

**THE IMPACT OF FINANCIAL DEVELOPMENT ON ECONOMIC GROWTH IN
KENYA**

BY

DAVID ODHIAMBO OGOLA

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SUPERVISOR: DR. BETHUEL KINYANJUI KINUTHIA

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of the Degree of Masters of Arts in Economics of the University of Nairobi**

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DECLARATION

This research paper is my original work and to the best of my knowledge, has not been submitted for the award of any degree in any university,

David Ogola

Date

This paper is submitted for the award of the degree in Master of Arts in Economics with my approval as the university supervisor.

Dr. Bethuel Kinyanjui Kinuthia

Date

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I would like to thank my supervisor Dr. Kinyanjui, my classmates for moral support and peer review. My colleagues at work for time they allowed me to have session with supervisor. My family for moral support and understanding the long hour I was absent from the house attending to the research.

DEDICATION

I dedicate this paper to my wife Nancy, My daughter Tiffany and My Son Tyron. This is for their moral support and dedication during the time I was writing the paper. I also dedicate the paper to my able and inspiring supervisor Dr. Kinyanjui Kinuthia who dedicated all his time to guide me to come up with the best paper. I also dedicate to my parents and siblings for their support.

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
CBK	Central bank of Kenya
DCBS	Domestic Credit by Banking Sector
DCPS	Domestic Credit to Private Sector
DPFB	Deposit Protection Fund Board
EG	Economic Growth
FD	Financial Development
GDP	Gross Domestic Product
IMF	International Monetary fund
M2	Broad Money
M3	Liquid Liability
NBFI	Non-Bank Financial Institutions
OLS	Ordinary Least Square
SACCOS	Savings and Credit Co-Operative Societies
VAR	Vector Auto Regressive

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ABSTRACT

The debate on the direction of causality between financial development and economic growth has received great attention from scholars. This study examined the effect of financial development (FD) on economic growth (EG) in Kenya. The paper as well investigated the direction of causality between financial development and economic growth in Kenya. In order to accomplish the above study objectives, the study used Granger causality test to determine direction of causality. To determine the effect of financial development on economic growth in the sectors, the study used Pooled OLS, Fixed Effect random effect model. The study used panel data for the period 2007 to 2015, which was obtained from the Central Bank of Kenya (CBK). The results suggest a presence of a relationship from financial development to economic growth. However, economic growth does not affect financial development directly. This implies that financial development promotes economic growth in Kenya and that policies at enhancing the development of the financial sector can help to promote economic growth. The panel study shows that financial development affects the following sectors significantly; Construction, Wholesale and Retail, Information and Communication and Finance & Insurance. In addition, the study shows that the financial development variables affected sectoral growth negatively in the year 2007, 2008 and 2011. This is because of the political temperature at the time. This implies that financial development promotes economic growth in Kenya and that policies at enhancing the financial development of the different sectors can help to promote economic growth.

CHAPTER ONE

INTRODUCTION

1.1 Background

Financial development is mainly concerned with reducing the costs incurred within the financial system. It is the process of reducing costs of information acquisition, enforcement of contracts and execution of transactions which results in the emergence of markets and intermediaries and financial contracts. Senhadji and Khan (2000) argue that if market conditions are actually less than perfect, there is costly economic exchange, and if the cost is sufficient, it may at all not occur. Financial development through financial intermediaries ensures that the exchange are affordable by eliminating market imperfections and frictions. To ensure that great financial system are in place, there must be financial sector local reforms which is the engine to ensure improvements for the extension of prosperity.

The debate on the relationship between financial development and economic growth has received great attention from empirical studies both from the advanced economies and emerging economies. The thrust of this debate is on whether financial development causes economic growth (supply leading) or economic growth causes financial development (demand leading). Unfortunately, most studies have been focusing on Latin America and Asia with Sub-Saharan Africa given little attention. There have not been so much country specific studies since most studies focuses on cross-countries study (Odhiambo 2008).

From the empirical studies, the direction of causality between financial development and economic growth has attracted a lot of debates from all quotas. The main contention is whether financial development leads to economic growth or economic growth leads to financial development. Does it mean also that both financial development and economic growth causes each other or there is no causal relationship at all since there are conflicting results (Rufael 2009)

The recent study in the world shows the magnitude of the effects of the financial crisis is still felt by both developed and emerging economies around the globe. Europe continues to be overwhelmed by debt hangover, high rate of unemployment, high political divisiveness and universal lack of competitiveness. The United States of America faces political stalemate during the uncertain fiscal time and public debt increase. The emerging market powers such

as Brazil and China are experiencing slowdown in their economies which may have significant effect for world trade (Drexter et al 2012)

The recent studies in Africa on the field of the relationship between financial development and economic growth include Abu-Bader and Abu Qarn (2008). In their study of six Middle Eastern and North African countries using a quadivariate vector auto regressive framework also provided evidence supporting finance led growth in Egypt, Morocco and Tunisia. Deogratias (2010) in his study on Rwanda for the period between the year 1964 and 2005 using the Vector Auto Regression framework got positive relationship of financial deepening on economic growth. Bali moune-Lutz (2008) got mixed results for North African Countries. However, Atindehou et al (2005) found weak causal relationship in almost all the twelve West African countries included in their study.

Recent studies in Kenya on the field of financial development include Odhiambo (2007 and 2008) where through his studies between 1968 to 2002 of Sub-Saharan African countries by using three proxies of financial development against real GDP per capita (a proxy of economic growth), he found that demand following hypothesis predominates in Kenya. He also found that the direction of causality depends on the proxies chosen for financial development. Through using a tri-variate causality model, he found that there is a causality flowing from economic growth to financial development. He said that economic growth has a positive impact on savings which intern drive the financial sector development in Kenya. Metha (2010) in his study found that Kenya's financial sector has shown some growth and while the level of GDP did not rise the financial sector has the potential to contribute more.

In the study of financial development and economic growth, few scholars have looked at the impact analysis in Kenya. There is no scholar who has looked at the panel multivariate time series in Kenya. In our study, we explored the panel analysis to investigate the impact analysis and multivariate time series to investigate the causal relationship.

1.2 Overview of financial Sector in Kenya

The Kenya Vision 2030 is a development blueprint launched in 2007. For financial services, it aims to create a vibrant and globally competitive financial sector in Kenya that will create jobs and promote high level of savings to finance Kenya's overall investment needs (Republic of Kenya, 2007). Therefore financial sector is key in promoting Economic Growth.

By the developing countries' standards, Kenya financial system is considered in the sub-Saharan Africa as the most developed (Popiel, 1994). The financial system of Kenya is made of a number of nonbank financial institutions and commercial banks. Financial Sector has received a very tremendous growth since time independent to date. From 1993 when the financial sector in Kenya comprised of 32 commercial banks, 55 Non-Bank financial institutions, 10 institutions of Development finance, 32 building societies and a big Kenya post office saving bank to Currently, when Kenya's financial sector is divided into formal and informal sectors. The formal sector comprises of banking, insurance, capital markets, pension funds, Savings and credit cooperative societies (SACCOS), development finance institutions (CBK et al., 2011). The financial sector has remained stable due to strong demand for credit and a very prudent and predictable regulatory environments.

The percentage of the population which had access to the banking services was between 20% and 40% by the year 2008 (Kimenyi and Ndungu, 2009). Currently in Africa, Kenya is second to South Africa in financial inclusion as measured by the proportion of unbanked population. 67% of the Kenyan population was banked as compared to South Africa's 79% while other countries like Tanzania (58%) Rwanda (42%) Uganda (28) (Financial Access Survey 2013)

Between 2012 and 2014, the monetary policy has been very consistent and predictable, thus enhancing strategy implementation and growth in the financial intermediation sector. Moreover, significant innovation geared towards efficiency and convenience has increased the sector's impact on economic growth and development. The banking sector has remained competitive with notable movements towards convenient banking, away from the traditional brick and mortar arrangement. By end of the year 2013, the Kenya banking sector comprised one regulator (Central bank of Kenya), forty three (43) commercial banks and One (1) mortgage finance institution. Out of 45 institutions, 31 are locally owned (3 banks with significant shareholding by the government and state corporations) and 13 foreign owned (over 50% of shareholding by foreigners). Others are 10 deposit taking institutions, 8 representatives' offices of foreign banks, 86 exchange bureaus, 14 Money Remittance providers and 3 credit reference bureaus. There is no licensed Non-Banking Financial Institutions (NBFI) and Building society in Kenya (CBK et al 2014).

