THE EFFECT OF FINANCIAL INNOVATION ON ECONOMIC GROWTH IN KENYA

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DECLARATION

This research project is my original work and has not been submitted to any institution or university for examination.

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This research project has been presented for examination with my approval as university supervisor

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DEDICATION

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ABSTRACT

Over three billion people in developing countries are still without effective access to financial services. The problem is particularly acute in Sub-Saharan Africa and Kenya falls in this category, where about twenty-five percent of households have a formal relationship with a financial institution. Lack of access to financial services is therefore one of the largest constraints to private sector development in Africa and Kenya in particular. In responding to these changes, the Kenyan market in has recently witnessed a host of changes in the financial sector as a result of changes in the legal, regulatory, institutional framework. Fast changing technology has also greatly influenced access to financial services and increased channels through which financial services are provided. The objective of the research was to examine empirically the link between financial innovations and economic growth by assessing the effect of increasing financial innovations in Kenya on financial sector development, the extent to which changes in regulation and increasing rollout of new products such as mobile money payment systems, mobile banking and RTGS affect the economic growth and prosperity in Kenya. The study used secondary data from Central bank of Kenya, Kenya Bureau of Statistics and other institution. The data collected was analysed using regression method with the help of SPSS edited for accuracy, uniformity, consistency, completeness and arranged to enable and tabulated and the analysis presented in tables. The study concluded that financial innovation has an insignificant positive impact on economic growth with mobile transactions with greater impact. RTGS innovations and mobile banking have insignificant effects on financial deepening in Kenya. This means that the rise in mobile money transactions as well as in m-banking in Kenya have significantly influence economic growth. The study recommends that for financial innovation in Kenya to be enhanced, there is need for policy makers to relook at the approach of mobile money penetration in impacting use of formal financial services as this is seen to have an insignificant impact on economic growth.

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ABBREVIATIONS

ATM	–	Automated Teller Machine
ANBERD	–	Analytical Business Enterprise Research and Development database
GNP	–	Gross Domestic Product
NGO	–	Non Governmental Organization
OECD	–	Organization for Economic Co-Operation and Development
OID	–	Original Issue Deep Discount
KIPPRA	–	Kenya Institute of Public Policy for Research and Analysis
R&D	–	Research and Development
RTGS	–	Real Time Gross Service
SPSS	–	Statistical Package for Social Science
US	–	United States
WB	–	World Bank
WWF	–	World Wildlife Fund

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Financial innovation has been both praised as the engine of growth of society and castigated for being the source of the weakness of the economy (Levine, 2000). The rising importance of the financial sector in modern economies, as well as the rapid rate of innovation in this sector, has generated a research interest in financial innovation. This paper will review the impact of financial innovation and its impact on economic growth in Kenya and whether increased financial innovation can be good for the economy. It shall try to establish to what level is financial innovation is viable and sustainable for economic growth particularly in an emerging economies perspective.

Financial innovation is an important research topic in modern economics. Markets and organizations produce various new products and services in order to satisfy the investors demand. Financial innovation is an ongoing process where new financial products, services and procedures are created and standardized products are differentiated in order to response at the continuously changing economic environment. This running process has various periods of uncertainty. thus, the purpose of the introduction of a financial innovation to market participants is the minimization of costs and the reduction of risk exposure among other function such moving funds across time and space (e.g., savings accounts),the pooling of funds (e.g., mutual funds), managing risk (e.g., insurance and many derivatives products), extracting information to support decision-making (e.g., markets which provide price information, such as extracting default probabilities from bonds or credit default swaps), addressing moral hazard and asymmetric information problems (e.g., contracting by venture capital firms); and facilitating the sale or purchase

of goods and services through a payment system (e.g., cash, debit cards, credit cards)(Merton,92)

1.1.1Financial Innovation

Financial innovation is the unanticipated improvement in the array of financial products and instruments that are stimulated by unexpected change in customer needs and preferences, tax policy, technology and regulatory impulses (Bhattacharyya & Nanda, 2000). The developments in the financial sector have not only led to the increase in the number of financial institutions, but also the development in level of sophistication with new payment systems and asset alternatives to holding money. This has resulted mainly from technological advancement and increase in competition as the number of institutions increase. Developments in payment systems have started to create close substitutes for hard currency, thus affecting a core part of banking.

The quest for profit forces companies, households and economic agents to look for new and improved products, services, processes and forms or structures of companies that will decrease their production costs, will satisfy, in a great range, their customers' demand and will bring higher profits. Sometimes this quest is made through official Research & Development (R&D) programs or sectors of a company. Other times, it is a hazardous result of control processes or of the trial and mistake method. Today, more than ever before, innovation, enterprise and intellectual assets drive economic growth and increase standards of living. Hence Innovation is instrumental in creating new jobs, providing higher incomes, offering investment opportunities, solving social problems, curing disease, safeguarding the environment, protecting our security and transparency in organization and governments.

For the purpose of this study we are going to measure financial innovation through the amount of RTGS transaction, amount of mobile money transaction, amount of new products registered and amounted of cheques cleared through the automated clearing house. This information will accessed from the central bank of Kenya and the Kenya bureau of statistics.

1.1.2 Economic Growth

Economic growth is defined as 'a rise in the total output (goods or services) produced by a country. It is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. Economic growth occurs whenever people take resources and rearrange them in ways that are more valuable. Economic growth refers only to the quantity of goods and services produced; it says nothing about the way in which they are produced (Mackinnon, 1973).

The performance of an economy is usually assessed in terms of the achievement of economic objectives. These objectives can be long term, such as sustainable growth and development, or short term, such as the stabilization of the economy in response to sudden and unpredictable events, called economic shocks which are very common in Kenya such political instability, ranging interest rates and labour unrest which are also common in emerging markets. Hence in order to measure economic growth it's in order to analyse, control and measure the following economic indicators such as Growth in real national income, investment levels and the relationship between capital investment and national output, levels of savings and savings ratios, price levels and inflation, competitiveness of exports, levels and types of unemployment, employment levels and patterns of employment, trade deficits and surpluses with specific countries or the rest of

the world, debt levels with other countries, the proportion of debt to national income, the terms of trade of a country, the purchasing power of a country's currency, wider measures of human development, including literacy rates and health care provision.

