commercial banks in Kenya. Moreover, the R square changed from 74.1% to 79.5% when perceived risks, perceived ease of use, financial literacy and financial innovation interacted with the regulatory framework. The study results agree with the findings of Ugwueze and Nwezeaku (2016), which indicated that the regulatory framework significantly affects the growth of cashless transactions. Moreover, Mbwayo (2017) showed that the regulatory framework significantly influences the adoption of electronic payments by commercial banks in Kenya. Further, Vutsengwa and Ngugi (2013) found that regulation is one of the factors affecting the growth of electronic payments in the Kenya banking industry.

4.7 Chapter Summary

The chapter has included discussions of the response rate, demographic information, reliability and validity analysis, descriptive analysis and inferential analysis. The average response rate was 94.21%. In addition, none of the response rates from either manager from the human resource department, finance department, marketing department, or ICT Department was less than 85%. The study has indicated that mobile money has been highly attributed to the evolution of digital currency in Kenya. The Central Bank of Kenya proposes introducing a digital currency in the country in a move that could ease cross-border payments and complement mobile money in the local market. The proposed Central Bank Digital Currency (CBDC) is a virtual version of the shilling, exchangeable one-to-one with physical cash. Commercial banks have adopted cashless transactions due to technological advancements and high innovation.

The study has shown that perceived risks, perceived ease of use, financial literacy and financial innovation are some of the factors influencing the growth of cashless transactions in commercial banks in Kenya. Perceived risks, perceived ease of use, financial literacy and financial innovation explain 69.2% of the variations in the growth of cashless transactions of commercial banks in Kenya. The perceived risks, perceived ease of use, financial literacy and financial innovation are positively and significantly related to the growth of cashless transactions. The regulatory framework has a controlling effect on the growth of cashless transactions of commercial banks in Kenya. The interaction of perceived risks, perceived ease of use, financial literacy and financial innovation with the regulatory framework is positively and significantly related to the growth of cashless transactions.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter includes a discussion of the findings, conclusion and recommendations. Each of the sections is examined based on the research findings. The study particularly sought to determine factors influencing the growth of cashless transactions of commercial banks in Kenya.

5.2 Discussion of the Findings

The study adopted the explanatory research design. The sample size was 328 and an average response rate of 94.21% was obtained in the study. The Cronbach's alpha coefficients for perceived risks, perceived ease of use, financial literacy, financial innovation, regulatory framework and growth of cashless transactions were above 0.7, indicating that they are reliable. The discussion of the findings are presented based on the research objectives.

5.2.1 Evolution of Digital Currency in Kenya

The first objective of the study was to evaluate the extent of evolution of the digital currency in Kenya. The study found that the Central Bank of Kenya proposes introducing a digital currency in the country in a move that could ease cross-border payments and complement mobile money in the local market. The proposed Central Bank Digital Currency (CBDC) is a virtual version of the shilling, exchangeable one-to-one with physical cash. The study noted that CBDCs would usher in a new era of money if successful.

Moreover, it was established that mobile money has been highly attributed to the evolution of digital currency in Kenya. Mobile money in Kenya helps make financial transactions across long-distance with mobile phones, reducing travel costs and eliminating the risks of carrying cash, and avoiding most high bank charges. Further, the growth of cashless transactions is highly attributed

to the outbreak of the Covid 19 pandemic. The risks associated with using cash amid the Covid 19 pandemic are stimulating the high adoption of cashless transactions.

It was established that the type of digital currency includes cryptocurrency, virtual currency and central bank digital currency. Commercial banks have adopted cashless transactions due to technological advancements and high innovation. The growth of cashless transactions has been influenced by internet banking, mobile banking, ease of conducting transactions, financial literacy in online transactions and safety associated with digital transactions, such as privacy. Customers prefer cashless transactions due to their efficiency and flexibility. The growth of cashless transactions includes mobile applications, automatic teller machines, mobile banking and banking cards.

The study results are consistent with Choto's (2018) findings, which found that technology, financial trends and legal frameworks significantly impact the adoption of virtual currency in organizations. Akintaro (2019) asserts that mobile money in Kenya is helping low-income communities make financial transactions across long-distance with their mobile phones, reducing travel costs, eliminating the risks of carrying cash, and avoiding most high bank charges. Moreover, another study conducted by Kotkowski and Polasik (2021) showed that the Covid-19 pandemic had accelerated cashless transactions. Pal, Chandra, Kameswaran, Parameshwar, Joshi, and Johri (2018) indicates the evolution of cashless transactions has led to banking cards, mobile banking, national electronic funds transfer, automatic teller machines and mobile applications.