In the year 1986, there was a very big bank crisis Kenya experienced where number of commercial banks and non-banking financial institutions (NBFIs) collapsed. About eight (8) institutions were merged in 1989 to form state owned consolidated bank of Kenya. The

government through the central bank then tightened their supervision when they set up Deposit protection fund board(DPFB) which guaranteed depositors up to Kenya shillings 100,000 in case a bank is being liquidated. The DPFB has now been made autonomous following signing of the central bank finance act by his Excellency the president. The government also increased initial capital to start a bank to be Kenya shillings 2 billion deposited with the central bank. In 1998, other banks like Reliance bank, Trust bank, Bulion Bank, Prudential bank collapsed because of poor management. The banks that dominated during that time were only four. They were two multinational banks i.e. Barclays Bank and Standard Chartered Bank. Others were state owned banks i.e. Kenya commercial banks and National bank of Kenya. In the year 1990s there were rapid incorporations of locally owned banks. There were further mergers and acquisitions although during this time, the local banks could not compare themselves with their foreign counter parts in terms of asset base. The government imposed restrictions on the share ownership for a single shareholder to be below 25% (Various issues by DPFB and CBK)

Several developments have taken place in the field of financial services since 2004. There were transformations of Non-banking financial institutions to fully fledged banks for those who had complied with liquidity asset and capital requirement, there were introductions of new ways of bank operations like increasing the banking hours from 3pm to 4 pm, new products developments among others. Since the banks had a lot of restrictions on account opening requirement, the savior was Equity bank in 2005. After being transformed from being a building society to a fully-fledged bank, it relaxed a lot of account opening requirements. Due to game theory, the other banks in the industry also followed suite to keep in the competition. This enhanced the financial access to the poor hence increased financial inclusion. The banks have also increased their opening days. Initially, banks used to open from Mondays to Friday. Nowadays, some banks even open half day on Sundays more so the ones operation at major malls. This made them to increase their customer base (Adopted from various websites of commercial banks)

There has been introduction of Islamic banking in Kenya. The central bank of Kenya licenced First community bank and Gulf African bank in 2007. Also authorized was introduction of shariah compliance banking product in the name of Sukus which is the Islamic bond. Some banks have also created the Islamic bank unit with the recent launched was by Kenya Commercial Bank (KCB). There has been an upward growth in mobile banking services, internet banking services and agency banking which was launched in 2010 to devolve

services close to the people. This is where businesses were allowed to be bank agents where they don't exist. As at 30 June 2014, 15 commercial banks had contracted 26750 active agents facilitating 106.1 million transactions valued at 571.5 billion in the quarter. Among banks who exploited the opportunity are: KCB as KCB Mtaani, post bank as post bank mashinani, Cooperative bank as Coop kwajirani among others. These agency banking was pioneered by equity bank (CBK Statistical bulletin, June 2014).

The financial institutions launched mobile banking. The banks link their core banking system with mobile phones after the introduction of M-PESA in 2007. This platform is operated by the Safaricom. This allowed the customers of the bank to access account balanced and transact by transferring money from their account to M-PESA account. Mobile phone money transactions were valued at 6.2 billion per day in February 2014. This has been occasioned by the competition in the industry to rope in the potential customers as much as possible. This is because most customers now prefer transacting at the comfort of their homes instead of going to the banking hall to transact. There have also been increased Auto teller Machine services in Kenya. There is increased deposit taking Micro finance institutions. They target low and middle income citizens by providing them with increased financial access and cheap credits hence impacting positively to economic growth. They also offer sound professional business management skills. They also own ATMs where withdrawals and deposits take place. Notable also is that there has been a setup of Kenswitch terminals. These are the integrated Auto teller machines. This is where the customers from a kenswitch member bank can use his/her debit card on any ATM machine of another kenswitch member bank. This has increased greater financial access. The cheque truncation project was also introduced in 2010 where the clearing process reduced to one day from 4 days (IMF statistical report 2014)

There has been a setup of credit reference bureaus where there is credit information sharing of the borrowers. From this platform, the bank knows the credit history of a customer and his /her credit worthiness as a lead to disbursing the credit facility. This has reduced drastically the non-performing loans. Some banks have also set their subsidiaries across the borders in the neighboring countries. Banks like Equity bank, KCB, CBA, NIC, CFC, COOP Bank have set up their operational offices in the neighboring countries. Some have even gone a step further and have their stocks cross listed in the foreign security exchange. Kenya Commercial bank and Equity have cross listed their shares in Uganda security exchange (USE). The most recent development in financial sector in terms of products is the introduction of M-shwari in 2012. This was a partnership between commercial bank of Africa and safaricom. This is

where the safaricom customers are allowed to access loans from commercial bank of Africa using their M-pesa transaction history. This has made commercial bank of Africa to be the largest non-listed bank in terms of customer base (Adopted from Commercial Bank of Africa website and CBK)

1.3 Overview of Economic growth in Kenya

The development of the financial sector in Kenya has shown an upward trend. This has not reflected much on the GDP as shown in the figure 1 below. The lowest being -0.8 in 1992 with the highest being 8.4% in 2010. In the early independent years, Kenya's economy grew rapidly as compared to other sub Saharan Africa. In 1992, Kenya recorded the lowest ever growth rate of -0.8%. The economy recovered again up to 1995 with 4.4% growth rate. This did not last long when the economy declines again to 0.5% in 1997. It intermittently recovered to 3.3% in 1998 but the worst again came in 2002 when the growth declined to 0.5%. There was rapid recovery when NARC government came to power and the president launched Economic recovery blue print. By 2007, there was significant increase in growth to 7%. But this was short lived when we had the growth rate reduced to 0.2% due to post election violence. There was a recovery up to 2010 when we had a record high of 8.4% growth. This decline again to 5.7% in 2013. This growth rate seems not to be following the path of growth in financial development indicators. This has informed the decision to investigate the impact of financial development on economic growth Kenya (World Bank economic indicators for various years)

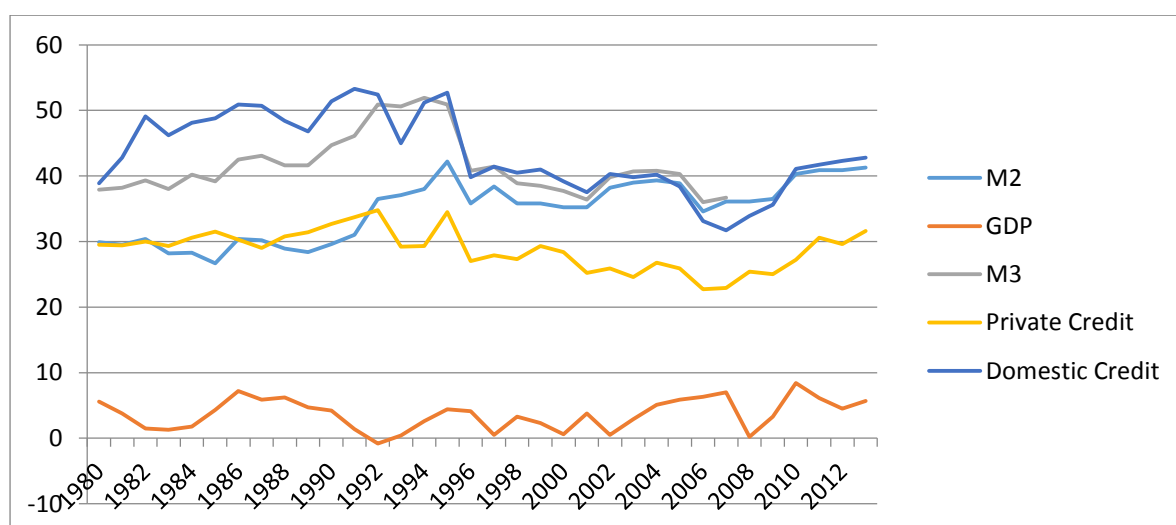


Figure 1.1: Trend of M2/GDP, M3/GDP, Private Credit/GDP, Domestic Credit/GDP and Real GDP growth rate

(Source: World Bank, www.worldbank.org)

There are several proxies or indicators of financial development. Figure 1, shows growths of M2(Broad money) as a percentage of GDP, Growth of M3(Liquid Liability) as a percentage of GDP, Domestic credit to the private sector (Private Credit) as a percentage of GDP, Domestic credit by the banking Sector (Domestic Credit) as a percentage of GDP and Kenya` economic growth(GDP) between 1980–2013. On average, growth of the financial development proxies (M2, M3, domestic credit and private Credit) are above real GDP growth over the study period. However, economic growth, as seen in the graph over the years, has been below the growth rate of the financial sector. From the above figure, there is no clear indication on the direction of causality. This is the reason for the study.

1.4 Problem statement

There have been studies focusing on the relationship between financial development and economic growth in specific countries of the world, Africa, Kenya among others. There has been conflicting result on the direction of causality. Some scholars or researchers like Christopoulos and Tsionas (2004) are on the idea that financial development leads to economic growth. On the other hand, others like Jung (1986) are proponents of economic growth leads to financial development. Other scholars are also on the idea that financial development and economic growth causes each other as postulated by Shan, Morris, sun (2001) . Some scholars like Lucas (1988) are proponents of the idea that neither financial development nor economic growth cause one another. The direction of causality depends on which country and which data used and the proxies of financial development applied. The study is important to policy makers, government and other financial sector players. Determining the direction of causality will help policy makers on where to focus in improve economic performance and financial growth. The study of financial development and economic growth is very important in Kenya since it gives a lead on the local level reforms that should be instituted to spur both financial development and economic growth.