Economic growth can be measured in nominal terms, which include inflation, or in real terms, which are adjusted for inflation i.e. by the percent rate of increase in the gross domestic product (GDP). Economic growth measures growth in monetary terms and looks at no other aspects of development (Ayres, Robert, Warr, and Benjamin, 2006).

1.1.3 Financial Innovation and Economic Growth

The relationship between innovation and economic growth has been well studied. However, that is not to say that it is well understood. Renowned scholars continue to work with incredibly simplified models of an incredibly complex economy. Consequently, empirical results are usually carefully annotated with caveats noting the limitations of all findings and the great uncertainties that remain concerning fundamental assumptions in the field. (Statistics Canada, Innovation Analysis Bulletin, 2002)

Theoretical relation between financial innovation and economic growth has been argued to be positive but remain unclear. Financial development and innovation and economic growth are thus clearly related, and this relationship has occupied the minds of economists from Smith to Schumpeter and the direction of causality have remained unresolved in both theory and empirics. Moreover, the wide range of organizational forms involved precluded any clear conclusion as to what kind of financial institutions might maximize economic growth. Hence Financial innovations can be instrumental to

lead a higher level of savings, capital accumulation and hence a higher level of economic growth.

Financial innovations can be seen as playing a role akin to that of the general purpose technologies delineated by Bresnahan and Trajtenberg (1995) and Helpman (1998): not only do these breakthroughs generate returns for the innovators, but they have the potential to affect the entire economic system and can lead to far-reaching changes. For instance, these innovations may have broad implications for households, enabling new choices for investment and consumption, and reducing the costs of raising and deploying funds.

Aghion (2005) and Arcand (2012) found that financial innovation is associated with higher levels of economic growth, even when controlling for aggregate indicators of financial development, in their sample of high-income countries, suggests that it is not so much the level of financial development, but rather the innovative activity of financial intermediaries, which helps countries grow faster at high levels of income. Their results, however, point again to the double-sided nature of financial innovation, bringing opportunities but containing risks, which calls for appropriate regulatory policies.

There is a link between financial development and innovation and reduced income inequality and poverty alleviation (Beck, Demirguc-Kunt and Levine, 2007). This has been clearly shown by Mpesa and other mobile banking that have transformed Kenya in great way by reducing poverty level by increased access to small amounts of capital, access to banking facility and micro insurance product to the rural areas of Kenya where initially banking and insurance services were not available.

Nowadays, financial institutions function within a complex business environment that is constantly changing. Its rate of change is usually higher than the rate of change in a financial institution. Thus, each institution has to spot the main changes that happen in the financial world and to adjust to them in order to survive and evolve. Even if those changes create insecurity they also create opportunities for innovation that can yield profit if an institution is prepared for them.

1.1.4 Economic Growth in Kenya

Kenya's economy continues to recover in 2013 from the slowdown experienced in 2011. Real GDP growth in the year accelerated to 5.2%, 4.3% and 4.6% in the first three quarters of 2013 primarily driven by financial intermediation, tourism, construction and agriculture.

Kenya's long term development agenda spelt out in the vision 2030, targets an annual growth rate of 10% in the medium term with an investment rate of 30% of which a significant proportion will be financed through mobilizing domestic savings. While Kenya's financial sector is viewed as substantially diversified, it is dominated by banking institutions which have not evolved to provide long term capital adequately. The equity and debt market are struggling to gain momentum. The development financial institutions have also not been performing. If the anticipated investment level is to be achieved, it means that the financial sector must mobilize adequate and appropriate finance to meet the financing needs.

Kenya is on the road to achievement of vision 2030 which is driven by innovation, research and development, social and political inclusion. Hence the role of financial

innovation is very core for Vision 2030 achievement. So far Kenya as sees tremendous achievement in terms of financial innovation such as the development of products mpesa, mshari and mkeso which are driving financial inclusion. Today the capital market authority, Nairobi stock exchange, unclaimed asset authority and credit bureau are among some of the most thriving institution in Kenya financial market.

Figure 1.1 Kenya GDP Annual Growth Rate

http://www.tradingeconomics.com/charts/kenya-gdp-growth-annual.png?s=kenyagdpyoy

1.1.5 Financial Innovation in Kenya

Kenya is increasingly becoming the silicon valley of financial innovation in Africa and the rest of the world (Mwangi, 2010). This as seen the launch of sum of the most innovative products in the financial market. Kenyan financial sector comprises of Banking, Insurance, Capital markets, Pension Schemes and Quasi-banking institutions such as: Savings and Credit Cooperative Societies (SACCOs); Microfinance Institutions (MFIs); Building Societies, Kenya Post Office Savings Bank (KPOSB); Development Finance Institutions; (DFIs) and informal financial services such as Rotating Savings and

Credit Associations (ROSCAs). Financial intermediation in Kenya has continued to recorded high growth rates due to increased lending as reflected by the rise in domestic credit backed by significant financial innovation.

Some of these products include mobile technology services such as M-pesa which is a mobile money transfer services a product of safaricom ltd, M-kesho which is a mobile banking system a product of Equity bank Kenya, mobile insurance services by britam insurance, online banking, mobile banking, real tine gross transfer's (RTGS), banc assurance, Islamic banking, increased use of ATM and coming of new institution such as branch banking, credit bureau and rating agency, unclaimed asset authority, rejuvenation of the capital market and Nairobi capital exchange and branding of banks among other changes such as changes in regulation and taxation within the financial sector.

1.2 Research Problem

The centrality of finance in an economy and its importance for economic growth (Levine, 1997) naturally raises the importance of financial innovation. Since finance is an input for virtually all production activity and much consumption activity, improvements in the financial sector will have positive direct ramifications throughout the economy.

The existing theories on financial innovation are not very clear on role of financial innovation but seem to suggest that finance development contributes to economic growth. The empirical literature suggests that financial development has a positive significant effect on the economy. It has also been identified that various authors have addressed the issue of financial innovation with a bias to the role of the banking and insurance sector in financial innovation.

