

DECLARATION

This research paper is my original work and has not been presented for a degree award in any other University.

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APPROVAL

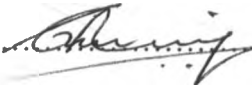
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DEDICATION

This paper is dedicated to my mum Syokau and my girlfriend Linah; the two most wonderful ladies in my life.

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ABSTRACT

The relationship between financial development and economic growth is a crucial issue for both developing and developed countries. The importance of this issue depends on the financial intermediation functions and their effects on the economic growth process. In this sense, many economists have made theoretical and empirical studies on the relationship between financial development and economic growth and the direction of this study in recent years. Therefore this study seeks to empirically explore the causal link between the level of financial development and economic growth in Kenya for the period 1967 to 2006. To achieve the objectives, both Granger-causality analysis and Error Correction Model (ECM) were applied based on the theory of cointegration.

The results of the cointegration analysis provide evidence of a stable long run relationship between economic growth and financial development in Kenya. This implies that whenever there is a shock to the system, short run adjustments occur to re-establish long run equilibrium. With respect to the direction of long run causality, the granger-causality analysis indicated that there is a bidirectional relationship running from financial development to economic growth and vice versa. Thus an increase in the level of financial development would raise real GDP while improved economic growth would trigger higher financial development.

In policy terms, the findings imply that Kenya can accelerate economic growth by improving the financial sector since financial development can be an engine of growth in this country. Financial deepening and further institutional reforms should constitute a successful strategy towards enhancing Kenya's economic performance.

CHAPTER ONE

INTRODUCTION

1.0 Background

In recent years, the relationship between financial development and economic growth has been an issue of extensive analysis, study, and debate. Whether financial development influences economic growth is a critical policy issue. A general proposition is that development of the financial sector is expected to have a positive impact on the real sector (World Bank 1994). Schumpeter (1911) underlined the role of financial intermediaries in screening investments and improving the marginal productivity of capital. Therefore the financial intermediaries increase the propensity to save, provide liquidity, and mobilize funds to most productive investments in the economy. In a recent study of the relative importance of the financial sector in promoting economic growth, Levine (2001) observed empirical evidence that countries with developed financial systems tend to grow faster.

Financial development refers to the evolution of a financial system, its structural form, modes of operation or the type of financial claims it offers (Khatkhate and Riechel, 1982). Financial development (defined as the increase in efficiency of financial system functions) is a crucial concept in economic growth literature. The financial system (which includes financial markets, intermediaries, and instruments) is concerned with channelling excess funds from those with budget surplus to those with budget deficit. An efficient financial system performs this function by mobilizing and allocating savings to most productive uses, diversifying risk, increasing liquidity, and monitoring to ensure that savings are being used well. Well functioning financial systems create productive investments and high returns, stimulating economic growth (Stiglitz, 1998).

The financial system of any country consists of specialized and non-specialized financial institutions, of organized and unorganized financial markets, and of instruments and services which facilitate transfer of funds (Masai and Mullei, 2006). Procedures and practices adopted in the markets, and financial inter-relationships are also part of the system. The different elements of the systems are not always mutually exclusive. As used here, the term 'system' implies a set of complex and closely connected institutions, agents, practices, markets, claims and liabilities in an economy. (Bhole, 1992).

Economic growth is the concept that investigates the causes of the differences in income over time and across countries. Gross National Product (GNP) is the generally accepted indicator of economic growth (Levine, 1997). An increase in GNP implies an increase in real output and an improvement in welfare. Empirically, King and Levine (1993a) show that the level of a country's financial intermediation is a good predictor of its long run rate of economic growth, capital accumulation and productivity improvement. The inevitable need to step up the growth rates of slow growing economies has recently led to most developing countries designing policy programs directed towards the restructuring of their financial sector. National policies and reforms would therefore have implications for the overall ability of financial markets to contribute to a country's sustainable economic growth and development.

Kenya's financial sector has demonstrated significant dynamism and its contribution to GDP in real terms averaged 7.8% between 1977 and 1997 and was about 10.5% in 2002, (Masai and Mullei, 2006). Apart from direct contribution to the growth of the economy, the sector plays an even greater role in facilitating the growth of other sectors. Table 1.1 shows a summary of the contribution of the financial sector to the overall GDP in Kenya since 1967 (when the Central Bank started publishing such data).

tap funds to finance government and public enterprise expenditure and to channel credit to sectors considered to be of high priority. However this perception has changed because of the following reasons;

- a) The shift in emphasis from the government to private sector as the engine of economic growth. The fact that the private sector must raise resources through the financial system, over and above the retained earnings underscores the importance of the financial system. King and Levine (1993) and Levine and Zervos (1998) noted that financial development (in general and in terms of the development of banks) had a positive and robust impact on economic growth for a group of 80 countries over the period 1960-1989. Levine and Zervos (1998) provide strong evidence of a positive and robust effect of equity market development on the growth indicators.
- b) Many financial systems in developing countries were distressed and could not provide the services required by the economies, leading to the need for restructuring, the so-called Structural Adjustment Programmes (World Bank, 1984).