From the figure (on page 8), there is no clear indication whether financial development leads to economic growth or it is economic growths that lead to financial development. This research paper therefore explored the direction of causality between financial development and economic growth in Kenya. Additionally, the paper explored the impact of financial development on economic growth in Kenya. There are also insufficient recent literatures that have documented the financial sector growth. This was explored through the use of Quarterly sectoral panel data over the period 2009-2015. The proxies for financial development that

were used included M3 (Broad definition of money which measure liquidity liabilities of the banking system), Domestic Credit to private sector and Domestic Credit Provided by the banking sector. On the other hand the proxy for Economic growth was Quarterly sectoral output contributions to GDP which was represented by the seven key sectors.

1.5 Objective of the study

The main objective of this study is to examine the relationship between financial development and economic growth in Kenya.

The specific objectives are:

1. To ascertain the direction of causality between financial development and economic growth in Kenya.
2. To find out the effect of financial development on economic growth in Kenya.

1.6 Scope of the study

The study focused on quarterly sectoral data through sectoral panel data and time series analysis from the year 2007 to 2015 for impact analysis and for direction of causality respectively. The study will focus seven key sectors are as per the classification in the economic survey. The sector include; Transport and communication sector, agriculture sector, wholesale and retail trade sector, manufacturing sector, hotels and restaurants sector, construction sector and financial intermediation sector.

1.7 Justification of the study

This study is very important to policy makers, government and all stake holders in the financial sectors. Once the direction of causality is determined, it is very important to understand the effect of financial development on economic growth. This will help to understand and suggest reforms in the financial sector which should be harness if it leads to economic growth or proper reforms geared towards economic growth which will spur financial development. The study of financial development is very important since it help to gain knowledge on the contributions of the financial sector to the national statistics. The information will be relevant for the key players in the industries to institute the local level reforms and policies which will help reduce the cost of acquiring information in the financial system.

1.8 Organization of the sections

Sections have been organized as follow: The second section deals with the theoretical and empirical literatures. The third section deals with methodology and estimations technique. The fourth section deals with data analysis and interpretations. The fifth and the last section deals with the summary and conclusion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical literature

From Schumpeter (1911), the theory of finance and growth was advanced. He said that the economic growth is advanced majorly through the banking channels by the financial intermediation. The financial mediation ensures allocation of capital; mobilize the savings and advancing technological changes. According to him, the financial services should only be provided by the banking system since there is advancement of technological progress. Schumpeter said that services provided by the financial intermediaries are key drivers of innovation and Economic growth.

Friedman (1959) and Johnson (1969) also did the earliest theoretical work that links the financial development and economic growth. This was by indicating that the production function contain a major element in the name of real money balance.

Samuelson (1947) and Pakinin (1965) postulated that the utility function has a greater element in the name of real money balance. From all the above, it's indicative that whenever there is a positive correlation between real money balance and the output, then the final effect will be that increase in real money balance will lead to increase in growth in real output. In this regard, it will be seen that development of the financial sectors will positively affect the economic growth of a country. Since economic growth is a subset of economic development, there will be economic development of a country. This has been demonstrated by McKinnon (1973), Shaw (1973), Galbis (1977) and Mathieson (1980) who opined that the development of financial policies has an impact on economic development. McKinnon (1973) and Shaw (1973) said that financial repression make domestic agents to hold their assets in non-monetary terms which are unproductive instead of productive monetary terms like depositing assets in the bank. This leads to less investment as there will be no money to lend in the economy. Therefore a market associated with the forces of demand and supply which is without government interferences leads to optimal savings allocation

2.2 Relationship between financial development and economic growth

There are four main types of relationships between financial development and economic growth. There is supply leading hypothesis (financial development leads to economic growth), Demand leading hypothesis (Economic growth causes financial development), Bi-

Directional hypothesis (both financial development and economic growth causes each other) and Independent relationship hypothesis (neither financial development nor economic growth causes each other).

The first one is Finance led growth (Supply leading hypothesis). This argues that financial development causes economic growth. King and Levine (1993) argue that financial institutions increase capital accumulation and also influence the productivity of the factors of Production positively. Bodie et al (2008) postulated that the major functions of financial development in stimulating economic growth are: ensuring ease of trade on goods and services, regulations, policing and ensuring corporate governance, mobilizations of savings, management and diversification of risk, access to cheaper information about potential investments and allocating capital. These contribute positively to economic growth.

The second one is Growth driven finance/ Demand leading hypothesis. Demand leading hypothesis argues that economic growth leads to increased financial development. This view is still under great debate among researchers and has not received much consensus. According to Levine (2001), economic growth may reduce the cost of accessing financial services and more people join the financial intermediaries, hence economic growth causes financial development as more financial intermediaries will be launched. This means that the factors that promote economic growth are not within the purviews of the financial sector.

The third one is Feedback/ Two-way causal relationship. Two-way causal relationship means that both financial development and economic growth causes each other in a positive way. According to Lewis (1995), a two way relationship exists between financial development and economic growth. This means that the financial sector develops because of economic growth which in turn feeds back into the system and acts as a stimulant to economic growth.

The fourth and the last one is Independent relationships. Having looked at the three relationships above, there is a fourth relationship whereby both financial development and economic growth are independent of each other. This was demonstrated by Lucas (1988). This means that factors that determine financial development and economic growth are elsewhere and not within the two.

2.3 Empirical Literature

There have been a lot of studies investigating the relationship between financial development and economic growth. The studies range from cross country to country specific, using cross-section data and some using time series data. The studies have also used various proxies for financial development and different methodologies.

In the global look, Demetriades and Andrianova (2003) studies the relationship between finance and growth in England. Their result postulated that there is a significant importance of the financial intermediaries for the achievement of economic growth. They provide the means of payment and as well provide the link between current and future consumption. They found that the liquid liability of money drive the economy. Mohd (2012) through his investigation on the causality relationship between economic growth and the developments of non-bank financial intermediaries of Malaysia between 1974 and 2004. The study showed the causality running from the non-bank financial intermediaries' development to economic growth. Choe and Moosa, (1999) in the study of South Korea about the causality between financial development and economic growth, found that financial development leads to economic growth.

In sub-Saharan Africa, Akinlo and Egbejide (2010), studied the direction of causality between financial development and economic growth of ten sub-Saharan African countries. The study found a positive relationship between economic growth and financial development. The study found bi-directional relationship in some countries. Ndebbio (2004) studied the relationship between financial development and economic growth of some Sub-Saharan countries. The proxies of financial development used were ratio of M2 to GDP and real money balances growth rate. The study found that financial development leads to economic growth. Chistopoulos and Tsionas (2004), on the study of 10 developing countries showed long-run causality running from financial development to economic growth. There was no direction of causality in the long run. Songul, Ilhan and Ali (2009) investigated between 1975 and 2005 found bidirectional causality between financial development and economic growth in sub-Saharan Africa.

In Kenya, Onuona (2014) in the study between 1980 and 2011 on empirical relationship between economic growth and financial development in Kenya, showed long-run relationship among, financial development, trade openness and economic growth in Kenya. It also finds that financial development has a significant positive effect on economic growth. Odhiambo

(2008) through the use of proxies such as broad money (M2), currency ratio and credit to private sector said that direction of causality depend on the indicators used for financial development in Kenya. Odhiambo (2002) in his study considering impact of financial reforms and savings on economic growth, found that financial development leads to economic growth. Odhiambo (2009) in his study found that financial development caused by interest rate reforms influences economic growth.

2.4 Summary of empirical literature review

Author	methodology	What they did	What they got
Abu-Bader and Abu (2008)	Time series	Relationship	Finance led growth
Akinlo and Egbetunde(2010)	Time series	Direction of causality	Demand following and Bi-directional
Atindehou(2005)	Cross section	Relationship	Weak causal relationship
Choe and Moosa (1999)	Time series	Direction of causality	Finance led growth
Christopoulos and Tsionas (2004)	Panel	Direction of causality	Unidirectional
Deogratias(2010)	Time series	Relationship	Finance led growth
Drexter(2012)	Time series	Local reforms	Local reforms leads to Economic growth
Mohd (2012)	Time series	Causality	Finance led growth
Mohsen and Maysam(2012)	Time series	Relationship	Demand following
Ndebbio (2004)	Cross section	Causality	Finance led growth
Odhiambo(2002)	Time series	Relationship	Both demand following and supply following
Odhiambo(2009)	Time series	Relationship	Supply following
Odhiambo(2008)	Cross section	Impact relationship	Impact depends on Proxy used.
Onuonga (2011)	Time series	Causality	Unidirectional
Songul, Ilhan and Ali(2009)	Panel co-integration	causality	Bi-directional effect

CHAPTER THREE

METHODOLOGY

3.1 Theoretical Framework

This study is based on the frameworks applied in the study of financial development and economic growth as conceptualized by Kabiret *al* (2011). They conceptualized their study from the neo-classical growth model by Mankiw (1995) and vector autoregressive model by Sims (1980). Neo-classical model defines growth in real GDP per capita as:

$$Growth_{i,t} = \log GDPPC_{i,t} - \log GDPPC_{i,t-1}, \quad i = \{1, 2, \dots, N\} \quad (1)$$

Where: GDPPC is the real GDP per capita; N represent the number of countries in the region (In our case the number of sectors that were considered in the study) and t indicates time. The authors said that by letting $Q_{i,0}$ to be the initial level of log (GDPPC) and Q_i^* to the long run steady state GDP per capita, the first order condition would be as below.

$$Growth_{i,t} = -\lambda(Q_{i,t} - Q_i^*) \quad (2)$$

Where; λ is a positive convergent parameter. Kabiret *al* (2011) said that the steady state GDP per capita is modeled as a linear function of structural parameters. This enabled the typical growth function to be modified and modeled as:

$$Growth_{i,t} = -\lambda Q_{i,t} + \gamma' X_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where $X_{i,t}$ is a vector of variables controlling for long-run GDP per capita across countries. Kabiret *al* (2011) used this growth model to investigate the relationship between financial development and economic growth using panel data from 168 countries from 1980 to 2007. GDP per capita was used as indicator for economic growth. The proxies for financial development used were, domestic credit to private sector (DCPS), domestic credit provided by the banking sector (DCB) and broad definition of money (M3). All the variables were measured as percentage of GDP. Other indicators that influence GDP growth were also used such as ratio of trade to GDP, gross domestic saving (GDS) and ratio of government financial consumption expenditure to GDP (GOV).