Studies conducted in respect to financial innovation concentrated on banking and insurance sector and its impact on performance on a micro perspective. Ngigi (2009) finding indicate that financial innovation in payment systems result into improved financial performance of commercial banks and thereby to that of the banking sector as a whole. Oloo (2007) revealed that entrance of new banks is credited with helping to drive down banking charges, improve access to banking services and spark off a wave of new products and services. The issue of financial innovation is key since the vision 2030 secretariat identifies that innovation in financial markets as key in providing the boost necessary for achieving the social economic blueprint.

The financial innovation will be the independent variable while economic growth will be the dependent variable. Financial innovation will adopt four variables as follows RTGS transaction; amount of mobile money transaction; amount of new products registered and amounted of cheques cleared through the automated clearing house. It is expected that financial innovation will impact positively the economic growth similar to findings of Antony and Antony (2012), Tufano (2003), Tedesse (2000), Hsu and Lin (2000) and king and Levine (1993).

1.3 Research Objectives

Hence this research paper will try to investigate the relationship of financial innovation and economic growth in Kenya looking at the macro level of the industry. The paper will try at the macro level by analysis macro level data obtain from the central bank and Kenya bureau of statistics. To do so will try to answer the following question.

(1) To analyse the effect of financial innovation on economic growth and its impact in Kenya.

1.4 Value of the Study

This study will help to establish a link between financial innovation and economic growth in general. Since currently there are few study one in Kenya in connection between financial innovation and economic growth this study will to bring out any relationship between financial innovation and economic growth and also help to see if there is any value for emerging markets like Kenya.

The findings can further be applied by policy makers in the area of financial services innovation and banking industry. Financial innovations are touted as the way to improve financial inclusion to drive economic development towards attainment of vision 2030. Policy makers can hence use the study findings to design policies that will encourage financial innovation but at the same time instilling effective regulatory environment.

This study will add more knowledge on the concept of financial innovation and give more empirical findings on the relationship between financial innovation and economic growth. This will provide more literally material which will be of value to scholars, students and researchers. This study can also be used as a basis of further research and also in academics in the area of financial innovation and deepening in developing nations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter a critical review of related literature is carried out. The chapter is discussed following the variables used in the study. It begins by discussing and giving an overview of the theoretical review and empirical of financial innovation.

2.2 Theoretical Review

The theoretical literature has provided different hypotheses on the effects of financial innovation. The traditional innovation-growth view posits that financial innovation improves the quality and variety of banking services (Merton, 1992; Berger, 2003), facilitates risk sharing (Allen and Gale, 1988, 1991 and 1994), completes the market (Duffie and Rahi, 1995; Elul, 1995; Grinblatt and Longstaff, 2000), and improves allocative efficiency (Ross, 1976, Houston et al., 2010). Dynan, Elmendorf, and Sichel (2006) suggest that financial innovation has played a key role in reducing the volatility of economic activity in the early parts of the 21st century.

2.2.1 The Schumpeterian Approach Theory

This approach was advanced by Schumpeter (1940). In the 1940s the economist Joseph Schumpeter assigned the key role in economic growth firstly to the disruptive activity of entrepreneurs, and secondly to large corporations, each of which fed a process of creative destruction by causing continuous disturbances in the economic system. The source of these disturbances was innovation, which created as Schumpeter put it: competition from the new commodity, the new technology, the new source of supply, the new type of organization, competition which commands a decisive cost or quality advantage and

which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives. Hence it's important to investigate whether it's the disruptive nature of financial innovation that drive economic growth or limit hence this theory will be key to this analysis.

2.2.2 The Transaction Cost Approach Theory

The transaction cost innovation theory's main pioneers are Hicks & Niehans (1983). They thought that the dominant factor of financial innovation is the reduction of transaction cost, and in fact, financial innovation is the response of the advance in technology which caused the transaction cost to reduce. The reduction of transaction cost can stimulate financial innovation and improvement in financial services. This theory studied the financial innovation from the perspective of microscopic economic structure change. It thought that the motive of financial innovation is to reduce the transaction cost. And the theory explained from another perspective that the radical motive of financial innovation is the financial institutes" purpose of earning benefits. This theory discussed the motive and the process of financial innovation from different sides. Hence this theory will be used to establish the financial innovation and economic performance from the transaction point of view to see whether its transaction cost derived from financial innovation that drive economic activity linking to economic performance.

2.2.3 The Regulation Innovation Theory

Regulation innovation theory was put forward by Scylla et al (1982). It explains financial innovation from the perspective of economy development history. The theory proposes that financial innovation connects with social regulation closely, and it is a regulation

transformation which has mutual influence and has mutual causality with economic regulation. Scylla et al thought that it is very difficult to have space of financial innovation in the planned economy with strict control and in the pure free-market economy, so any change brought about by regulation reform in financial system can be regarded as financial innovation. The theory proposes a regulation framework for all financial innovation and it would be important to check the value of this proposition toward economic growth for our study.

2.2.4 Merton's Market Efficiency Theory

Merton's market efficiency theory is based on the notion that financial innovations are motivated by forces designed to increase market efficiency and improve social welfare.

Merton (1990) argued that the market is not perfect hence financial institutions must innovate to improve market efficiency. Merton (1990) gives three motivations for introducing innovations namely, the creation of new financial strictures that allow risk sharing, risk pooling and hedging as well as new structures for transferring resources, to improve economic efficiency and liquidity and to reduce agency costs. Hence for our study this proposition is very key to identify whether market efficacy are actually good for economic growth.

2.3 Determinant of Economic Growth

Financial innovation can be influenced by several factors. Some of the factors as discussed below. However it's good to not that these are not the only factor that influence economic growth but for our study will consider the following factors.

2.3.1 Financial Innovations

Factors of financial innovation that impact economic growth include the impact of emerging technologies e.g. mobile and internet banking, Impact of Internet on management and administration, reduction in communications costs and increased remote working e.g. telecommuting, Research and Development activity Impact of technology transfer within the country and its environments. The connection between economic growth and financial innovation is not very clear but research show a positive correlation between financial innovation and economic growth (Stein, 1970).