Two schools of thought highlight the importance of financial development in economic growth and the causal relationship but hold contrasting perspectives. Schumpeter (1911) argued that well-functioning banking systems are able to identify innovative entrepreneurs that allow funds to be channeled to the most promising investment projects. In contrast, Robinson (1952) argues that economic growth creates demand for more financial services and thereby leads to financial development.

1.1 Research problem

Since the mid-1980s, most African countries went through an era of financial reforms partly motivated by the on-going structural adjustment programmes articulated by the World Bank and IMF, as well as efforts to step up the slow growth rates experienced in the 1970s. In most countries, the thrust of the reform agenda focused on liberalizing interest rates, deregulation of the financial sector, strengthening the banking system,

introduction of new financial instruments, and development of securities markets, especially the stock market.

Given the increasing desire for growth improvement in most African countries, development of the financial sector has attracted considerable attention from policy makers across the continent. Several studies have looked at the causal relationship between financial development and economic growth. Such studies have used pooled cross-country analysis and hence established considerable causal relationship between financial development and economic growth. Examples include: Teame (2004), Stammer (1972), and Patrick (1966). However, only a few country specific studies were carried out to test the causality between financial development and economic growth. These include Ghali (1999) in Tunisia and Thangavelu (2002) in Australia. This study, therefore, investigates the causality pattern of financial development and economic growth in Kenya over the period 1967 to 2006. The study will address the following research questions:

1. Are financial development and economic growth co-integrated?
2. Does financial development Granger-cause economic growth?

1.2 Objectives of the study

The paper attempts to empirically investigate the causal relationship between financial development and economic growth in Kenya. It will specifically seek to:

- Evaluate the relationship between financial development and economic growth using a time-series framework.
- Examine the direction of causality between financial development and economic growth.
- Suggest policy recommendations for enhancing positive interaction between the country's financial and economic development.

1.3 Significance of the study

To reduce poverty in African, different countries are currently in dire need of policy measures aimed at raising per capita income growth rates. Since the exemplary works of McKinnon (1973) and Shaw (1973), many countries in the world have come to realize the significant role of the financial sector in promoting growth. A wide range of financial reforms have been implemented in Kenya since the early 1980s. This included restructuring of the financial sector towards free market competition (Ndungu, 1997). The principal objective for such reforms as implicitly embedded in the structural adjustment programmes of the World Bank and IMF was to accelerate the slow growth that African economies experienced in the 1970s. The puzzling question, however, is: “Does the development of the financial sector in Kenya matter in terms of promoting economic growth?”

The financial sector plays an important role in Kenya’s economic growth. This contribution can be further enhanced if the linkages between financial development and economic growth are understood. There is little empirical evidence providing policymakers with information on causal patterns between the financial sector and the real sector of the economy. Thus findings from this study would be helpful to policy makers in designing and implementing policies to foster financial and economic development. The study will also update current literature and suggest areas for further study.

1.4 Scope of the study

The study aims at covering the period from 1967 to 2006. This period is important because it starts when the Central Bank of Kenya published its first annual financial sector data. Secondly the period includes the pre and post liberalization of exchange rates, interest rates and financial deregulation, all of which are expected to have influenced the performance of Kenya’s financial sector.

1.5 Organisation of the study

This study is organized into five chapters. Chapter one is the introduction and comprises the background, research problem, objectives, justification of the study and the scope and organization of the study. Chapter two provides the theoretical and empirical literature review and finally an overview of the literature. Chapter three includes the methodology, model specification and data sources. Chapter four covers empirical analysis and results while chapter five presents the conclusion, policy implications and limitations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the existing theoretical and empirical contribution to this area of study. It also attempts to relate this study to available literature. It starts with the theoretical literature then empirical literature followed by an overview of available literature.

2.1 Theoretical literature

The theoretical link between financial development and economic growth dates back to the work of Schumpeter (1911) who focused on the services provided by financial intermediaries and argued that these are essential for innovation and development. More recent theoretical developments were made by McKinnon (1973), Shaw (1973) and Fry (1995). Government restrictions on the banking system such as interest rate ceilings, high reserve requirement and direct credit programs have a negative effect on the development of the financial sector. Consequently, these reduce economic growth. Credit creation brings about economic growth due to the multiplier effect of the loan. Credit however is supposed to be unconstrained by the supply of deposits because of the existence of idle balances in the banking system and because of the possibility of borrowing from the money market or the central bank. Therefore the availability of money in the financial sector translates into credit creation to finance the economic activity and, consequently, result in higher growth.