To examine the direction of causality between the two variables, this study adopted the vector autoregressive model as conceptualized by Sims (1980) and applied by Kabiret *al* (2011).

The VAR models are useful for describing the dynamic behavior of economic and financial time series.

3.2 Empirical Model Specifications and Diagnostic Testing

This study used two different models to tackle the objectives of the study exhaustively. The first study objective was to ascertain the direction of causality between financial development and economic growth. The study used vector autoregressive model for this objective. On the other hand, the second objective which was to find out the effect of financial development on economic growth, the study used ordinary least squares (OLS) regression model which gives the association between the variables of the study.

3.2.1 Multivariate Time-series model

This study used vector autoregressive (VAR) model for the multivariate time-series analysis. This model was first conceptualized by Sims (1980) in his study of macroeconomics and reality. It is useful because it is able in describing the dynamic behavior of economic and financial time series. This model is preferred in this study because it treats all variables as endogenous thus helps us to overcome the problem of endogeneity in panel data analysis.

The standard VAR model is specified as:

$$Y_t = C_0 + \sum_{s=1}^m A_s Y_{t-s} + \mu_i$$

Where, - Y_t is a 4x1 column vector of four variables

- C_0 is a 4x1 matrix of intercepts
- A_s is a 4x3 matrix of coefficients
- m is a lag length
- μ_i is a 4x1 column vector of forecast errors. The elements of this vector have zero means and constant variances and are individually serially uncorrelated.

The VAR model was estimated for the seven sectors of the economy identified for this study. After the estimation, we undertook granger causality test to determine the direction of causality between financial development and economic growth (Granger, 1969).

Panel Estimation

Under panel estimation method, the study applied the analytical framework as conceptualized by Kabiret *al* (2011). It applied the ordinary least squares (OLS) estimation method to determine the impact of financial development on economic growth. Before conducting the OLS regression, a correlation between the variables of the study was undertaken to ascertain the degree and strength of association between the variables.

The data used in this study is for seven major sectors of the economy observed overtime. Such type of data is known as panel data and there are two types of models for carrying out regression analysis with panel data, namely: fixed effects and random effects models. Fixed effects regression is used when you want to control for omitted variables that differ between the n sectors but are constant over the period of study. However, some omitted variables may be constant over the time period of study but vary between sectors. Other variables may be fixed between sectors but vary over time.

One can include both types of variables which vary between sectors and also overtime by using random effects model. Statistically, fixed effects modeling is always a reasonable thing to do with panel data because they always give consistent results such that as the sample size increases indefinitely the estimated parameters converges to its true value. It may not however be the most efficient model to run owing the fact that they have minimum variance.

Since studying the entire population was expensive and time consuming, consistency ensures that the sample being surveyed represents reality of what is taking place in the entire population while efficiency ensures that there are minimal variations between observed characteristics under investigation. Random effects will give better p-values. This increases the chances of finding various policy options that do influence economic growth. Therefore, since random effects models are more efficient estimators, one should run these models if it is statistically justifiable to do so.

In order to choose between fixed effect and random effect models, the test suggested by Hausman was conducted for model choice. The Hausman test checks a more efficient model against a less efficient but consistent one. A more efficient model was that whose estimated parameters has minimum variance and approaches the population parameters as the sample size increases. On the other hand, a less efficient but consistent model is that which always give consistent results such that as the sample size increases indefinitely the estimated parameters converges to its true value.

Based on the Kabiret *al* (2011), the general model for estimating the relationship between economic growth and financial development can be specified as;

$$g_{i,t} = \alpha_0 + \beta_i X_t + \sigma_i T_t + \varepsilon_{i,t} \quad (4)$$

Where:

- $g_{i,t}$ = Growth of sectors which measures economic growth
- α_0 = initial sectors' growth in quarter one year 2007
- β_i = Parameters to be estimated
- X_t = Variables of the study including domestic Credit to private sector (DCPS), domestic Credit provided by the banking sector (CBS) and Broad definition of money, M3 (measure liquidity liabilities of the banking system)
- σ_i = Parameters to be estimated for controlled variables
- T_t = Controlled variables

This empirical analysis used panel data on various financial development variables measures and economic growth for seven sectors of the economy for the period 2009 to 2015. In theory and based on the literature reviewed, it is postulated that the relationship between financial development and economic growth is positive.

3.3 Pre-Estimation Tests

A number of tests were conducted to give the models the proper functional and mathematical form. The first step was diagnostic test on each of the variables for stationarity using DF-GLS, KPSS, and structural break tests. A correlation analysis was also undertaken to ascertain the relationship between the regressand and the regressors.

3.4 Definition and Measurement of Variables

A number of measures have been used in various studies to represent proxies for the level of financial development ranging from interest rate to monetary aggregates, to the ratio of the size of the banking system to GDP. For purposes of this study, we used Sector GDP growth rates as a proxy for economic growth (GDP). In addition we used three variables as proxies to

measure financial development. The limitation in the number of variables is due to the availability of data for each sector.

The first proxy is domestic credit provided by the banking sector as a percentage of GDP (DCBS). When the domestic credit levels are higher, then it implies that there is reliance on the banking sector for financing. The second proxy that the study adopts is domestic credit to private sector (DCPS) as a percentage of GDP. A higher ratio of DCPS to GDP indicates that there is a high level of domestic investment as well as higher development levels of the financial system. The third proxy variable is broad definition of money (M3) which measures liquidity liabilities of the banking system in the economy.

3.5 Data Source and Collection

This study used secondary panel data for Kenya for seven key sector of the economy for the period 2007-2015 to investigate the empirical link between financial development and economic growth. The key sectors are as per the classification in the economic surveys and include; Transport and communication sector, agriculture sector, wholesale and retail trade sector, manufacturing sector, hotels and restaurants sector, construction sector, financial intermediation sector. Data was collected from publications by the Central Bank of Kenya annual statistical indicators, Ministry of Finance, Kenya National Bureau of Statistics and World Bank database.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of data analysis. This includes interpretation of the results in terms of the statistical significance of the coefficients and the direction of the relationship between the dependent and independent variables. The meanings of the relationships are also discussed and compared with the findings of other studies.

4.2 Descriptive Statistics

The summary statistics for the variables considered in the study are presented in table 4.1. Sectoral growth had a mean of 6.06 with a standard deviation of 10.71. The minimum and maximum values of sectoral growth is -25.7 and 57.0 respectively, which shows that there was huge variations in growth of the various sectors of the economy during the sample period. GDP growth had a mean of 5.01 with a low standard deviation of 2.87 which shows that it was relatively stable over the sample period. The standard deviations of M3, DCPS, DCBS, exchange rate, Interest rate and inflation rate was relatively low suggesting little variation in these variables between 2007q1 and 2015q2. The distribution of all variables, save for sector growth and exchange rate were negatively skewed. Additionally, all variables had low and positive kurtosis which suggests that their distribution is relatively flat. However, the distribution of sector growth seems to be highly peaked given its relatively high kurtosis of 10.75.

Table 4.1: Summary of variables considered

Variable	Mean	Std. deviation	Variance	Skewness	Kurtosis	Minimum	Maximum
Sector growth	6.06	10.71	114.62	-0.36	10.75	-25.70	57.00
M3	38.41	3.86	14.89	0.67	3.48	32.00	49.00
DCPS	30.21	3.28	10.74	0.54	3.13	25.00	39.00
DCBS	40.97	3.58	12.85	0.85	3.15	36.00	50.00
Exchange rate	81.00	8.73	76.27	-0.42	2.36	63.00	97.01
Interest rate	15.63	2.01	4.04	0.85	2.74	13.07	20.21
Inflation rate	8.62	5.04	25.43	0.89	2.43	2.63	19.19

4.3 Correlation Matrix

The correlations between the variables considered in the study are presented in the correlation matrix in table 4.2. M3 has a positive and low correlation with Sector growth. Similarly, DCPS has a positive and high correlations with M3 and low but negative correlation with Sector Growth. DCBS have a positive and high correlation with M3 and DCPS but low with Sector Growth. Exchange rate also has a positive and high correlations with DCBS, DCPS and M3 but low with Sectoral growth. Interest rate has Positive and high correlation with M3, DCBS and exchange rate. Interest rate also has negative and high correlations with DCPS but low with sectoral growth. On the other hand, Interest rate has positive and high correlation with M3, DCPS and Exchange rate. Inflation rate has negative and high correlation with M3, DCPS, and DCBS. Inflations as well has positive and low correlations with Sectoral Growth, Exchange rate and Interest rate.