5.2.2 Factors Influencing Growth of Cashless Transactions

The second objective of the study was to establish factors influencing growth of cashless transactions of commercial banks in Kenya. It was revealed that perceived risks, perceived ease of use, financial literacy and financial innovation are satisfactory in influencing the growth of

cashless transactions in commercial banks in Kenya. The study showed that perceived risks, perceived ease of use, financial literacy and financial innovation could explain 69.2% of the variations in the growth of cashless transactions of commercial banks in Kenya. The correlation results showed that perceived, perceived ease of use, financial literacy and financial innovation are positively and significantly associated with the growth of cashless transactions.

The regression results indicated that perceived risks is positively and significantly related to the growth of cashless transactions ($\beta=0.306$, $p=0.000$). Thus, a unitary change in perceived risks leads to a growth of cashless transactions of commercial banks in Kenya by 0.306 units when other factors are held constant. The study results agree with the findings of Baganzi and Lau (2017), which found that perceived risks such as the loss of money through fraud influence the use of mobile money payment systems. Kipng'etich, Chepkilot, and Koima (2018) reported that one factor influencing the growth of cashless transactions includes technology and strategies adopted. Liébana-Cabanillas, Leiva and Fernández (2017) revealed that perceived risks are one of the factors that determine the adoption of mobile payment systems. Teka (2020) revealed that perceived usefulness, perceived ease of use, attitude towards e-banking, perceived behavioral control, subjective norms, behavioral intention, awareness, and the availability of internet/network connection have a significant positive impact on users' e-banking usage practice.

It was found that perceived ease of use is positively and significantly related to the growth of cashless transactions ($\beta=0.172$, $p=0.000$). This implied that a unitary change in perceived ease of use leads to a growth of cashless transactions of commercial banks in Kenya by 0.172 units when other factors are held constant. The study by Makanyeza (2017) indicated that perceived usefulness, perceived self-efficacy, influence from social groups, relative advantages and perceived compatibility positively affected the adoption of mobile money payment services.

Achieng and Ingari (2015) indicated that perceived ease of use of mobile banking affects mobile banking adoption. Amer, Ibrahim, Othman and Md Jani (2020) indicated that the perceived ease of use, perceived usefulness and perceived risk are significant factors in adopting the cashless payment system. Rono (2014) revealed that perceived ease of use, perceived usefulness and behavioral intention to use are positively related to acceptance of mobile money services.

In addition, the study found that financial literacy is positively and significantly related to the growth of cashless transactions ($\beta=0.072$, $p=0.004$). This implied that a unitary change in financial literacy leads to the growth of cashless transactions of commercial banks in Kenya by 0.072 units when other factors are held constant. The study by Mushkudiani (2018) indicated some factors that determine the growth of cashless transactions include financial innovation, strategic alternative banking channels and advances in the technology applied. Daniyan-Bagudu, Khan and Roslan (2017) indicated that perceived risks, agency banking and mobile banking services as fundamental in determining the growth of cashless transactions. Wachira and Kihui (2017) indicate that households' access to financial services is based on levels of financial literacy, such as cash management skills and making sound financial choices.

Finally, the study found that financial innovation is positively and significantly related to the growth of cashless transactions ($\beta=0.469$, $p=0.000$). This indicated that a unitary change in financial innovation leads to the growth of cashless transactions of commercial banks in Kenya by 0.469 units when other factors are held constant. The study results are consistent with the findings of Kamau and Oluoch (2016) and Muchiri (2017), which indicated the growth of cashless transactions is determined by financial innovation, online banking and technological advancement. Financial innovation entails creating new financial products, services, or processes to enhance efficiency. Financial innovative products are vital forces for diversification and increasing online

transactions. Mobile applications, credit cards, debit cards and internet banking are potent in influencing the growth of cashless transactions. Mwangi, Kuria and Atheru (2018) showed that a positive and significant relationship existed between process innovation, product innovation, institutional innovation and performance. Factors associated with perceived risk such as privacy, financial, psychological, physical, trust, social risk and future references for transactions influence the growth of cashless transactions.