2.3.2 Political Stability of the Country

Political instability includes Government type and stability, Freedom of press, rule of law and levels of bureaucracy and corruption, Regulation and de-regulation trends, Social and employment legislation, Tax policy, and trade and tariff controls, Environmental and consumer-protection legislation and Likely changes in the political environment. Economic growth and political stability are deeply interconnected. On the one hand, the uncertainty associated with an unstable political environment may reduce investment and the speed of economic development. On the other hand, poor economic performance may lead to government collapse and political unrest. The better the political stability the chances of economic growth as shown Alesina and Tabellini (1989)

2.3.3 Economic and entrepreneurial Activity

Entrepreneurs play important role by introducing important innovations by entering markets with new products or production processes (Acs and Audretsch, 1990 and 2003), increase productivity by increasing competition (Geroski, 1989; Nickel, 1996; Nickel et

al., 1997), enhance our knowledge of what is technically viable and what consumers prefer by introducing variations of existing products and services in the market, Knowledge spillover (Audretsch and Feldman, 1996; Audretsch and Stephan, 1996; Audretsch and Keilbach, 2004) and lastly, they may be inclined to work longer hours and more efficiently as their income is strongly linked to their working effort. Hence economic and entrepreneurial activity is very important in the process of economic growth.

2.3.4 Social Legal Environment

Social factors relate to change is society and social structures such changes include changes in the structure of the population, and in consumer lifestyles and behavior affect buying patterns and while Legal factors relate to changes in laws and regulations and businesses must be careful to keep within the law and to anticipate ways in which changes in laws will affect the way they must behave. The effectiveness of legal institutions had a much higher correlation with increases in market capitalization and improvements in liquidity (Pistoret al., 1999) this may actually translate to economic growth.

2.4 Empirical Review

Antony and Antony (2012) looked at the relationship and Granger causality between financial innovations and economic growth in Ghana, for the period 1963 to 2009. They adopted a simple endogenous growth and the ARDL co integration models to aid in establishing both the long run and short run relationships between financial innovations and economic growth in Ghana. The results showed that financial innovation has short

run positive effect on economic growth. However, in the long run, financial innovation is detrimental to economic growth. Causality also runs from financial innovations to economic growth. The evidence advocates for regulations toward improving financial innovations through long term savings.

Laeven, Levine and Michalopoulos (2011) explore the relationship between the introduction of private credit bureaus and economic growth and show that this specific financial innovation results in faster convergence of countries to the growth path of the most advanced country. There is no much data on this in Kenya but current study show that has led in more customers are controlling their credit history and reducing instances of poor credit rating hence making access of credit easier and advancement of credit to right consumer will mitigating the bank exposure to bad credit.

Samuel and Emeka (2009) did a study to examine the financial deepening and economic development in Nigeria between 1986 and 2007. The central focus was the high level of financial deepening and growth in an economy. This was due to the central role of the financial system in mobilizing savings and allocating same for the development process. The study made use of secondary data, sourced for a period of 22 years. They specified nine explanatory variables for the study based on theoretical underpinnings. They sought to establish a relationship between these variables and financial deepening index. The two stages least squares analytical framework was used in the analysis. A trend analysis was also done in the study. At the end of the study, they found that financial deepening index is low in Nigeria over the years. They also found that the nine explanatory variables, as a whole were useful and had a statistical relationship with financial deepening. But four of the variables; lending rates, financial savings ratio, cheques/GDP

ratio and the deposit money banks/GDP ratio had a significant relationship with financial deepening. They concluded that the financial system has not sustained an effective financial intermediation, especially credit allocation and a high level of monetization of the economy. Thus the regulatory framework should be restructured to ensure good risk management, corporate governance and stemming systemic crisis in the system.

Tadesse (2006) examined if the financial architecture of an economy is oriented towards a financial purchase or towards the banking sector and if this is an important factor for the long-term economic growth, especially for innovations and technology. The writer used data that cover a large number of countries and industries and focus on the advantages of the banking sector against purchases during the getting informed process. The results showed that financial architecture has an important impact on industrial activities on innovation and that the oriented investment design in the market has a positive impact on technological development, a fact that agrees with the theoretical approaches that want markets to have a comparative advantage in the identification and funding of new technologies.

Tufano (2003) provides an excellent survey of the literature on financial innovation. The standard explanation for financial innovation is that it helps correct some kind of market inefficiency or imperfection. For example, if markets are incomplete then financial innovation can improve opportunities for risk sharing. If there are agency conflicts, then new types of security can improve the alignment of interests. Other important motivations for financial innovation are to lower taxes or to avoid the effects of regulations. Since both issuers and buyers must benefit from an innovation for it to be

successfully introduced, the traditional view of financial innovation has been that it is desirable.

Hsu and Lin (2000) investigated the relationship between long-run economic growth and financial development to see whether stock market and financial institutions promote economic growth using Taiwan's data from 1964 through 1996. The empirical method utilized is the vector autoregressive error-correction model proposed by Johansen and Juselius (1992). They found that both banking and stock market development are positively related with short-run and long-term economic growth. In particular, the financial depth measured by the ratio of the broad monetary aggregate (M2) and GDP had strong effect on the output growth. In addition, they also found that Granger causality exists between financial development measures and economic development in both directions occurred during the study period (i.e. from 1964 through 1996).

Levine (1997) in his study highlighted the relation between financial and economic developments as the level of financial development is an omen of economic growth, of capital accumulation and of technological change. He stated that financial innovation hinges mainly on financial development. Levine explained the way in which the financial system acts upon economic growth and believes in a functional approach for the understanding of the role that the financial system plays in economic growth. This approach focuses on the frictions between the functions' development and their quality that originate from the financial system, especially from innovation.