Table 4.2: Correlation matrix

Variables	Sector growth	M3	DCPS	DCBS	Exchange rate	Interest rate	Inflation rate
Sector growth	1.00						
M3	0.04	1.00					
DCPS	-0.01	0.91	1.00				
DCBS	0.04	0.82	0.76	1.00			
Exchange rate	0.02	0.60	0.66	0.12	1.00		
Interest rate	-0.06	0.14	0.15	-0.28	0.56	1.00	
Inflation rate	0.11	-0.21	-0.10	-0.30	0.02	0.07	1.00

4.4 Unit Root Test

The unit root test results are presented in table 4.3. The DF-GLS, KPSS, and structural break tests show that the variables are non-stationary in their levels. The detailed results are presented in the appendix.

Table 4.3 Unit root test results

Variable	DF-GLS	KPSS	Structural break	
			Unit root	Optimal break
Sector Growth	-4.030(1)***	0.159 (0)*	8.221***	2010q1, 2010q4
M3	-2.514(1)***	0.187(2)*	5.78**	2009q3, 2010q3
DCPS	-1.913(1)*	0.123(3)*	3.547**	2000q1, 2014q1
DCBS	-2.306(1)***	0.131(1)*	5.406***	2009q4, 2010q3
Exchange rate	-2.729(1)***	0.13(3)*	6.326***	2008q1, 2010q4
Interest rate	-2.577(1)***	0.157(2)**	2.919***	2011q2, 2013q1
Inflation rate	-4.459(1)***	0.145(0)*	2.888***	2007q3, 2008q3

Where *, **, *** mean non-stationary at 10%, 5%, and 1% significance level. The figures in parentheses are lags

4.5 Granger Causality Test

The appropriate lag length for the VAR model used to estimate Granger causality was selected using several information criteria as shown in table 4.4. Lag 1 was chosen as the appropriate lag-length since it was selected by all information criteria, except LL and LR.

Table 4.4: selecting the lag length for the VAR model

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-269.47		16.00	0.00	972.56	18.23	18.29	18.42
1	-213.84	111.27	16.00	0.03	70.11*	15.89*	15.89*	16.52*
2	-199.99	27.69	16.00	0.51	86.27	15.73	16.27	17.41
3	-192.42	15.14	16.00	0.00	179.22	16.29	17.07	18.72
4	-172.83	39.19*	16.00		202.58	16.06	17.07	19.23

The Granger causality test results are presented in table 4.5. The causality test results show that the null hypothesis that M3, DCPS, and DCBS do not granger cause growth cannot be rejected. The results also indicate that growth does not granger cause M3, DCPS, and DCBS. This means that there are no causal relationships from growth to M3, DCPS, and DCBS. According to results, M3 granger cause Growth. Additionally, M3, DCPS, and DCBS jointly granger causes growth. The results are consistent with Mohd (2012) and Choe and Moosae,

(1999) who found Granger causality running from financial development to economic growth.

Table 4.5: Granger causality results

Ho: Excluded variable does not granger cause dependent variable				
Equation	Excluded	Chi2	df	Prob>chi2
Growth	All	9.76	3	0.02
Growth	M3	3.92	1	0.05
Growth	DCPS	1.64	1	0.20
Growth	DCBS	0.51	1	0.47
M3	Growth	0.11	1	0.74
M3	DCPS	3.42	1	0.06
M3	DCBS	0.12	1	0.73
M3	All	3.84	3	0.28
DCPS	Growth	0.04	1	0.84
DCPS	M3	1.99	1	0.16
DCPS	DCBS	0.72	1	0.40
DCPS	All	5.76	3	0.12
DCBS	Growth	0.01	1	0.94
DCBS	M3	2.32	1	0.13
DCBS	DCPS	1.71	1	0.19
DCBS	All	2.70	3	0.44

4.6: Panel Data Analysis

4.6.1 Pooled OLS Results

The pooled OLS results shows that the coefficients of all variables are not statistically significant in all model. This means that however much M3, DCBS, Exchange rate and Inflation have positive correlation with Sectoral Growth, the impacts are not significant.

Additionally, DCPS and Interest Rate have negative correlation with Sectoral Growth with no statistically significant impact on Sectoral growth.

On the other hand, all the Financial Development variables were statistically significant on the following years: Y2007, Y2008 and Y2011 at 5%, 1% and 5% significant level respectively. These Financial Development variables were also significant on the following sectors: Construction, Wholesale and Retail, Information and Communication and Finance & Insurance at 1%, 5%, 1% and 5% significant level.

4.6.2 Comparing the results of the OLS, FE and RE models

Table 4.9 shows that the results have remained the same in terms of statistical significance and sign of the coefficients in the three models.

The coefficients of all the variables are not statistically significant in all models. This means that the variables M3, DCBS, Exchange rate and Inflation that have positive correlations with sectoral growth have no significant impact on it. Additionally, the variables DCPS and Interest Rate that have negative correlations with sectoral growth have no significant impact on the same.

Table 4.7: Comparing the results of the three models

Sector Growth (Dependent variable)	Pooled OLS	Fixed Effect	Random Effect
	Coefficient	Coefficient	Coefficient
M3	0.03 (1.04)	0.03 (1.04)	0.03 (1.04)
DCPS	-0.87 (2.07)	-0.87 (2.07)	-0.87 (2.07)
DCBS	0.08 (1.81)	0.08 (1.81)	0.08 (1.81)
Exchange rate	0.29 (0.46)	0.29 (0.46)	0.29 (0.46)
Interest rate	-1.80 (1.55)	-1.80 (1.55)	-1.80 (1.55)

Inflation rate	0.58 (0.49)	0.58 (0.49)	0.58 (0.49)
Y2007	-16.94** (7.74)	-16.94** (7.74)	-16.94** (7.74)
Y2008	-31.32*** (8.47)	-31.32*** (8.47)	-31.32*** (8.47)
Y2009	-13.42 (8.51)	-13.42 (8.51)	-13.42 (8.51)
Y2010	-9.88 (8.99)	-9.88 (8.99)	-9.88 (8.99)
Y2011	-22.85** (10.62)	-22.85** (10.62)	-22.85** (10.62)
Y2012	-13.95 (13.82)	-13.95 (13.82)	-13.95 (13.82)
Y2013	-13.63 (12.91)	-13.63 (12.91)	-13.63 (12.91)
Y2014	-15.86 (13.61)	-15.86 (13.61)	-15.86 (13.61)
Y2015	-14.76 (14.48)	-14.76 (14.48)	-14.76 (14.48)
Agriculture	2.58 (3.39)	0 (Omitted)	-4.57 (3.26)
Manufacturing	3.93 (3.39)	0 (Omitted)	-3.22 (3.26)
Construction	10.46*** (3.39)	0 (Omitted)	3.31** (3.26)
Wholesale and Retail Trade	7.17** (3.39)	0 (Omitted)	0.02 (3.26)
Accommodation and restaurant	0 (Omitted)	0 (Omitted)	-7.15** (3.39)
Information and Communication	11.38*** (3.39)	0 (Omitted)	4.23 (3.26)
Finance and Insurance	7.15**	0	0

	(3.39)	(Omitted)	(Omitted)
Constant	38.64 (37.79)	44.74 (37.86)	45.79 (37.94)
Hausman test	Prob>chi2 = 1.0000		
Number of Observations	238		

*Where *** and ** mean statistically significant at 1% and 5% significance level. Figures in parentheses are standard errors*

Hausman Test

The test is not statistically significant as indicated by the P-value of 1.0000. This means that the random effect is the appropriate model. Thus, the results of the RE are adopted.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter discusses the findings presented in the previous chapter. It also presents the main conclusions of the study. The policy recommendations, as well as, recommendations for future/ further research are also presented in this chapter.

5.2. Summary

The study found that M3, DCPS, and DCBS jointly Granger cause growth. The result also indicate that M3 alone also causes Growth. This confirms the study done by Abu-Bader and Abu (2008). This result is to be expected since an increase in money supply (M3), domestic credit to the private sector, and domestic credit supplied by the banking sector leads to a decrease in the cost of financial capital. This confirms Patinkin ,D (1995) where he postulated that there is a decrease in interest rate from the cheap loans. Specifically, an increase in money supply proxied by M3 leads to a reduction in interest rates, especially in the short and medium term. This makes credit affordable to businesses and households in the economy as postulated by Bodie Z Kane et al (2008).

The resulting increase in access to loans stimulates economic growth from both the demand (consumption) and supply (production) side. From the demand side, an increase in credit enables households and firms to purchase more goods and services. This leads to an increase in aggregate demand, which in turn encourages higher production levels and economic growth. This means that an increase in credit supply increases aggregate consumption. From the supply side, an increase in credit supply enables firms or producers to access adequate financial capital to finance their production processes. Republic of Kenya (2007) says that this includes expansion of production plants and creation of new job opportunities. The

resulting increase in aggregate output leads to an increase in economic growth. In this respect, growth is expected to increase following an increase in M3, DCPS, and DCBS.