5.2.2 Controlling Effect of Regulatory Framework

The third objective of the study was to examine the controlling effect regulatory framework on the growth of cashless transactions of commercial banks in Kenya. The correlation results showed that the regulatory framework is positively and significantly associated with the growth of cashless transactions. It was found that the interaction of perceived risks with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.054$, $p=0.000$). In addition, the study found that the interaction of perceived ease of use with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.022$, $p=0.018$). Moreover, the study found that the interaction of financial literacy with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.056$, $p=0.000$).

Similarly, it was found that the interaction of financial innovation with the regulatory framework is positively and significantly related to the growth of cashless transactions ($\beta=0.008$, $p=0.001$). The changing of the coefficients of the independent variables in the controlling analysis shows the changes in the strength or direction of an effect between the independent variable against the dependent variable. In other words, it shows the effects of the relationship between the independent variable or predictor variable and a dependent variable. The R square changed from 74.1% to

79.5% when perceived risks, perceived ease of use, financial literacy and financial innovation interacted with the regulatory framework. Hence regulatory framework has a controlling effect on the growth of cashless transactions of commercial banks in Kenya.

The government enacts regulations that facilitate the adoption of internet banking in commercial banks. In the absence of an effective regulatory framework, many commercial banks may fail to employ effective customer protection systems such as security systems. The lack of an effective regulatory framework for monitoring the application of internet banking operations in commercial banks hinders the government from guiding the commercial banks on how to implement internet banking effectively. The regulations ensure the technologies used in e-money must be secure and ensure robust operations. The study results agree with the findings of Vutsengwa and Ngugi (2013) who found that regulation is one of the factors affecting the growth of electronic payments in the Kenya banking industry. Ugwueze and Nwezeaku (2016) indicated that the regulatory framework significantly affects the growth of cashless transactions. Moreover, Mbwayo (2017) showed that the regulatory framework significantly influences the adoption of electronic payments by commercial banks in Kenya.

5.3 Conclusions

The first objective of the study was to evaluate the extent of the evolution of the digital currency in Kenya. Based on the study findings, it is concluded that mobile money has been highly attributed to the evolution of digital currency in Kenya. The Central Bank of Kenya proposes introducing a digital currency in the country in a move that could ease cross-border payments and complement mobile money in the local market. The proposed Central Bank Digital Currency (CBDC) is a virtual version of the shilling, exchangeable one-to-one with physical cash. The study noted that CBDCs would usher in a new era of money if successful. Mobile money in Kenya helps make

financial transactions across long-distance with mobile phones, reducing travel costs and eliminating the risks of carrying cash, and avoiding most high bank charges. Further, the growth of cashless transactions is highly attributed to the outbreak of the Covid 19 pandemic. Commercial banks have adopted cashless transactions due to technological advancements and high innovation

The second objective of the study was to establish factors influencing the growth of cashless transactions in commercial banks in Kenya. Based on the findings of the study, it is concluded that perceived risks, perceived ease of use, financial literacy and financial innovation are some of the factors influencing the growth of cashless transactions in commercial banks in Kenya. The study indicated that perceived risks, perceived ease of use, financial literacy and financial innovation explain 69.2% of the variations in the growth of cashless transactions of commercial banks in Kenya. The perceived risks, perceived ease of use, financial literacy and financial innovation are positively and significantly associated with the growth of cashless transactions.

The regression results indicated that a unitary change in perceived risks would lead to a growth of cashless transactions of commercial banks in Kenya by 0.306 units when other factors are held constant. The factors associated with perceived risk such as privacy, financial, psychological, physical, trust, social risk and future references for transactions influence the growth of cashless transactions. Moreover, time-loss risk and security are the most dominant risks influencing consumer involvement with electronic payments. The provision of a method of confirming the identity of the business one has registered on the system reduces the possibility of losing money, thus spurring cashless transactions.

The study further showed that perceived ease of use is positively and significantly related to the growth of cashless transactions and a unitary change in perceived ease of use leads to a growth of cashless transactions of commercial banks in Kenya by 0.172 units when other factors are held

constant. The perceived ease of use, usefulness and risk are significant factors in adopting the cashless payment system. The perceived usefulness highly influences the behavioral intention to use mobile money services; that is, if people perceive technology as useful, their behavioral intention to use it increases.