De Gregorio & Guidotti (1995) found that the high level of bank credit to GDP ratios in Latin America during the 1970s and 1980s was actually negatively correlated with

growth. They attribute this result to the inadequate regulation and deposit insurance policies of the time, which led to an unwarranted over-expansion in credit and subsequent banking crises. Loayza & Rancière (2004) have also found evidence of a negative relationship between short-term (temporary) changes in bank credit and growth in those countries that present high levels of financial fragility (proxied by credit volatility and frequency of banking crises). Periods of financial fragility in turn have coincided in many countries with financial liberalization. They claim that these temporary effects are compatible with the positive impact that permanent increases in bank credit have on economic growth over the long term, however.

In a study of the relationship between financial liberalization and financial fragility, Demirguc-Kunt and Detragiache (1998) study 53 countries during the period 1980-1995. They find that financial liberalization increases the probability of a banking crisis. Drees and Pazarbasioglu (1995) argue that financial liberalization played an important role in the Nordic crises. Hence it's also critical to examine the negative side of financial innovation as may cause adverse problem to the economy as evidenced recently in the US economy which is currently recovering from the side effect of financial innovation.

The pioneering study by King and Levine (1993) and subsequent work by Levine and Zervos (1998), Levine (2000), Levine et al. (2000), and Beck and Levine (2001) have provided new evidence in an attempt to resolve this debate. They identify three indicators of financial sector development that are best at explaining differences in economic growth between countries over long periods: bank credit to the private sector, stock market activity (proxied by the turnover rate or the ratio of traded value to GDP), and features of the legal system such as the extent of shareholder and creditor protection.

Levine (2000) further shows that the impact of financial development on growth acts mainly through total factor productivity rather than through capital accumulation or savings rates. He concludes, therefore, that „maybe Schumpeter was right" . A somewhat different conclusion, albeit supportive for the general direction of the argument is that of Aghion et al (2005) who claim that financial development explains whether there is convergence or not but it does not exert a direct effect on steady-state growth.

Oruo (2013) looked at the relationship between financial inclusion and GDP growth in Kenya. The main objective of this paper was to examine the factors determining the relationship financial inclusion and GDP growth in Kenya. The independent variable in this study was the GDP growth while the independent variables included; branch networks, number of mobile money users/ accounts, bank lending rates and number of automated teller machines in the country. The study adopted a descriptive research design, used secondary data collected from various sources for the 2002/2003-2011/2012 financial periods collected annually. The study used a survey drawn from the Kenya economy. The study findings established that there was a strong positive relationship between GDP growth and Branch Networks which is one of the proxies of financial deepening. The study findings further established that GDP growth over the study period was increasing as well as number of automated teller machines, number of mobile money users/accounts and branch networks.

Mbiti and Weil (2011) in their study showed that there is limited evidence on the impacts of these technological developments on monetary aggregates and relations. This report reviews the literature on economic impact of ICT developments in the financial sector on the conduct of monetary policy in East Africa. It further examines the development and adoption of various products in East Africa and examines factors that drive the demand

for these products. Using a combination of data, the report discusses the implications of the rapid adoption of these products on the conduct of monetary policy in East Africa.

2.5 Summary of Literature Review

The potential contribution of financial innovation to economic growth is considerable, but cannot be taken for granted depends on the construction of the appropriate institutional structure. There is substantial evidence in favour of the link between financial innovation and economic growth as indicated by Levine (2000) but the empirical evidence is not quite conclusive to what degree or percentage. Hence there is need to continue to investigate the relation of financial innovation and economic growth.

Hence it's critical to examine financial innovation in totality since it can also be harmful consumers and affecting the economy in general as shown by Demirguc-Kunt and Detragiache (1998) hence need to have mechanism in place to check all forms of financial innovation being adopted by financial institution. Hence these calls for regulation and monitoring of the financial institution to ensure that the market is not exploited and that financial institution do not take up unnecessary risk which can be harmful to both the institution and the economy.

Previous studies have also tended to pool developed and developing countries when examining the relationship between financial development and economic growth. Yet it is quite likely that the impact of financial development will differ depending on the stage of economic development of a country. We are not aware of any study that has tried to shed light on this specific conjecture. Hence this paper will try to investigate the issue of economic growth as influence by financial innovation in Kenya as a case of developing or emerging economy.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the preferred research design, sampling design, data collection, the analytical framework and the research model in the study. The chapter considers in detail the methods that were used to collect primary or secondary data required in the study. In this chapter, the researcher discusses the research design and population size used. The researcher also discusses how collected data was analysed giving details of any models or programmes that were used in analysis with reasons as to why these particular models or programmes were applied.

3.2 Research Design

This is the plan and structure of investigation so conceived so as to obtain answers to research questions Kerlinger (2008). In this paper descriptive design was adopted. Descriptive studies are usually the best methods for collecting information that will demonstrate relationships and describe the world as it exists. These types of studies are often done before an experiment to know what specific things to manipulate and include in an experiment. Bickman and Rog (1998) suggest that descriptive studies can answer questions such as what is or what was. Experiments can typically answer why or how question. Hence for this study adopted descriptive design for the study.

3.3 Data Collection

This study relied on secondary data sources extracted from the annual reports, publications, industry analysis, interview, trend analysis and board of directors speeches on corporate pages. Most data will be sourced from the central bank of Kenya, Kenya bankers association, Kenya institute of insurance and Kenya bureau of statistics.

3.4 Data Analysis

The relationship between the dependent variable and the independent variables are determined by the below presented regression model. The data analysis covered the period between 2008 to 2013 financial years. The data was analysed on monthly basis and based on sixty data points. The study variables were controlled using interest rate as a normalizing factor. Variables data were analysed using Statistical Package for Social Sciences (SPSS) The Regression model was of the form below;

$Y= \beta 0+\beta 1X1+\beta 2X2 +\beta 2X2+ €$

Where: Y= GDP Growth

X1= amount of money transacted through the mobile money transfer system between 2008/2013 financial years in Kenya

X2 =amount of money transferred through the RTGS system between 2008/2013 financial year in Kenya

X3=amount transferred through the new check clearing system during the period2008/2013

X4= interest rates prevailing in Kenya during 2008 to 2013 financial years in Kenya

The study variable were derived from central bank of Kenya payment statistics and correlation analysis will also be performed to find out whether the variables are related to each other in the model.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of data, findings from the study and discussion of the findings. Section 4.2 descriptive statistics analysis while section 4.3 correlation analysis from the study. Section 4.4 discuss the regression analysis of the study. Section 4.5 presents discussion of the findings where the findings are compared and contrasted with other results from previous studies.