Patrick (1966) emphasizes that, by themselves, positive correlation between financial development and economic growth are insufficient in establishing the direction of causality. Therefore the question that remains unanswered is “what is the cause and

effect”? That is, whether finance is a leading sector in the process of economic growth or it simply follows growth in real output generated elsewhere. (Ghali, 1999).

Gurley and Shaw (1967) point out that economic development not only concerns the goods sector but also the financial sector. They see economic development as being accompanied by institutionalization of savings and investment which diversifies the channels for the flow of loanable funds and multiple varieties of financial services. Without any empirical evidence they accept the existence of a two way causality effect between financial development and economic growth. Nevertheless, they point out that economic development is retarded if financial intermediaries do not evolve.

John Hicks (1969) studied the development of the financial system in England and evaluated the Renaissance as a period in which not only the use of money increased but also money began to link up with credit and finance and argued that financial development is based on the need for widening the circle of credit worthy borrowers. Thus, financial system enhances economic growth through promoting the discovery of new opportunities for investment, and so contributes to the development process of a modern industry, which is the key factor for the Industrial Revolution.

The efficiency of financial institutions and markets in promoting financial deepening and savings mobilization has been recognized by policy makers and economists such as Ronald McKinnon (1973) and Edward Shaw (1973). McKinnon postulates that an increase in holding financial assets (financial deepening) by the private sector promotes savings mobilization which leads to higher levels of savings, investment, production and growth. Developing countries' financial systems were said to be characterized by unsound financial institutions with the absence of prudent regulations and supervision; uncompetitive financial markets with a few commercial banks dominating the sector and existence of informal financing. Interest rates were set administratively to accommodate government borrowing. The Central bank served to finance government deficits, conduct foreign exchange transactions for the government and ensure that institutions do not enter into liquidity problems. Due to these factors, developing countries' financial systems were said to be financially repressed.

The concept of financial repression was popularized by McKinnon (1973) and Shaw (1973), to describe financial systems with policies that distort domestic financial markets, including inflexible interest rates, higher reserve requirements (that allowed the government to borrow at low costs) and credit controls. Kenya experienced this before interest rates were liberalized in 1991 (Masai and Mullei, 2006). A repressed financial system interferes with economic development as the intermediaries are not well developed for mobilizing savings, while the allocation of the financial resources among competing uses is inefficient. Developing countries operated with low interest rates aimed at increasing the level of investment, improving the allocation of resources among sectors and keeping financial costs down to avoid inflationary pressure. This supported the liquidity theory of interest rates in which Keynes and McKinnon (1973) and Shaw (1973) argued that real interest rates kept below the market equilibrium increased the demand for investment but not the actual investment. Low interest rates are insufficient to generate savings, and even reduce savings especially if substitution effects dominate the income effects of households. (Masai and Mullei, 2006).

Patrick (1966) argues that financial development leads to economic growth and that financial development in turn, is enhanced by economic growth. He terms this type of relationship as “demand-following” and “supply-leading phenomenon”. The former arises when growth in the real sector leads to growth in the financial sector. Here investors and savers demand for financial services which lead to establishment of financial institutions and growth in their assets and liabilities plus innovations in the services offered. This also increases efficiency of investments as investment rationing where funds (indirect finances) are channeled through financial institutions to viable and faster growing enterprises. The supply-leading phenomenon, on the other hand, arises when development in the financial sector leads to growth in the real sector. The situation occurs when the establishment of financial institutions and the supply of their financial assets and liabilities, and related financial services lead to growth in the real sector. This implies that resources are transferred from the traditional (or informal) sector to a more efficient formal sector, given the prevalence of a free market economic environment. The

supply-leading financial response is evident in a young economy where sustained modern industrial growth has not yet been achieved. The assertions on supply-leading and demand-following phenomena were however not based on any empirical evidence.

Moreover, it is argued that the effectiveness of financial intermediaries and markets in promoting economic growth depends on the institutions set up to implement financial transactions. For example, LaPorta et al. (1998) found out that the legal system plays a crucial role in determining the financial development and growth relationships. They argue that secure property and contract rights is key for banks and financial institutions to work properly, while weak contract enforcement creates incentives for default by debtors and decreases willingness to lend.

According to Teame Ghirmay (2004), there are those who argue that financial development is an essential element for economic growth and development and emphasize that the financial system through its capacity to acquire and process information effectively increases the level of investment and enhances the allocative efficiency of investment. On the other hand, there are those who regard financial development either as the handmaiden to industry and commerce or as a relatively unimportant factor. According to this perspective, economic development creates demands for particular types of financial services and the financial system simply responds to these demands. With regard to the second issue, disagreements exist on the nature of the effect. While some show that the link works mainly through improved efficiency of investment others argue that the link works mainly by increasing savings and investment, and still others show that it works through both channels.