In addition, the study found that financial literacy is positively and significantly related to the growth of cashless transactions. A unitary change in financial literacy leads to the growth of cashless transactions of commercial banks in Kenya by 0.072 units when other factors are held constant. The literacy in mobile banking, internet connectivity and agency banking positively spur the growth of cashless transactions. The customers' cash management skills and knowledge in making online transactions have promoted the development of cashless transactions. The households' access to financial services is based on levels of financial literacy such as cash management skills and making sound financial choices.

The study revealed that financial innovation is positively and significantly related to the growth of cashless transactions and a unitary change in financial innovation leads to the growth of cashless transactions of commercial banks in Kenya by 0.469 units when other factors are held constant. The financial innovation of ATMs Cards, internet and mobile banking, and funds transfer systems such as RTGS and EFT have enhanced the growth of cashless transactions. Financial innovation entails creating new financial products, services, or processes to improve efficiency. Financial innovative products are vital forces for diversification and increasing online transactions.

The third objective of the study was to examine the controlling effect regulatory framework on the growth of cashless transactions in commercial banks in Kenya. Based on the findings, it is concluded that the regulatory framework is positively and significantly associated with the growth of cashless transactions. The interaction of perceived risks with the regulatory framework is

positively and significantly related to the growth of cashless transactions. In addition, the interaction of perceived ease of use with the regulatory framework is positively and significantly related to the growth of cashless transactions. Moreover, the interaction of financial literacy with the regulatory framework is positively and significantly related to the growth of cashless transactions.

Similarly, the interaction of financial innovation with the regulatory framework is positively and significantly related to the growth of cashless transactions. Hence regulatory framework has a controlling effect on the growth of cashless transactions of commercial banks in Kenya. The regulations ensure the technologies used in e-money must be secure and ensure robust operations. The government enacts regulations that facilitate the adoption of internet banking in commercial banks. The lack of an effective regulatory framework for monitoring the application of internet banking operations in commercial banks hinders the government from guiding the commercial banks on how to implement internet banking effectively.

5.4 Recommendations

The recommendations of the study are illustrated based on policy recommendations, managerial recommendations and recommendations for areas of further research.

5.4.1 Policy Recommendations

The government should develop a regulatory framework with guidelines on how commercial banks should implement internet banking. In addition, there should be government policies that support the installation of better ICT infrastructure like fiber optic cable, reduced internet costs, enhanced better internet service accessibility, and enhance the existence of better internet security in the ICT infrastructure. There should be regulations that ensure the technologies used in e-money

are secure. The study recommends that the Central Bank of Kenya emphasize digital currency to ease cross-border payments and complement mobile money in the local market. The proposed Central Bank Digital Currency (CBDC) should be spearheaded to become applicable.

Based on the study's findings, it was found that the regulatory framework is positively and significantly related to performance. Hence, it is recommended that quality education, quality assurance, learning environment, quality of learning facilities and academic freedom should be emphasized by the regulatory bodies such as the commission of university education. Further, it is recommended that the commission of university education be directly involved in the quality improvement of the university programs. The universities must the requirements and standards of academic excellence set by the commission of university education.

5.4.2 Managerial Recommendations

Based on the study's findings, it is recommended that commercial banks in Kenya create awareness among their customers concerning the usage and benefits of e-banking service delivery channels. The banks need to ensure the factors associated with perceived risk, such as privacy, are enriched. The banks should also provide the provision a method or system that displays the details during the transaction process to reduce the possibility of losing money. In addition, the banks need to ensure the personal data remains very confidential and systems should be developed that minimize the chance of personal hacking information.

The study recommends that online platforms such as mobile application should not be complicated and has to be simple for use, understanding and doing transactions. The banks should enhance network infrastructure to avoid transaction delays. With delayed transactions, the user may have perceptions that can affect the whole process. The online platforms of the banks need to be highly secured, which could increase the customers' trust. The study recommended that system designers

and developers should endeavor to achieve user-friendliness in a technological system to improve the end users' perceived ease of use of the system. The perceived usefulness highly influences the behavioral intention to use mobile money services. If people perceive technology as useful, their behavioral intention to use it increases.