4.2 Descriptive Statistics

The study sought to collect and analysis consolidated data on Kenya economic performance and key financial data. Secondary data obtained from reports published by the Central Bank of Kenya; which is also the regulator of the banking sector was used. Dependent variable, was obtained from CBK's reports. The independent variables; automated clearing house transaction, mobile transaction volumes, volume of cheques cleared and RTGS turnovers and interest rates were obtained from CBK's annual statistics presented under payments statistics and GDP statistics were obtained from Kenya bureau of statistics. A study period of 6 years (2008 to 2013) was used. The data is represented in tables. Quantitative Statistical measures such as correlation using means, standard deviations and correlations as shown in table 4.1

Table 4.1 Descriptive Statistics

Descriptive Statistics			
	Mean	Std. **Deviation**	N
Gross Domestic **Product**	2.70000	1.968394	60
INTEREST RATES	2.11667	1.896399	60
Mobile Transactions	5.08333	2.133603	60
Volume of CHQs (Billions)	2.20000	1.470616	60
Volume of RTGS(Billions)	3.91667	1.889235	60

4.3 Correlation Analysis

A partial correlation analysis using Karl Pearson correlation coefficient was performed. A negative coefficient indicated a negative relationship between the variables correlated; in which case an increase in one variable would result into a decrease in the other variable and vice versa. A positive coefficient on the other hand indicates a positive relationship in the variables; meaning that changes in the variables move together. An increase in one variable would therefore result into an increase in the other variable and vice versa.

GDP was positively correlated with mobile transaction and well as RTGS annual turnover values and negative correlated to volumes of cheque transactions and interest rates. Table 4.2 below indicates that Gross Domestic Product is positively correlated with RTGS, Mobile transactions and negatively correlated with volume of cheques payments and interest rates. The correlation between Gross Domestic Products and volume of cheques transaction (-0.599) is a negative correlation. This imply that as one variable increases the other decreases.

The correlation between Gross Domestic Products and RTGS is also a little weak (.200) indicating that there is a positive linear association between GDP and RTGS. Which indicates that it had a positive relationship with economic growth. This indicates that

value RTGS transactions is a significant predictor of economic growth in Kenya. This indicates that as value of mobile transactions increase, GDP increases.

The correlation between Gross Domestic Products and mobile transaction is also a strong (0.640) indicating that there is a positive linear association between GDP and mobile transactions. This indicates that value mobile transactions is a significant predictor of economic growth in Kenya. This indicates that as value of mobile transactions increase, GDP increases.

The correlation between Gross Domestic Products and interest rates is also a little weak (-0.333) indicating that there is a negative linear association between GDP and interest rates. Which indicates that it had a negative relationship with economic growth. This indicates that value interest rate is a significant predictor of economic growth in Kenya. This indicates that as value of interest rates increase, GDP decreases but at a small portion.

These findings indicate that the four independent variables have some relative linear association with GDP hence can be used in the study.

Table 4.2 Correlation between GDP, Interest Rates, Mobile transactions, Automated Clearing and RTGS

Correlations						
		GDP	RTGS	Cheque	Mobile System	Interest Rates
GDP	Pearson Correlation	1	.200	-.599**	.640**	-.333**
RTGS	Pearson Correlation	.200	1	-.351**	.373**	-.482**
Cheque	Pearson Correlation	-.599**	-.351**	1	-.644**	.687**
Mobile System	Pearson Correlation	.640**	.373**	-.644**	1	-.595**
Interest Rates	Pearson Correlation	-.333**	-.482**	.687**	-.595**	1

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

4.4 Regression Analysis

A regression analysis between the dependent variable and the independent variables was performed; independent variables being value of mobile transaction, value of cheques cleared, RTGS values and interest rates. The dependent variable was Gross Domestic Product items for year.

4.4.1 Model Summary

Results in table 4.3 indicate that the r-squared for the model was 0.716, which indicates that the independent variables can be used to explain about 70% of the variation in the economic sector. This indicates that the regression model has a strong explanatory power

as only about 30% of variation in economic growth is not explained by the model. R (.716) R Square (0.513) Adjusted R Square (.484) Std. Error of the Estimate was (.91107).

Table 4.3 Regression Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.716[a]	.513	.484	.91107	1.002

a. Predictors: (Constant), Volume of RTGS(Billions), Interest Rates, Volume of CHQs (Billions), Mobile Transactions

b. Dependent variable: GDP

4.4.2 Analysis of Variances

Results in table 4.4 give the analysis of variances in the regression model. These results indicate that the model had an f-ratio of 17.641 which was significant at 0 % level of significance. This result indicates that the overall regression model is statistically significant compares to the mean score and is useful for prediction purposes at 10% significance level. This further indicates that the independent variables used (value of sector RTGS transfers for year and value of sector automated clearing transactions, value of interest rates and value of mobile transaction for year research) are statistically

significant in predicting economic growth. Model Sum of Squares df Mean Square F Sig. Regression are as shown the table 4.3

Table 4.4: Analysis of Variances in the Regression Model

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	58.572	4	14.643	17.641	.000[b]
	Residual	55.614	67	.830		
	Total	114.186	71			

a. Dependent Variable: GDP

b. Predictors: (Constant), Interest Rates, RTGS, Mobile System, Cheque

4.4.3 Model Coefficients

Results in table 4.5 below present the test of the statistical significance of the independent variables in the model. This provides the estimates of independent variables, their standard error and the t-ratios. The table also provides the statistical significance of each independent variable in the regression model. The results indicate that the t-ratio for value of sector RTGS transfers for year was -.064. This t-ratio is significant at 85 % level of significance (0.845) which indicates that value of the RTGS transfers for year are an insignificant predictor of economic growth in Kenya. The estimate of value of the RTGS transfers for year which indicates that value of the RTGS transfers is negatively related to economic growth.