From theoretical perspective, economists including Levine & Zervos (1998), McKinnon (1973) and Shaw (1973) have argued that more developed financial systems promote or 'lead' economic growth because they assist in mobilising savings and facilitate investment. In addition, financial development may increase economic growth rates by helping to improve the marginal productivity of capital and increasing the proportion of savings allocated to investment. Others (including Robinson, 1962; Stiglitz, 1998) have questioned the importance of the financial system in promoting economic growth. They

proposed that economic growth creates additional demands for financial services, which may bring about more developed financial sectors. This debate has important policy implications for developed and developing countries. Levine (1997) noted that evidence concerning the causality between financial development and economic growth could assist governments to determine what priority should be given to financial sectors reforms.

The existence of a stock market eliminates liquidity and productivity risks of investments, and stimulates economic growth through this financial intermediation function. Levine (1997) found out that taxes associated with stock market transactions reduce the amount of investment in firms and increase the premature liquidation of firm investments, both of which slow the rate of economic growth. Levine (1997) regards the link between finance and growth to be advanced enough to draw relatively firm conclusions. He also cites evidence that economic growth generates financial intermediation which in turn promotes growth, thus proposing that financial development and economic growth are jointly determined.

2.2 Empirical literature

An extensive amount of empirical investigations have been conducted, aimed at testing the conflicting theoretical developments above using different techniques. These empirical investigations can be classified into two major groups. The first group consists of those that use cross-country growth regression methods in which the average growth rate of per capita output over some period is regressed on some measure of financial development and a set of control variables (King and Levine, 1993a; Levine and Zervos, 1998; Ndikumana, 2000). The second group consists of those that use time series data of individual countries to investigate the causal relationship between the two variables (e.g. Ghali, 1999 for Tunisia and Thangavelu, 2002 for Australia). The problem with the pure cross-country studies is well documented in the literature. In particular, according to Thangavelu (2002) the method fails to explicitly address the potential biases induced by endogeneity of the explanatory variables and the existence of cross-country heterogeneity. These problems may lead to inconsistent and misleading estimates.

Recognition of the methodological weaknesses of the cross-country regression analysis has prompted researchers to use time series data of individual countries to investigate the causal links between financial development and economic growth. In contrast to the cross-country studies, time series methods can provide useful insights into differences of this relationship across countries and may illuminate important details often hidden in averaged-out results (Arestis et al., 2001).

Studies that examine the causality between financial development and economic growth take two broad econometric approaches. Gelb (1989), Fry (1995) King and Levine (1993) Levine (1997) Rajan & Zingales (1998) and Levine & Zervos (1998) have used national cross-sectional data to model the relationship between financial development and economic growth. These studies tend to support the hypothesis that the causality runs from financial development to economic growth. In recent years, however, several studies have used time-series modelling frameworks. Arestis & Demetriades (1997) noted that cross-sectional analysis implicitly assumes that countries share similar economic structures, populations and technologies and this is simply not true. Demetriades & Hussein (1996) argued that causality patterns vary across countries and, therefore, highlight the dangers of statistical inference based on cross-country studies. The most serious criticism of cross-sectional studies is that they are unable to examine causality in the Granger sense. Unlike cross-sectional analysis, time-series analysis makes it possible to examine lagged relationships between variables. Demetriades & Hussein (1996) summed up the case against the cross-sectional approach to testing causality in the following way. First, it is not possible to infer anything more than a contemporaneous correlation between growth and financial development. Second, they do not allow different countries to exhibit different patterns of causality. Third, any causality identified is 'on average' across different countries and this is sensitive to the addition or deletion of a few observations.

A growing body of empirical analysis, including individual country-studies, and broad cross country comparisons, demonstrate a strong positive link between the functioning of the financial system and long-run economic growth. Theory and evidence make it difficult to conclude that the financial system merely and automatically responds to

industrialization and economic activity, or that financial development is an inconsequential addendum to the process of economic growth. Undoubtedly, the financial system is shaped by non-financial developments. Changes in telecommunications, information communication technology (ICT), non-financial sector policies, institutions, and economic growth itself influence the quality of financial services and the structure of the financial system. Technological improvements lower transaction costs and affect financial arrangements (Levine 1997). Monetary and fiscal policies affect the taxation of financial intermediaries and the provision of financial services (Bencivenga and Smith, 1991; Roubini and Sala-i-Martin, 1992). Legal systems affect financial systems (LaPorta et al. 1998) and political changes and national institutions critically influence financial development.

Using empirical evidence from Hong Kong, Stammer (1972) analyses to find out whether a country's financial system can be a leading sector in its economic development. He refutes Patrick's (1966) view that the financial sector can perform a supply-leading role in the early stages of economic development. Experience from Hong Kong suggests that economic development once underway can, to a considerable extent, be self-financing. The findings suggest that there could be no need to work towards increasing savings rates in developing countries, as the initiated development can, to some extent be left to finance itself and that governments in such developments should better use scarce resources to finance other sectors rather than the financial sector. He argues that, given a favourable environment and a certain stage in the economic development process, development finance may be a more useful substitute for external finance through the financial intermediaries than is usually thought to be the case.