It is recommended that banks create awareness of the customers on cash management skills, making online transactions and making sound financial choices. The banks should increase mass education/enlightenment on finance management so that people can achieve the most from the latest development in the cashless system. The study recommended the development of a curriculum on financial education and administering it in local, middle level and higher learning institutions. In addition, it is recommended that banks should strive to educate the account holders on the benefits that they would incur from taking up the online services.

The bank also needs to offer the best services to the current users to encourage those not using it. There is a need for continuous information provision on how cashless transactions work. Banks should continuously educate their customers on the availability of the innovation and measures that may already be in place to mitigate risk associated with the use of the innovation. The stakeholders in commercial banks should take any investments made toward technology-based financial innovation products as a strategy to improve cashless transactions. The study recommended that commercial banks do much to enhance their mobile banking services to enhance their performance. Moreover, the banks should embrace the promoting the product innovations, process innovations and marketing innovations to improve the cashless transactions. Moreover, there should be a regulatory framework to guide online transactions.

5.4.3 Recommendations for Areas of Further Research

The study only focused on establishing factors influencing the growth of cashless transactions of commercial banks in Kenya. Thus, another study is recommended in other financial sectors, such as microfinance institutions. Moreover, future researchers could also introduce controlling variables other than regulatory frameworks, such as ownership structure and firm characteristics. The conducting of the study in different sectors other than commercial banks may have resulted in differing results.

5.5 Limitations of the Study

The researcher encountered some challenges during the time of data collection and they are worthy to be noted. First, managers were very committed within the day. The filling of the questionnaires took four weeks and not two weeks as earlier anticipated. This led to the adjustment of the budget and time frame. In addition, some of the managers were reluctant to give some of the information that they considered sensitive and could be disclosed to the competitors. To overcome the limitation of the low response rate or bias, the researcher explained to the respondents the relevance of the study and that it is for academics only. An authorization letter from NACOSTI and University graduate school was availed to them to enhance their confidentiality. In addition, the managers were not comfortable filling out the printed questionnaires due to COVID 19 aspects. To overcome the challenge of low response rate due to COVID 19 factors, the researcher used google form surveys in most cases. Besides, the study did not examine whether bank size and ownership structure of banks can influence the extent of the growth of cashless transactions and this became a limitation to the study.

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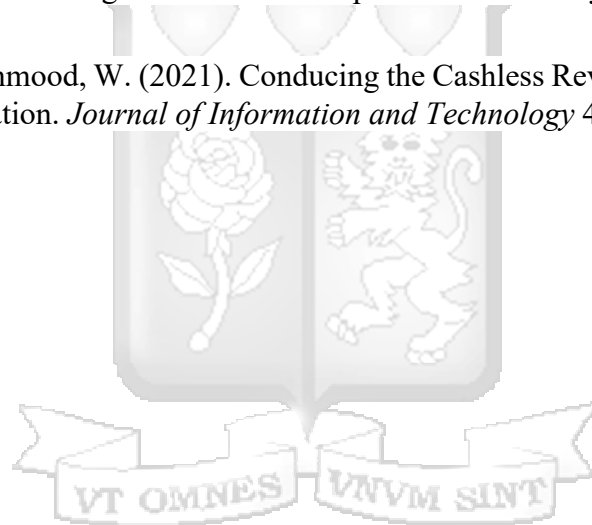
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Appendix I: Introduction Letter

Dear Sir/Madam,

I am conducting a study titled; “Influence of Regulatory Framework on the Relationship between Factors Influencing Cashless Transactions and Growth of Cashless Transactions”. This letter, therefore, is meant to invite you to contribute to this research by providing the necessary information required to meet the research objectives. Thank you.

Yours Sincerely,

Ernest Kirui



Appendix II: Questionnaire

The questionnaire below has been constructed to examine growth of cashless transactions in commercial banks in Kenya. The data collected will be strictly used for academic purposes only.

Section A: Demographic Information

1. Gender
 - a. Male ☐
 - b. Female ☐
2. Age bracket
 - a. 30 years and below ☐
 - b. 31-40 years ☐
 - c. 41-50 years ☐
 - d. Over 50 years ☐
3. Highest academic attainment
 - a. Diploma ☐
 - b. Bachelor's degree ☐
 - c. Master's degree ☐
 - d. PhD ☐
4. Period of worked in the bank
 - a. Less than a year ☐
 - b. 1 to 3years ☐
 - c. 4 to 6 years ☐
 - d. Above 6 years ☐
5. Department working in the bank
 - a) Human resource department ☐
 - b) finance department ☐
 - c) marketing department ☐
 - d) ICT department ☐
6. Please explain the extent of evolution of the digital currency in Kenya.