The value of sector automated clearing transactions had a coefficient estimate of -1.892 which indicates that it had a negative relationship with economic growth. The t-ratio for

value of sector automated clearing transactions was -3.687 which was significant at 0% level of significance. This indicates that value of sector automated clearing transactions is a significant predictor of economic growth. This indicates that as value of sector automated clearing transactions decrease, economic growth increases.

The value of interest rates had a coefficient estimate of 0.166 which indicates that it had a negative relationship with economic growth. The t-ratio for value of sector automated clearing transactions was -2.242 which was significant at 2.8 % level of significance. This indicates that value of interest rate is a significant predictor of economic. This indicates that as value of interest rate decrease, economic growth increases.

The value of sector mobile transactions had a coefficient estimate of .712 at 0% significant level which indicates that it had a positive relationship with economic growth. This indicates that value of sector mobile transactions is a significant predictor of economic growth in Kenya. This indicates that as value of sector mobile transactions increase, economic growth increases.

Table 4.5: Test of Significance of Independent Variables

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics
		B	Std. Error	Beta			Tolerance
1	(Constant)	10.046	5.663		1.774	.081	
	RTGS	-.064	.325	-.019	-.196	.845	.756
	Cheque	-1.892	.513	-.473	-3.687	.000	.442
	Mobile System	.712	.162	.515	4.407	.000	.533
	Interest Rates	.166	.074	.288	2.242	.028	.439

4.5 Discussion

Study results indicated that the independent variables (RTGS, Mobile money transaction, automated clearing house and interest) explain and can therefore predict can be used to predict economic performance. These variables could explain 71.6% of the variation in economic performance (r-squared = 0.716). This indicates that the regression model had a strong explanatory power as only 28.4% of variation in economic performance is not explained by the model. This study result is similar to study done by Justus (2013) that concluded that financial innovation has an insignificant positive impact on financial deepening. Both mobile money innovations and mobile banking were to have significant effects on financial deepening in Kenya and translating to economic growth.

The study results indicated that the t-ratio for RTGS system was -0.196, the ratio being significant at 0.845 level of significance which indicates that RTGS, is a negative predictor of economic growth in Kenya. While the t-ratio of automated clearing transactions had a coefficient estimate of -3.689 which indicates that it had a negative relationship with economic growth in Kenya. This implies that as the value of sector automated clearing transactions decrease, economic growth increases. The t- ratio of the mobile banking transaction was 4.404 which was significant at 0.00 level of significance. This implies that as the value of sector mobile banking transactions increase, economic growth increases. The t-ratio for interest rates system was 2.738, the ratio being significant at 0.028 level of significance which indicates that interest, is a positive predictor of economic growth in Kenya as interest rates increases the rate of economic growth declines.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the researcher presents the summary, conclusions and the Recommendations made from the study findings. In section 5.2, summary of findings are presented. Section 5.3 presents conclusions made from the study findings while section 5.4 presents recommendation8 made after considering the study findings. Section 5.5 presents suggestions for any further studies that may be done in field of financial innovation in the banking sector

5.2 Summary of the Findings

The study sought to collect financial industry data in Kenya to analyse the impact of financial innovation on economic growth in Kenya. Data analysis was through multiple linear regression and correlation analysis. Correlation analysis was through Karl Pearson correlation coefficients. Study results indicated that the independent variables (RTGS, Mobile transaction, volume of cheques cleared) explain and can therefore predict financial innovation in Kenya. These variables could explain 72.0% of the variation in economic growth in Kenya (r-squared = 0.716). This indicates that the regression model had a strong explanatory power as only 28.0 % of variation in economic growth in the financial sector is not explained by the model.

The t-ratio for RTGS values was -.196, the ratio being significant at 0.845 level of significance which indicates that RTGS is a negative predictor of economic growth in Kenya. While the t-ratio of sector automated clearing transactions had a coefficient estimate of -3.687 which indicates that it had a negative relationship with economic growth. The t-ratio for value of mobile transactions was 4.404 which was significant at 0% level of significance. This indicates that value of mobile transactions is a significant predictor of economic growth. The t-ratio for value of interest was 2.242 which was significant at 2.8 % level of significance. This indicates that value of interest is a significant predictor of economic growth. This implies that as the value of interest rates increase, economic growth decreases.

5.3 Conclusion

The evolution of financial innovation in recent years has had a tremendous contribution to the financial and economic sector because it has expanded the option of market participation among new financial products, services and process. It's an answer to continuous search for minimization of costs and finding a more flexible financial instruments that can restructure the capital markets and address the risk posed due to rapid advancement of economic environment, technology, competition and the global markets.

From the study results, it is evident that financial innovation in payment systems result into improved economic growth as a whole. This is supported by the correlation between Gross domestic Products and the value of RTGS, value of cheques cleared, value of mobile money transaction and value of automated clearing house. Even previous study covered have stated the importance of financial innovation.

Financial innovation presents more convenience, efficiency and security to customers and industry players resulting to more demand (uptake) for the new innovations. Demand for traditional payment systems reduces as customers switch to the more effective payment systems and hence the positive result that were out during the study.

It would be imperative good for policy makers and influencer to encourage more innovation and uptake of financial innovation. The concentration can tilted more toward product, policy and process innovation rather than institutional innovation. Has evidenced from mobile transaction and its impact on economic advance in Kenya.

5.4 Recommendations for Policy and Practice

Financial innovation can help to increase the efficiency of the financial system, which facilitates the operation of monetary policy, boost customer experience but at the same time complicates the environment in which monetary policy operates as indicated in the research results. To deal with this complexity, central banks need to respond by monitoring the financial landscape, by following developments closely and by trying to predict the consequences of innovations. Hence more data collection, research and focus need to target toward this domain.

Hence it’s critical to for the governments and research institution to explore some of the following suggestion. The significant factor that create need for innovation, encourage firms to create innovation to complete markets and minimize risk instead of reacting to difficulties or as temporary measures. Hence active of innovation rather than reactive innovation should be encourage by creating friendly environments that can induce

innovation. Hence future innovation should move toward design, creation and diffusion of financial innovation for there to a great impact in economic growth such as the MPesa innovation.