According to Al-Yousif, Yousif Khalifa (2002), the first empirical study on the causal relationship between financial development and economic growth is by Raymond W. Goldsmith titled "*Financial Structure and Development*", 1969. Goldsmith relates financial development to the size of the financial system, and so his empirical study contains 35 tables, each of which shows the amount of total assets of all important types of financial institutions in one country, in order to represent financial development; and a table, which shows the GNP levels of the same 35 countries at current prices, in order to

represent economic growth. Time period of this study is from 1860 to 1963. As a result of his empirical study Goldsmith suggests that, the separation of the saving and investment functions and the enlargement of the range of financial assets increase the rate of growth through the channels of increasing the efficiency of investment and raising the ratio of capital formation to national product. According to Levine (1997), the weaknesses of this study are the limited observations on only 35 countries, other factors influencing economic growth which are not controlled systematically, and the possibility that the size of the financial intermediaries may not be an accurate measure of financial development.

Ghali, (1999) uses two alternative measures of financial development, the ratio of bank deposit liabilities to nominal GDP (DL) and the ratio of bank claims on the private sector to nominal GDP (CL). The first measure excludes currency in circulation from the broad money stock and the second is a more direct measure of financial intermediation. Both financial measures are indicative of the stage of financial development and an increase in these ratios could be interpreted as financial deepening. Following the standard practice (King and Levine, 1993), the proxy used for economic growth is real GDP per capita. Ghali, (1999) used annual series data for Tunisia over the period 1963-93. The dynamic interactions among the per capita output growth and financial development are investigated using the concept of Granger-causality test (According to Johnston and Dinardo, 1997; this is a test of whether a specific variable or group of variables plays any role in determination of other variables in a Vector Auto regression.) after testing for cointegration using the Johansen methodology (Johansen S., 1992). The empirical results suggest the existence of a stable long-run relationship between each financial development ratio and the per capita output which is consistent with causality running from financial development to economic growth. The short-run changes and the long-run movements in both financial ratios are found to have significant contributions to economic growth. As far as policy is concerned, financial deepening and further institutional reforms should constitute a successful strategy towards enhancing economic performance.

Teame Ghirmay (2004) studied the causal link between financial development and economic growth in a sample of 13 sub-Saharan African countries. These countries are:

Benin, Cameroon, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Rwanda, South Africa, Tanzania, Togo, and Zambia. The choice of the sample countries was dictated by the availability of long-term time series data. The data frequency is annual and the time span ranges at least 30 years. Economic growth is measured by an increase in real GDP (Y), and financial development is represented by the level of credit to the private sector by the financial intermediaries. The finding of long-run relationships between economic growth and financial development in most of the countries studied is consistent with the view expressed in the finance and growth literature. On the other hand it does not provide clear evidence in the direction of causality in either way. The finding that financial development had a long-run causal effect on economic growth in 8 of the 13 countries (six of them bidirectional) shows that in low-income African countries, financial development causes economic growth and suggests the need to expand and improve the efficiency of the financial system through appropriate regulatory and policy reforms in order to promote faster economic growth.

Odedokun (1996) empirically examined the relationship between financial development and economic growth in Northern Cyprus. He used the ratio of demand deposits and private sector credit to GDP as a proxy to measure financial development and found out that there was a positive but negligible effect of financial development on economic growth. However he found out that there is evidence of causality from economic growth to development of financial intermediaries. The specification of the model used is as follows;

$$GY = \beta_0 + \beta_1(GL) + \beta_2(GX) + \beta_3(IY) + \beta_4(DEP) + \beta_5(LOA)$$

Where,

- GY = annual growth rate of real GDP
- GL = annual population growth
- GX = annual growth of export
- IY = the ratio of domestic investments to GDP
- DEP = the ratio of deposits to GDP
- LOA = the ratio of loans to GDP

From above, DEP and LOA are the financial development variables. The following are the specific ways the variables were computed;

- (a) Economic growth was measured as the annual growth rate of the real GDP
- (b) Labour force growth was proxied by population growth which was in turn calculated as the annual growth rate of the population size.
- (c) The investment-GDP ratio was computed as gross nominal fixed capital formation plus the increase in nominal stocks both divided by the nominal GDP.
- (d) Real export growth was calculated as the annual growth rate of real exports of goods and non-factor services.
- (e) The ratio of deposits was computed by dividing all bank deposits by GDP.
- (f) The ratio of loans was computed by dividing total bank credit to private sector by GDP.