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SECTION B: PERCEIVED RISKS

Using the following scale, 1= **Strongly Disagree (SD)**, 2=**Disagree (D)**, 3=**Neutral (N)**, 4=**Agree (A)** and 5=**Strongly Agree (SA)**, kindly indicate your level of agreement with following statements relating to perceived risks.

Statement	SD	D	N	A	SA
1. Loss of money through fraud influences growth of cashless transactions within the bank					
2. Fear of spreading contagious diseases influences the growth of cashless transactions within the bank					
3. Importance of having a future reference for any transaction influences growth of cashless transactions					
4. The risks of kidnapping and theft influences the growth of the cashless transactions					
5. The risk of having fake money influences the growth of cashless transactions					

6. How else does perceived risks influences the growth of cashless transactions? Kindly explain

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SECTION C: PERCEIVED EASE OF USE

Using the following scale, 1= **Strongly Disagree (SD)**, 2=**Disagree (D)**, 3=**Neutral (N)**, 4=**Agree (A)** and 5=**Strongly Agree (SA)**, kindly indicate your level of agreement with following statements relating to perceived ease of use.

Statement	SD	D	N	A	SA
1. The easiness to use online platforms influences the growth of cashless transactions					
2. The easiness of conducting cashless transactions influences its growth					
3. The easiness of understanding the online platforms and mobile banking influences the growth of cashless transactions					
4. The flexibility in using the cashless transactions influences its growth					
5. The simplicity of mobile applications and other internet banking influences its growth					

6. Kindly explain how else does perceived ease of use influences the growth of cashless transactions?

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SECTION D: FINANCIAL LITERACY

Using the following scale, 1= **Strongly Disagree (SD)**, 2=**Disagree (D)**, 3=**Neutral (N)**, 4=**Agree (A)** and 5=**Strongly Agree (SA)**, kindly indicate your level of agreement with following statements relating to financial literacy

Statement	SD	D	N	A	SA
1. Cash management skills of the customers influences the growth of cashless transactions					
2. Knowledge in making online transactions influences the growth of cashless transactions					
3. Making sound financial choices influences the growth of cashless transactions					
4. Basic knowledge of the customers influences the growth of cashless transactions					
5. Literacy in mobile application and internet banking influences the growth of the cashless transactions					

6. Please illustrate how else does financial literacy influences the growth of cashless transactions?

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SECTION E: FINANCIAL INNOVATION

Using the following scale, 1= **Strongly Disagree (SD)**, 2=**Disagree (D)**, 3=**Neutral (N)**, 4=**Agree (A)** and 5=**Strongly Agree (SA)**, kindly indicate your level of agreement with following statements relating to financial innovation

Statement	SD	D	N	A	SA
1. Availability of mobile application influence the growth of cashless transactions					
2. Availability of the credit cards influences the growth of cashless transactions					
3. Innovation of mobile banking has increased the growth of cashless transactions					
4. Availability of the debit cards influences the growth of cashless transactions					
5. Internet banking influences the growth of cashless transactions					

6. How else does financial innovation influences the growth of cashless transactions? Please explain

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SECTION F: REGULATORY FRAMEWORK

Using the following scale, 1= **Strongly Disagree (SD)**, 2=**Disagree (D)**, 3=**Neutral (N)**, 4=**Agree (A)** and 5=**Strongly Agree (SA)**, kindly indicate your level of agreement with following statements relating to regulatory framework

Statement	SD	D	N	A	SA
1. Banking policies influences the growth of cashless transactions					
2. Growth of cashless transactions has been influenced by the internet regulations					
3. Financial regulations influence the growth of cashless transactions					
4. Government requirements influence the growth of cashless transactions					
5. Regulatory framework significantly influences the adoption of electronic payments					