There also exist very little empirical literature exist on financial innovation in Kenya particular on the macro level hence more research and focus need to be targeted toward this area particularly due to its critically importance to the Kenyan economy. Hence more research in this area will open more space in financial innovation.

As evidence from the research the government should consider tax incentives in order to encourage more resourced to be diverted toward financial innovation. Such incentives should include tax relief on research and development, grant government fund to private sector to encourage innovation, encourage technology and labour transfer from the international market and reduction of tax bracket for local firms to encourage innovation with the financial market.

In practice it's essential for innovative firms to reconsider and divert more attention toward the area of financial innovation and mostly toward mobile and telecom based financial innovation rather than having key focus on product and service innovation as it's evident in the Kenyan market. This due to high level of correlation between financial innovation and economic growth as shown by the study.

Financial innovation is key to the attainment of Kenya's Vision 2030's economic pillar objectives. The government should have proper monetary and fiscal policies in order to promote financial innovation in Kenya's economy for more economic reboot. Hence the

need to check regulatory restriction against institutional provision to ensure adequate innovations.

5.5 Limitation of the Study

The study may be affected by the huge variability of Kenya Gross Domestic product which was used to measure economic performance of the country. This Kenyan GDP is so unstable for accurate analysis hence need to consider a stabilization factor. The study covered a period between 2008 and 2013 when there was an explosive in mobile transaction and mobile banking in Kenya which may attribute high positive correlation hence need to have a large period such as 20 year study period to bring out a clear picture.

This research paper analysed the impact of successful financial innovation and would also be appropriate to consider further research to analyses the effect of unsuccessful financial innovation in economic growth. Such analysis would give a distinctive understanding on impact of financial innovation failure on economic growth particulars in an emerging market perspective.

The study did not control for other factors that may have been taking place within the study period and may have influenced or delimited economic growth such as labour unrest, political interest, inflation and social legal factors. This factors may have influenced the outcome of the study. The study only used interest rate as a controlling factor which maybe not adequate.

The study relied on secondary data to analyse the effect of financial innovation on economic growth. Incorporation of primary data would have given a clear view of non-

numeric data from industry captains and policy makers. Although non utilization of non-quantitative data is not believed to distort the outcome.

5.6 Suggestions for Further Research

As this study considered the relationship of only four financial innovation variables at a macro level, more research on the correlations between the performance of various financial innovations; such as products and channels and other macroeconomic factor would be to be analyzed for better results such as political unrest, interest rates, labour unrest and social cultural perspective would need to be analysed for clear results.

There also exist very little empirical literature exist on financial innovation in Kenya particular on the macro level hence more research and focus need to be targeted toward this area particularly due to its critically importance to the Kenyan economy. Hence more research in this area will open more space in financial innovation.

It would also be appropriate to consider the social value of financial innovation. Hence it's proper to consider the social expense in line with economic advancement based on financial innovation. This research case would be very appropriate for developing markets and Kenya in mind. This would look at support of local firms against foreign firms whose level of innovation and innovation adoption is different from local firms as shown by Estrin (2009) and the consequences of such innovation and related innovations.

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APPENDICES

Appendix I: RTGS, Interest Rates, Mobile Transactions, and Automated Payment Systems Outputs.

A) SPSS OUTPUT FOR ANALYSIS

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Interest Rates, RTGS, Mobile System, Cheque[b]		Enter

a. Dependent Variable: GDP

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.716[a]	.513	.484	.91107	1.002

a. Predictors: (Constant), Interest Rates, RTGS, Mobile System, Cheque

b. Dependent Variable: GDP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.572	4	14.643	17.641	.000[b]
	Residual	55.614	67	.830		
	Total	114.186	71			

a. Dependent Variable: GDP

b. Predictors: (Constant), Interest Rates, RTGS, Mobile System, Cheque

Collinearity Diagnostics[a]

Model		Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	RTGS	Cheque	Mobile System	Interest Rates
1	1	4.936	1.000	.00	.00	.00	.00	.00
	2	.056	9.398	.00	.00	.00	.30	.04
	3	.006	27.568	.01	.02	.01	.44	.64
	4	.001	67.762	.02	.12	.89	.24	.25
	5	.000	147.227	.97	.87	.09	.02	.07

a. Dependent Variable: GDP

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	10.046	5.663		1.774	.081		
	RTGS	-.064	.325	-.019	-.196	.845	.756	1.323
	Cheque	-1.892	.513	-.473	-3.687	.000	.442	2.261
	Mobile System	.712	.162	.515	4.407	.000	.533	1.876
	Interest Rates	.166	.074	.288	2.242	.028	.439	2.275

a. Dependent Variable: GDP

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.4968	5.1993	4.3028	.90827	72
Residual	-2.20262	2.28171	.00000	.88504	72
Std. Predicted Value	-3.089	.987	.000	1.000	72
Std. Residual	-2.418	2.504	.000	.971	72

a. Dependent Variable: GDP

Correlations

		GDP	RTGS	Cheque	Mobile System	Interest Rates
GDP	Pearson Correlation	1	.200	-.599**	.640**	-.333**
	Sig. (2-tailed)		.092	.000	.000	.004
	N	72	72	72	72	72
RTGS	Pearson Correlation	.200	1	-.351**	.373**	-.482**
	Sig. (2-tailed)	.092		.003	.001	.000
	N	72	72	72	72	72
Cheque	Pearson Correlation	-.599**	-.351**	1	-.644**	.687**
	Sig. (2-tailed)	.000	.003		.000	.000
	N	72	72	72	72	72
Mobile System	Pearson Correlation	.640**	.373**	-.644**	1	-.595**
	Sig. (2-tailed)	.000	.001	.000		.000
	N	72	72	72	72	72
Interest Rates	Pearson Correlation	-.333**	-.482**	.687**	-.595**	1
	Sig. (2-tailed)	.004	.000	.000	.000	
	N	72	72	72	72	72

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