The effect of financial development on economic growth is expected to be positive and significant. This shows that financial intermediation is an important promoter of economic growth. The other three growth-determining factors considered in this study are: real exports, share of capital formation in the GDP and labour force growth. These are all expected to have a positive effect on economic growth. We then compare the respective positive effects of these factors that have often been emphasized in economic literature as important growth-promoters with that of financial intermediation.

The empirical literature on the issue of Granger-causality between financial development and economic growth remains however, very limited by the scarcity of long time series on national accounts data, especially in developing countries (Ghali, 1999). Demetriades and Hussein (1996) have shown evidence that the issue is very much country-specific, which joins the views expressed by the World Bank (1993) that economic policies are country-specific and their effectiveness depends on the effectiveness of the institutions which implement them.

2.3 Kenya: A specific literature

By the year 2006, Kenya's financial system comprised of 42 commercial banks and other institutions as shown in Table 2.1 below. The system is a significant contributor to the performance of Kenya's economy. In 2002 it contributed about 10.5% of GDP. Apart from the direct contribution to the growth of the economy, the sector plays an even greater role in facilitating the growth of other sectors of the economy. Recognizing this catalytic role, the government of Kenya has sought to influence or regulate its development to achieve various development objectives. Total assets of the banking system were around 45% of GDP at end of 2002, while bank credit to private sector was 27% of GDP, while credit to government was 11% of GDP (Masai and Mullei, 2006).

Table 2.1: Kenya's Financial Sector Institutions (1997 and 2006)

| Financial sector institution | Number as at 2006 | Number as at 1997 |
|-------------------------------------|--------------------------|--------------------------|
| Central bank | 1 | 1 |
| Commercial banks | 42 | 53 |
| Non- banking financial institutions | 2 | 16 |
| Forex Bureaus | 178 | 40 |
| Building societies | 2 | 4 |
| Mortgage finance institutions | 2 | 2 |
| Stock exchange | 1 | 1 |
| SACCOs | 4474 | 2670 |
| Insurance companies | 41 | 39 |
| Micro-finance institutions | 19 | 6 |
| Development finance institutions | 9 | 10 |

Source: Central Bank of Kenya Statistical Abstracts; (1996 to 2006)

There are several studies on Kenya's financial sector. However, such studies do not address the causality pattern between financial development and economic growth. Some give a descriptive evolution of the financial system while others analyze financial sector

A secondary market trading in long-term securities was operated by a private association of some brokerage firms, formed in 1954 under the Kenya Cooperative Societies Act, which is now the Nairobi Stock Exchange (NSE). For a long time, until 1989, the stock exchange had no physical trading floor and was not regulated by specific securities legislation or a securities commission. The stock exchange operated according to rules and regulations adopted by the members in 1954 and amended in 1981. It was against this background that the government with the help of the World Bank undertook financial sector reforms under the package of structural adjustment

The period 1990–2002

One particular turn of events in the 1990s was the slowdown in economic growth and the rapid rise of the rate of inflation, money supply growth and interest rates. Money supply to GDP ratio has been growing quite steadily, rising from 29.7% in 1990 to over 41% in 1994. Private sector real credit growth has been negative in some years. The real growth of national output declined drastically in the 1992/93 period, but there was marked improvement in the 1994/95 period. In 1994 real GDP growth increased to 3% from 0.2% in 1993.

The ensuing legislative reform measures had little impact since even though the technical capacity of the supervisory department of CBK was improved, political forces weakened enforcement. It was estimated that 11 banks and 20 Non-banking financial institutions were in financial distress in 1992 (Swamy, 1994). Even without the preconditions, the liberalization required an increase of the supply of credit to relax credit constraints and there was also a shortage of high yielding investment opportunities. The liberalized interest rates did not become “market-determined” and were negative in real terms in 1992 (World Bank, 1994). The major reasons for this outcome were the government’s failure to allow and encourage a secondary market for its long-term bonds to develop and the existence of pervasive controls on foreign exchange transactions. The rate of inflation had been above the nominal interest rates in most years.

This was exacerbated by a strong rise in consumer demand due to excess liquidity in the economy and accompanied by increased spending in the run-up to the 1992 elections.

Besides all these factors, money supply was being expanded by the indirect effects of the aid embargo at the time, due to the escalating fiscal deficit, which inevitably had to be financed by printing money.

Kimura et al. (2003) summarises up the various events that together contributed to the difficulties in this sector as follows; the liberalisation of the financial market in June 1991, the extreme monetary expansion and inflation episode after the 1992 multi-party elections and the high interest rates that arose to mop up the excess liquidity at that time (1993-1994).

The period 2002 to-date

Currently, the financial system in Kenya is well developed. It is contributing about 10% on average to overall GDP annually and plays an even greater catalytic role by facilitating growth of other sectors of the economy. Total assets of the banking system, for example were 45% of GDP at the end of 2002, while bank credit to the private sector was 27% of GDP in 2003. (Masai and Mullei, 2006).