The panel result shows that the variables M3, DCBS, Exchange rate and Inflation have positive correlations with sectoral growth but have no significant effect. Additionally the variables DCPS and Interest Rate that have negative correlations with sectoral growth have no significant effect.

From the results all the Financial Development variables were statistically significant on the following years: Y2007, Y2008 and Y2011 at 5%, 1% and 5% significant level respectively.

In these particular years, the variables were negatively correlated with growth and statistically significant to the growth. This was because of the turmoil political environment.

These Financial Development variables were also significant on the following sectors: Construction, Wholesale and Retail, Information and Communication and Finance & Insurance at 1%, 5%, 1% and 5% significant level. These variables affects these listed sectors positively and statistically significant.

5.2 Conclusion

The first objective of this study was to determine the causal relationships between economic growth and financial development in Kenya. The study found that M3, DCPS, and DCBS individually do not cause growth except M3. Additionally, growth did not cause changes in these variables. However, M3, DCPS, and DCBS jointly caused growth. In this context, the study concludes that financial development, proxied by M3, DCPS, and DCBS, leads to economic growth in Kenya.

The second objective of the study was to determine the Impact of financial development on economic growth in Kenya. The study established that all variables do not have significant effect on growth.

5.3 Policy Recommendations

In light of the findings discussed in the foregoing section, the study recommends the following policies to the government to enhance economic growth. First, the cost of domestic credit to the private sector should be reduced to stimulate economic growth. This can be achieved by improving competition in the banking sector to reduce the cost of credit (interest rate). Maintaining price stability is equally important in reducing the cost of borrowing. Specifically, low inflation rates should be maintained to avoid high interest rates. This is attributed to the fact that lenders such as banks normally factor in the level of inflation in their loan pricing decisions to avoid making losses. Thus, the cost of credit normally increases as inflation rate increases. In the capital market, affordable fees should be charged to enable companies to access cheap capital by raising corporate bonds or initial public offers (IPO). Tax incentives can equally be implemented to encourage firms to raise cheap capital from the capital market. Second, maintaining a stable macroeconomic environment is also important for promoting growth of various sectors of the economy and controlling the cost of credit. Specifically, taking measures to ensure robust growth will promote savings, which in turn will boost supply of credit to the private sector through financial intermediation system. Moreover, a stable exchange rate will prevent inflation and interest rate volatility. The resulting stability in lending interest rates will facilitate steady supply of credit to the private sector, thereby ensuring rapid economic growth at sectoral and national level.

5.4 Recommendations for future studies

The study recommends further research on the effect of financial development on economic growth at sectoral level using more variables that measure financial development. Additionally, the study recommends collection of more data to facilitate cross country analysis of the effect of financial development on economic growth to provide deeper insights for policy interventions.

REFERENCES

- Agbetsiafa, D. (2004). The finance growth nexus: evidence from Sub-Saharan Africa. *Savings and Development*, 271-288.
- Akinlo, A. E., & Egbetunde, T. (2010). Financial development and economic growth: The experience of 10 Sub-saharan African Countries Revisited. *The Review of Finance and Banking*, 2(1), 17-28.
- Atindéhou, R. B., Gueyie*, J. P., & Amenounve, E. K. (2005). Financial intermediation and economic growth: evidence from Western Africa. *Applied Financial Economics*, 15(11), 777-790.
- Baliamoune-Lutz, M. (2008). Financial development and income in North Africa. *International Advances in Economic Research*, 14(4), 422-432.
- Bodie. Z. Kane, A. and Marcus. A. (2008). Essentials of Investments. McGraw –Hill International ed, 7ed, New York, USA
- Central Bank of Kenya. (Various years). *Bank Supervision Annual Report*. Nairobi: Central Bank of Kenya press
- Choe, C., & Moosa, I. A. (1999). Financial system and economic growth: the Korean experience. *World Development*, 27(6), 1069-1082.
- Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of development Economics*, 73(1), 55-74.
- Demetriades, P. O., & Andrianova, S. (2003). Finance and growth: what we know and what we need to know.
- Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of development Economics*, 51(2), 387-411.
- Deogratias, D. (2010). Financial development and economic growth: The case of Rwanda. University of Mautitius
- Drexter, M. Margareta, D.H. Darrell, D. Thierry, G. Todd, G. Isabella, R. and Neeltje, V.H. (2012). Financial Development Report. World Economic Forum

- Kenya, F. S. D. (2009). *FinAccess National Survey, 2009: Dynamics of Kenya's Changing Financial Landscape*. FSD Kenya.
- Friedman. M. and Schwartz. A.J. (1963). *A Monetary History of United States*, Princeton. Princeton University press.
- Ghirmay, T. (2004). Financial Development and Economic Growth in Sub-Saharan African Countries: Evidence from Time Series Analysis. *African Development Review*, 16(3), 415-432. Goldsmith, R. W. (1969). *Financial structure and development*. New York: Yale University press
- Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric Society*, 424-438.
- Gujurati, D. N. (2004). Basic econometric 4th edition.
- Jung, W. S. (1986). Financial development and economic growth: international evidence. *Economic Development and cultural change*, 333-346.
- Hassan, M. K., Sanchez, B., & Yu, J. S. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of economics and finance*, 51(1), 88-104.
- Schmukler, M. S. L., & Kaminsky, G. L. (2003). *Short-run pain, long-run gain: The effects of financial liberalization* (No. 3-34). International Monetary Fund.
- Khan, M. M. S., & Semlali, M. A. S. (2000). *Financial development and economic growth: an overview* (No. 0-209). International Monetary Fund.
- Kimenyi, M., & Ndung'u, N. (2009). Expanding the financial services frontier: Lessons from mobile phone banking in Kenya. *Washington, DC: Brookings Institution*, October.
- Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of economic literature*, 688-726.
- Mac Kinnon, R. (1973). *Money and Capital in Economic Development*, the Brookings Institution. *Washington, DC*.
- Metha. A.K. N. (2010). Financial development in Kenya and its impact on the level of economic growth. Unpublished research project presented to Moi University
- Islam, M. A. (2012). An empirical analysis of causality between development of non-bank financial intermediaries and the economic growth in Malaysia. *European Journal of Social Sciences*, 30(4), 654-664.

- Mehrara, M., & Musai, M. (2012). Energy consumption, financial development and economic growth: an ARDL approach for the case of Iran. *International Journal of Business and Behavioral Sciences*, 2(6), 92-99.
- Ndebbio, J. E. U. (2004). Financial deepening, economic growth and development: Evidence from selected Sub-Saharan African Countries. *African Economic Research Consortium (AERC), research Paper No.142*.
- Odedokun, M. O. (1998). Financial intermediation and economic growth in developing countries. *Journal of Economic studies*, 25(3), 203-224.
- Odhiambo, N. M. (2007). *Supply-leading versus demand-following hypothesis: empirical evidence from SSA countries*. *African Development Review* 19, 257 — 280
- Odhiambo, N. M. (2008). Financial development in Kenya: a dynamic test of the finance-led growth hypothesis. *Economic Issues*, 13(2), 21-36.
- Onuonga, S. M. (2014). Financial Development and Economic Growth in Kenya: An Empirical Analysis 1980–2011.
- Patinkin, D. (1965). *Money, interest, and prices: An integration of monetary and value theory*. New York: Harper & Row.
- Popiel, P. A., & Mundial, B. (1994). *Financial systems in Sub-Saharan Africa: A comparative study*. World Bank.
- Republic of Kenya. (2007). *Kenya Vision 2030: A Globally Competitive and Prosperous Kenya*. Nairobi: Government Printer.
- Robinson, J. (1952). The Generalization of the General Theory, in: *The Rate of Interest and Other Essays* (MacMillan, London).
- Schumpeter J. A (1911) —The theory of economic development|| Harvard University Press, Cambridge MA, USA.
- Shan, J. Z., Morris, A. G., & Sun, F. (2001). Financial Development and Economic Growth: An Egg-and-Chicken Problem?. *Review of International Economics*, 9(3), 443-454.
- Shaw, E.S. (1973), *Financial Deepening and Economic Development*, Oxford University Press, New York, NY.
- Sims Christopher A. (1980). *Macroeconomics and Reality*. *Econometrica* Vol. 48 No. 1 PP 1-48

- Acaravci, S. K., Ozturk, I., & Acaravci, A. (2009). Financial development and economic growth: literature survey and empirical evidence from sub-Saharan African countries: economics. *South African Journal of Economic and Management Sciences= Suid-Afrikaanse Tydskrif vir Ekonomiese en Bestuurswetenskappe*, 12(1), 11-27.
- Abu-Bader, S., & Abu-Qarn, A. (2005). Financial development and economic growth: time series evidence from Egypt.
- Wolde-Rufael, Y. (2008). The Revenue–Expenditure Nexus: The Experience of 13 African Countries. *African Development Review*, 20(2), 273-283..
- World Bank. (2014). *World Development Report*. New York: Oxford University Press

APPENDIX

Appendix 1: Selecting optimal lag length for the VAR

Selection-order criteria

Sample: 2008q1 - 2015q2

Number of obs = 30

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-267.98				880.59	18.132	18.1918	18.3188
1	-200.684	134.59	16	0.000	29.1758*	14.7123	15.0111*	15.6464*
2	-187.861	25.646	16	0.059	38.4257	14.9241	15.462	16.6055
3	-172.194	31.335	16	0.012	46.5265	14.9462	15.7232	17.375
4	-150.693	43.002*	16	0.000	46.315	14.5795*	15.5956	17.7556

In these results of the pre-estimation test, the likelihood ratio test and AIC selected a model with four lags whereas the FPE, HQIC and SBIC selected a model with one lag.