6. Kindly explain how else does regulatory framework influence the growth of cashless transactions?

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SECTION G: GROWTH OF CASHLESS TRANSACTIONS

Using the following scale, 1= **Strongly Disagree (SD)**, 2=**Disagree (D)**, 3=**Neutral (N)**, 4=**Agree (A)** and 5=**Strongly Agree (SA)**, kindly indicate your level of agreement with following statements relating to growth of cashless transactions

Statement	SD	D	N	A	SA
1. The bank has reported an increase of online deposit in the last five years					
2. The electronic funds transfer at the bank has been increasing in the last five years					
3. The bank has reported an increase in online withdrawals in the last five years					
4. ATM services have attracted more depositors for the bank.					
5. The number of customers using mobile application has increased in the last five years					

6. How can you explain the growth of cashless transactions? Please elaborate

.....

.....

Appendix III: List of Commercial Banks in Kenya

1. African Banking Corp. Ltd.	2. Imperial Bank Ltd.
3. Bank of Africa Kenya Ltd.	4. I & M Bank Ltd.
5. Bank of India	6. Jamii Bora Bank Ltd.
7. Bank of Baroda (K) Ltd.	8. Kenya Commercial Bank Ltd.
9. Barclays Bank of Kenya Ltd.	10. Mayfair Bank Limited
11. Charterhouse Bank Limited	12. Middle East Bank (K) Ltd.
13. Chase Bank (K) Ltd.	14. National Bank of Kenya Ltd.
15. Citibank N.A.	16. NCBA Bank Kenya PLC
17. Consolidated Bank of Kenya Ltd.	18. M-Oriental Bank Ltd.
19. Co-operative Bank of Kenya Ltd.	20. Paramount Universal Bank Ltd
21. Credit Bank Ltd.	22. Prime Bank Ltd.
23. Development Bank (K) Ltd.	24. Postbank
25. Diamond Trust Bank (K) Ltd.	26. SBM Bank Kenya Limited
27. Dubai Bank Ltd.	28. Sidian Bank Limited
29. Ecobank Limited	30. Standard Chartered Bank (K) Ltd.
31. Equity Bank Ltd.	32. Spire Bank Ltd
33. Family Bank Ltd.	34. Stanbic Bank Kenya Limited
35. First Community Bank Ltd.	36. Transnational Bank Ltd.
37. Guardian Bank Ltd.	38. UBA Kenya Bank Limited
39. Gulf African Bank Ltd.	40. Victoria Commercial Bank Limited
41. Habib Bank A.G. Zurich	

Source: CBK (2020)

Appendix IV: Research Gap Matrix

Author	Focus	Findings	Gaps	Addressing the Gaps
Baganzi and Lau (2017)	Influence of perceived risks on the adoption and use of mobile money payment systems	Perceived risk is significantly and positively related to the adoption of mobile money payment systems in Uganda.	The study only focused on the influence of perceived risk on mobile money payment systems, thus conceptual gap is depicted.	The study examined the influence of perceived risks, perceived ease of use, financial literacy, financial innovation and regulatory framework on growth of cashless transactions
Uzonwanne and Ezenekwe (2017)	Effect of financial literacy on cashless policy system in Nigeria.	The impact of financial literacy on the cashless policy system is significant	The study used the descriptive research design, thus methodological gap	The study adopted the explanatory research design.
Mwangi, Kuria and Atheru (2018)	Influence of financial innovation on the Performance of Microfinance Banks in Nairobi City County, Kenya	Financial innovation has positive effect on performance	The study was done within microfinance institutions, thus contextual gap	The study was conducted in commercial banks
Liébana-Cabanillas, Leiva and Fernández (2017)	Factors that determine the adoption of mobile payment systems in Spain	Perceived risks determine the adoption of mobile payment systems.	The study focused on mobile payment systems only, thus conceptual gap.	The study focused on growth of cashless transactions
Baariu (2015)	Factors influencing adoption of mobile payments services in Embu town	M-Pesa enhances the adoption of mobile payments	The study only focused on Mpesa	The study focused on growth of cashless transactions among the commercial banks.