The financial sector remained stable, mainly due to favourable macroeconomic conditions prevailing during the review period. Non-performing loans and advances net of provisions continued to decline while gross loans and advances increased leading to better asset quality and improved profitability. The banking sector has witnessed stiff competition forcing banks to re-package their services and products to satisfy the needs of the customers and retain their market share. Institutions are therefore increasingly offering e-banking services for both residents and non-residents. Islamic banking has emerged as a new market product. In response to this, some of the institutions have redefined their business strategies while leveraging on innovative and affordable products to capture this new market segment. In the long run, the success and soundness of the financial institutions and the entire sector will depend on the achievement of operational efficiency through the application of prudential practices, good corporate governance and robust risk management frameworks (Central Bank of Kenya; Annual Statistical Abstract, 2006).

The Nairobi Stock Exchange has introduced the bond yield curve which shows the relationship between returns and maturity dates for asset of similar bonds at a given point in time. This has been in response to the increased number of bonds floated on the stock exchange in the recent past. Examples of these are Barclays bank's five billion Kenya shillings corporate bond, Sasini tea and coffee; six hundred million Kenya shillings bond and Athi River mining; three billion Kenya shillings bond, among others. (The East African Standard, 8th July 2008).

2.4 Overview of the literature

The studies reviewed reveal contrasting views on the causality between financial development and economic growth. From theoretical perspective, some economists have argued that more developed financial systems promote or 'lead' economic growth because they assist in mobilising savings and facilitating investment (Shaw, 1973; McKinnon, 1973; Levine and Zervos, 1998). In addition, financial development may increase economic growth rates by helping to improve the marginal productivity of capital and increasing the proportion of savings allocated to investment. Others have questioned the importance of the financial system in promoting economic growth (Robinson, 1962; Stiglitz, 1998). They contend that economic growth creates additional demands for financial services, which in turn may bring about more developed financial sectors. It clearly shows that the relationship between financial development and economic growth is still ambiguous and country specific (Levine, 1997; Ghali, 1999; Thangavelu, 2002).

The studies on Kenya have stressed the importance of the financial sector in the country's economic growth without necessarily unveiling the causality relationship between financial development and economic growth. Some present a descriptive evolution of the financial sector (Mullei and Ng'elu 1990; Kimura et al. 2003). Others have analyzed the financial sector liberalization (Ngugi and Kabubo, 1998; Ndungu, 1997; Mwege et al., 1990). Yet others have looked at the financial sector as a whole (Masai and Mullei, 2006; Kimura et al., 2003). This study attempts to fill in this knowledge gap by attempting to

investigate the causality pattern between financial development and economic growth for Kenya's economy over the period 1967 to 2006.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter provides the theoretical and methodological framework used to analyse the data and provide direction to attain the set objectives. It gives an outline of the theoretical model used and various tests performed to ascertain the validity of data and robustness of the model including stationarity, cointegration, correlation analysis and diagnostic tests.

3.1 Empirical model

The study uses Granger causality test to estimate the relationship. This is the common methodology in various studies (Ghali, 1999). The basic principle of Granger-causality analysis is to test whether or not lagged values of one variable help to improve the explanation of another variable from its own past. The Granger (1988) approach to the question of whether χ Granger-causes γ is to see how much of the current γ can be explained by past values of γ and then to see whether adding lagged values of χ can improve the explanation. γ is said to be Granger-caused by χ if χ helps in the prediction of γ , or equivalently if the coefficients on the lagged χ 's are statistically significant. Note that two-way causation is frequently the case; χ Granger causes γ and γ Granger χ causes. It is important to note that the statement “ χ Granger causes γ ” does not imply that γ is the effect or the result of χ . It is important to handle the causality testing with care because both financial development and economic growth can be driven by a common variable, such as propensity of households to save (Rajan and Zingales, 1998).

The findings that many macroeconomic time series may contain a unit root has spurred interest in non-stationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are said to be

cointegrated. This stationary linear combination may be interpreted as a long-run equilibrium relationship.

Cointegration is a special class of integrated series whose dynamic characteristic reflects a systematic (non-spurious) relationship. Some pairs of data tend to move closely and systematically over time (e.g., consumption and income, inflation and nominal interest). What cointegration does is to represent the statistical characterisation of this relationship (equilibrium relationship). Cointegration allows us to capture the equilibrium relationship between non-stationary series within a stationary model. It's a method of avoiding spurious and inconsistent regression problems which occur with regression of non-stationary series.

Given the series

$$\gamma_t = \alpha\gamma_{t-1} + \mu_t \tag{1}$$

where $\mu_t \approx N(0, \delta)$ (2)

Testing the order of integration is equal to testing the coefficient of α

If $|\alpha| < 1$, then the series is stationary.

If $|\alpha| \geq 1$, then the series is non-stationary.