Appendix 2: Stationary test based on DF-GLS

Variable	Max. lag length	Conclusion
Growth	9	<ul style="list-style-type: none"> ▪ Stationary at lag 1,2, and 4 at 1% significance level ▪ Non-stationary at lags 3,5,6,7,8, and 9 at 1% ▪ Stationary at all lags at 5% and 10% significance level
M3	9	<ul style="list-style-type: none"> ▪ Non-stationary at all lags at 1%, 5%, and 10% significance level
DCPS	9	<ul style="list-style-type: none"> ▪ Non-stationary at all lags at 1%. ▪ Non-stationary for all lags except lag 9 at 5% and lags 9 and 8 at 10%
DCBS	9	<ul style="list-style-type: none"> ▪ Non-stationary at all lags at all significance levels
GDP Growth	9	<ul style="list-style-type: none"> ▪ Non-stationary at 1% significance level for lags 2,3, and 5 to 9
Exchange rate	9	<ul style="list-style-type: none"> ▪ Non-stationary at all lags at all significance levels
Interest rate	9	<ul style="list-style-type: none"> ▪ Non-stationary at all lags at all significance levels
Inflation rate	9	<ul style="list-style-type: none"> ▪ Non-stationary at lags 3 to 9 at 1% and 5% significance levels

Appendix 3: Stationary test based on KPSS

Critical values: 10% = 0.119; 5% = 0.146; 1% = 0.216			
Variable	Lag	Test statistic	Conclusion
Growth	0	0.159	Non-stationary at 10% significance level
Growth	1	0.0916	Stationary
Growth	2	0.0709	Stationary
Growth	3	0.0632	Stationary
M3	0	0.187	Non-stationary at 10%
M3	1	0.136	Non-stationary at 10%
M3	2	0.123	Non-stationary at 10%
M3	3	0.117	Stationary
DCPS	0	0.23	Non-stationary at 10%
DCPS	1	0.161	Non-stationary at 10%
DCPS	2	0.138	Non-stationary at 10%
DCPS	3	0.123	Non-stationary at 10%
DCBS	0	0.195	Non-stationary at 10%
DCBS	1	0.131	Non-stationary at 10%
DCBS	2	0.111	Stationary
DCBS	3	0.101	Stationary
GDP growth	0	0.159	Non-stationary at 10% and 5% significance levels
GDP growth	1	0.0916	Stationary
GDP growth	2	0.0709	Stationary
GDP growth	3	0.0632	Stationary
Exchange rate	0	0.291	Non-stationary at 10%, 5%, and 1% significance levels
Exchange rate	1	0.176	Non-stationary at 10% and 5% significance levels

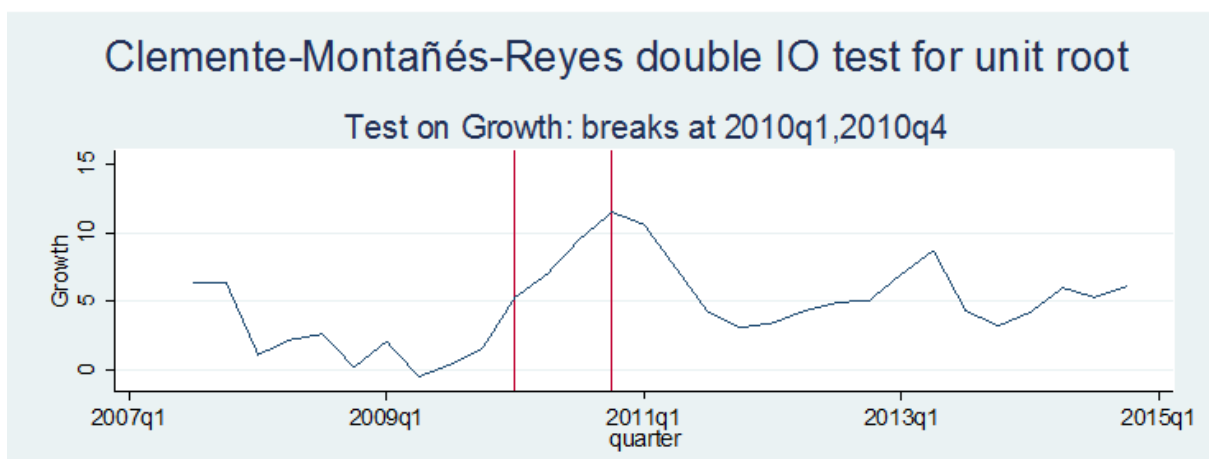
Exchange rate	2	0.143	Non-stationary at 10% significance level
Exchange rate	3	0.13	Non-stationary at 10% significance level
Interest rate	0	0.287	Non-stationary at all significance levels
Interest rate	1	0.157	Non-stationary at 10% and 5% significance levels
Interest rate	2	0.117	Stationary
Interest rate	3	0.101	Stationary
Inflation rate	0	0.145	Non-stationary at 10% significance level
Inflation rate	1	0.0803	Stationary
Inflation rate	2	0.0618	Stationary
Inflation rate	3	0.0559	Stationary

Appendix 4: Structural Break Tests

Growth

Growth T = 30 optimal breakpoints : 2010q1 , 2010q4

AR(10)	du1	du2	(rho - 1)	const
Coefficients:	8.22085	-0.29267	-2.58719	6.32269
t-statistics:	5.620	-0.221	-4.857	
P-values:	0.001	0.832	-5.490 (5% crit. value)	



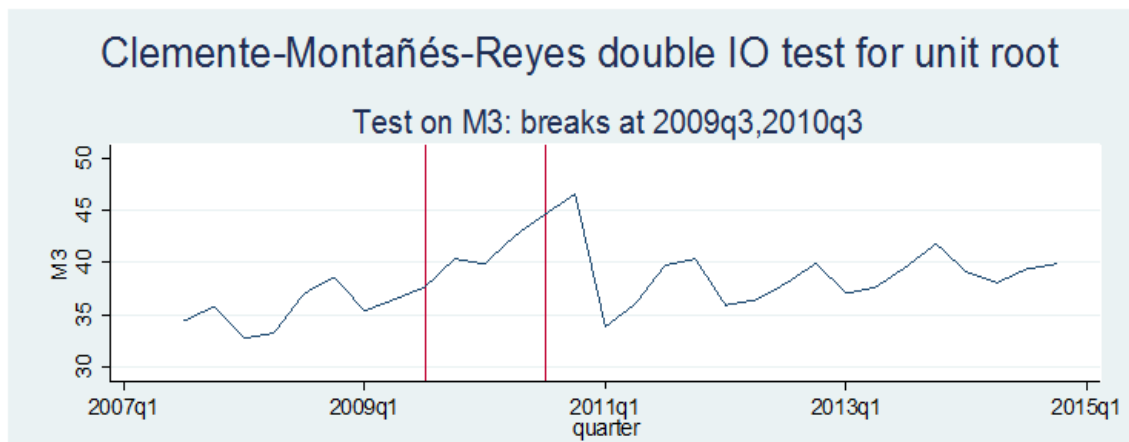
Growth is non-stationary with structural breaks in 2010q1 and 2010q4 as shown in figure 1 above. The slight reduction in the rate of economic growth in 2010q1 can be attributed to

among other factors, the slowdown in growth in the manufacturing, construction, and wholesale and retail industries.

M3

M3 T = 30 optimal breakpoints : 2009q3 , 2010q3

AR(0)	du1	du2	(rho - 1)	const
Coefficients:	5.74054	-2.86620	-0.80222	28.53172
t-statistics:	2.484	-1.545	-3.740	
P-values:	0.020	0.134	-5.490 (5% crit. value)	

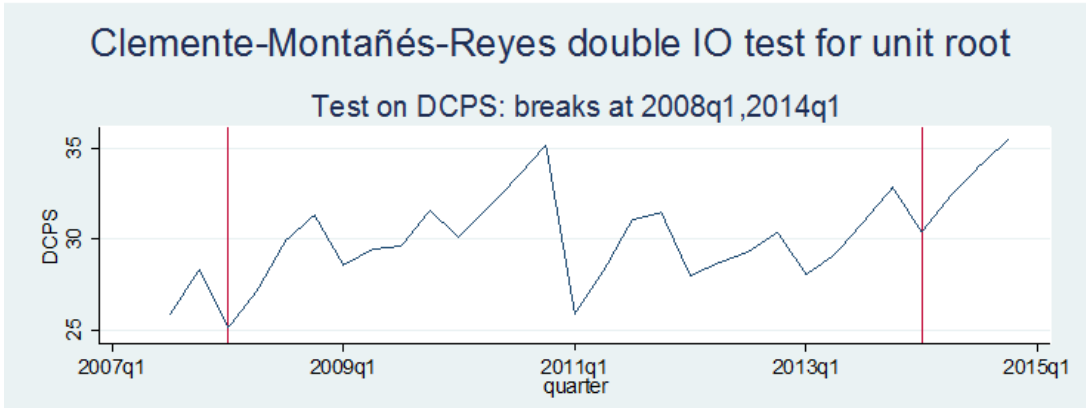


M3 is non-stationary with structural breaks in 2009q3 and 2010q3 as shown in figure 2 above. The break in 2009q3 could be attributed to sharp decline in inflation rate from 10.21 in 2009q2 to 7.5% in 2009q3.