Amer, Ibrahim, Othman and Md Jani (2020)	Influence the adoption of a cashless payment system among SMEs in the services sector in Malaysia	Perceived ease of use, perceived usefulness and perceived risk determines the adoption of the cashless payment system	The study was conducted within the SMEs, thus contextual gap.	The study was conducted within the commercial banks
Liu and Tai (2016)	Factors affecting the intention to use mobile payment service plans in Vietnam.	Predictors of the intention to use M-payment are perceived ease of use and perceived usefulness	The study was conducted in Vietnam	The study was conducted in Kenya
Rono (2014)	Relationship between perceived ease of use, perceived usefulness, behavioral intention to use and acceptance of mobile banking services	Relationship between perceived ease of use, perceived usefulness, behavioral intention to use and acceptance of mobile banking services is positive	Descriptive research design was used, thus methodological gap	The study used explanatory research design.
Mwangi, Omwono, Tuggar, Mbuthia, Kinyua and Omenge (2018)	Effect of financial literacy on the performance of microfinance banks in Nairobi County	Financial literacy has a positive effect on performance	The study was conducted in microfinance banks, thus contextual gap.	The study was conducted in commercial banks
Kariu (2017)	Effect of financial literacy on the financial efficiency of	Financial literacy has positive effect	The study adopted a descriptive research design,	The study used explanatory research design.

	commercial banks in Kenya	on financial efficiency	thus methodological gap	
Matayo (2016)	Effect of innovation management on the growth of microfinance banks in Nairobi	Innovation management has a positive effect on growth	The study was done in microfinance banks, thus contextual gap.	The study was conducted in commercial banks
Wachira and Kihiu (2017)	Impact of financial literacy on access to financial services in Kenya	Access to financial services is based on levels of financial literacy	The study only focused on access to financial services, thus conceptual gap.	The study examined the influence of perceived risks, perceived ease of use, financial literacy, financial innovation and regulatory framework on growth of cashless transactions
Mbwayo (2017)	Factors influencing the adoption of electronic payments by commercial banks in Kenya	Regulatory framework significantly influences the adoption of electronic payments	The study adopted the descriptive research design, thus methodological gap	The study used explanatory research design.
Githii and Mwangi (2018)	Effect of technology-based financial innovations on non-interest income of commercial banks in Kenya	Technology based financial innovation has significant effect on the non-interest income earned	The study was focused on non-interest income earned, thus conceptual gap.	The study focused on growth of cashless transactions
Maina and Mungai (2019)	Effect of mobile banking services on the financial performance of tier one commercial banks in Kenya	Mobile banking funds transfer has a positive and significant effect on performance	The study employed descriptive research design, thus methodological gap	The study used explanatory research design.

Kojo and Yazidu (2015)	Effect of product innovations on the performance of microfinance institutions in Ghana.	Product innovations has a positive effect on performance	The study was done within microfinance institutions, thus contextual gap.	The study was conducted in commercial banks
Cherotich, Sang, Mutungú and Shisia (2015)	Effect of financial innovations on the performance of commercial banks in Kenya	A weak relationship between financial innovations and financial performance exists	The study utilized the descriptive research design, thus methodological gap.	The study used explanatory research design.
Mutangili, Awuor and Cheluget (2020)	Controlling effect of the regulatory framework in the relationship between international procurement practices and supply chain performance of energy development agencies in Kenya	There is a significant controlling effect of the regulatory framework in the relationship between international procurement practices and supply chain performance	The study was conducted within energy development agencies, thus contextual gap.	The study was conducted within commercial banks
Shamraev (2019)	Influence of Legal and regulatory framework on the payment and e-money services in Brazil, Russia, India, China and South Africa	Legal and regulatory framework has an influence on the payment and e-money services	The study adopted the descriptive research design, thus methodological gap	The study used explanatory research design

Source: Empirical Review Literature

Appendix V: National Commission for Science, Technology and Innovation (NACOSTI)

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Appendix VI: Institutional Ethics Board Approval



14th July 2022

Mr Kirui Ernest,
cheruiyot.kirui@strathmore.edu

Dear Mr Kirui,

RE: Regulatory Framework & Growth of Cashless Transactions in Commercial Banks in Kenya

This is to inform you that SU-ISERC has reviewed and approved your above SU Masters' research proposal. Your application reference number is SU-ISERC1404/22. The approval period is 14th July 2022 to 13th July 2023.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 48 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-ISERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and obtain other clearances needed.

Yours sincerely,

for: Dr Ben Ngoye,
Secretary, SU-ISERC

Cc: Prof Fred Were,
Chairperson, SU-ISERC