DCPS

DCPS T = 30 optimal breakpoints : 2008q1 , 2014q1

AR(0)	du1	du2	(rho - 1)	const
Coefficients:	3.54734	5.22212	-0.82378	21.40013
t-statistics:	2.689	3.820	-4.440	
P-values:	0.012	0.001	-5.490 (5% crit. value)	

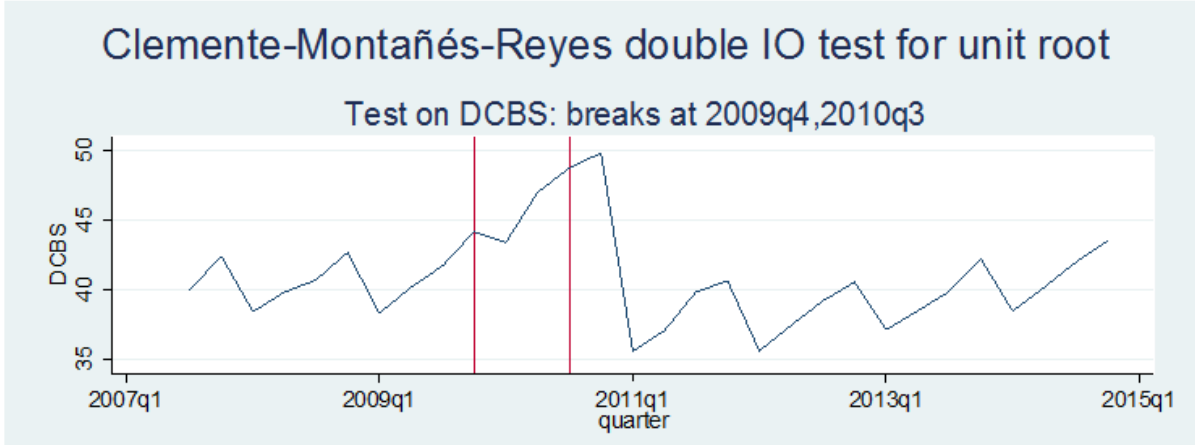


DCPS is non-stationary with structural breaks in 2008q1 and 2014q1. The break in 2008q1 is mainly explained by the 2007 post election violence that interrupted economic activities in most sectors and doubled inflation rate from 5.72% in 2007q4 to 10.63 in 2008q1.

DCBS

DCBS T = 30 optimal breakpoints : 2009q4 , 2010q3

AR(4)	du1	du2	(rho - 1)	const
Coefficients:	5.40630	-5.92560	-0.94891	38.69559
t-statistics:	2.435	-2.766	-3.874	
P-values:	0.025	0.012	-5.490 (5% crit. value)	



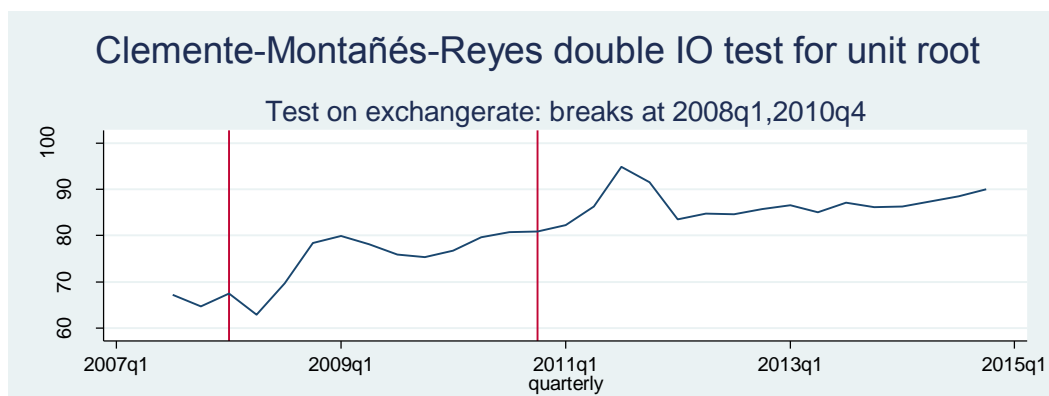
DCBS is non-stationary with structural break in 2009q4 and 2010q3. These breaks are explained by among other factors reduction in interest rates and inflation rate. Inflation rate declined from 7.5% in 2009q3 to 2009q4.

Exchange rate

Clemente-Montañés-Reyes unit-root test with double mean shifts, IO model

exchangerate T = 30 optimal breakpoints : 2008q1 , 2010q4

AR(1)	du1	du2	(rho - 1)	const
Coefficients:	6.32598	6.56133	-0.62723	42.40490
t-statistics:	3.093	3.516	-4.745	
P-values:	0.005	0.002	-5.490 (5% crit. value)	



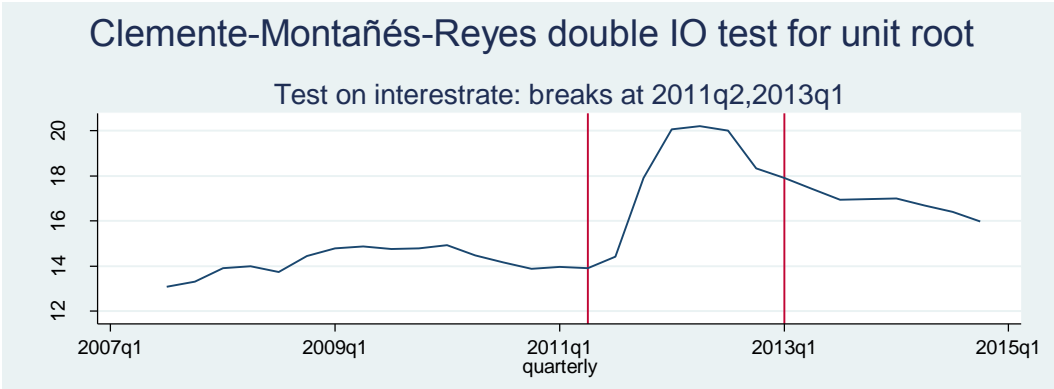
Exchange rate is non-stationary with structural break in 2008q1 and 2010q4.

Interest rate

Clemente-Montañés-Reyes unit-root test with double mean shifts, IO model

interestrates T = 30 optimal breakpoints : 2011q2 , 2013q1

AR(4)	du1	du2	(rho - 1)	const
Coefficients:	2.91852	-2.12475	-0.50772	7.30712
t-statistics:	8.453	-5.954	-5.028	
P-values:	0.000	0.000	-5.490 (5% crit. value)	



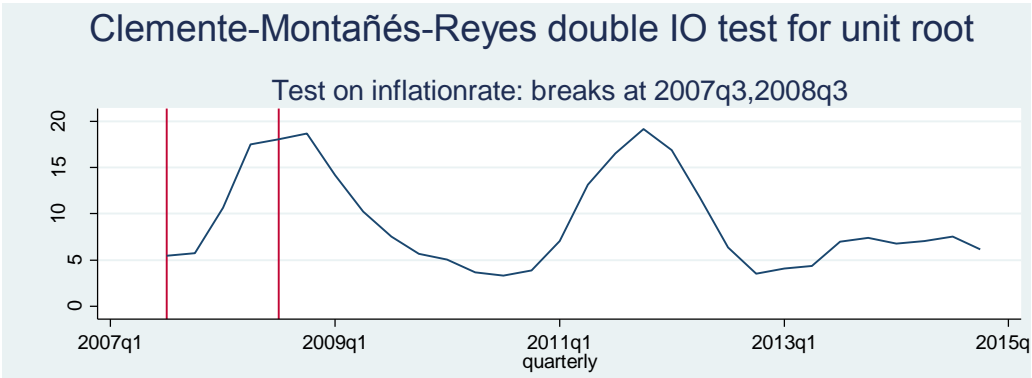
Interest rate is non-stationary with structural breaks in 2011q2 and 2013q1.

Inflation rate

Clemente-Montañés-Reyes unit-root test with double mean shifts, IO model

inflationrate T = 30 optimal breakpoints : 2007q3 , 2008q3

AR(5)	du1	du2	(rho - 1)	const
Coefficients:	0.00000	2.88824	-0.41894	0.75290
t-statistics:	.	1.527	-3.482	
P-values:	.	0.143	-5.490 (5% crit. value)	



Inflation rate is non-stationary with structural breaks in 2007q3 and 2008q3