The hypothesis is as follows:

H_0 : $\alpha = 1$, and implies the series is non-stationary.

H_1 : $\alpha < 1$, and implies the series is stationary.

We use the Augmented Dickey-Fuller test to test for the order of integration. In cases where we have a linear combination of variables which are integrated of order one, we expect that the linear combination of the residuals from the two regression variables to be stationary. The test for cointegration is based on the linear combination of the residuals of the co-integration series.

Given,

$$y_t = \beta x_t + \varepsilon_t \quad (3)$$

$$\text{where } y_t \approx I(1), \quad x_t \approx I(1) \quad (4)$$

If there is co-integration then the residual from the above regression should be stationary i.e., $\varepsilon_t \approx I(0)$

We therefore conduct unit root test on ε_t

$H_0: \rho = 0$, implies no cointegration (stationary series)

$H_1: \rho < 0$, implies cointegration (stationary series)

If there is cointegration, there should be Granger-causality in at least one direction. (Engel and Granger, 1987).

Given a vector auto regression (VAR)

$$y_t = a(L)y_{t-1} + b(L)w_{t-1} + \delta_t \quad (5)$$

$$w_t = c(L)y_{t-1} + d(L)w_{t-1} + v_t$$

w_t does not Granger-cause y_t if $b(L) = 0$

We specify the k^{th} order VAR as follows:

$$x_{1t} = \mu_1 + \pi_{11}(L)x_{1t-1} + \pi_{12}(L)x_{2t-1} + \varepsilon_{1t} \quad (6)$$

$$x_{2t} = \mu_2 + \pi_{21}(L)x_{1t-1} + \pi_{22}(L)x_{2t-1} + \varepsilon_{2t} \quad (7)$$

where μ_1 and μ_2 are constant drifts and $\pi_{ij}(L)$ are polynomials of order $k-1$ in the lag operator L .

Following Granger (1963), x_{1t} Granger- cause x_{2t} if $E(x_{2t+1} / I_t) \neq E(x_{2t+1} / I_t^1)$, where I_t is the set containing all available information and I_t^1 excludes present and past information on x_{1t} .

In terms of the system defined above, x_{2t} Granger-causes x_{1t} when $\pi_{12}(L)$ is different from zero and similarly x_{1t} Granger-causes x_{2t} when polynomial $\pi_{21}(L)$ is not equal to zero.

We then re-parameterized the model in its equivalent error-correction model (ECM) form which will contain the short and long-run effects. This restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

Given the long-run equation $\gamma_t = \beta\chi_t + \varepsilon_t$, the ECM formulation of the dynamic model

$$\gamma_t = \alpha_0 + \gamma_0 \chi_{t-1} \alpha_1 \gamma_{t-1} + \mu_t \quad (8)$$

$$\text{may be reparameterised as } \Delta\gamma_t = \gamma_0 \Delta\chi_t - (1 - \alpha)[\gamma_{t-1} - \beta\chi_{t-1}] + \mu_t, \alpha_1 < 1 \quad (9)$$

Long-run equilibrium is incorporated in $\mu_t = \gamma_{t-1} - \beta\chi_{t-1}$ (the lagged residual). When equilibrium holds $\mu_t = \gamma_{t-1} - \beta\chi_{t-1} = 0$ and during periods of disequilibrium, it measures the deviation away from the equilibrium.

Real GDP per capita is the proxy used to measure economic growth in most studies (King and Levine, 1993). The selection of key variables to indicate and measure the level of financial development is the major problem in many empirical studies. Construction of financial development indicators is an extremely difficult task due to the diversity of services involved. Furthermore, there is a diverse array of agents and institutions involved in the financial intermediation activities. In this study financial development is measured using financial depth which is captured as the ratio of currency held outside financial institutions plus demand deposits and interest bearing liabilities of banks and non-bank financial intermediaries to Gross Domestic Product. Several other measures representing the liquid liabilities of the financial system (e.g., ratio of M1 and M2 and M3 to level of nominal GDP or GNP in some cases) have been widely used (Goldsmith,

1969; McKinnon, 1973; Gelb, 1989; World Bank, 1994; King and Levine, 1993). A major weakness of these ratios serving as proxies of financial development is that they are likely to measure the extent to which transactions are monetized rather than the functions of the financial system such as savings mobilization and efficient allocation of investments as presented in the theoretical models.

3.2 Model specification

In this study, the association between financial development and economic growth is measured using the specification model of Ram Rati (1999), which is the modified model of Odedokun (1996). The specification of the model is written as follows:

$$GY = \beta_0 + \beta_1(GL) + \beta_2(GX) + \beta_3(IY) + \beta_4(DEPTH) \quad (10)$$

where,

- GY = annual growth rate of real GDP
- GL = annual population growth
- GX = annual growth of export
- IY = the ratio of domestic investments to GDP
- DEPTH = financial depth which is the proxy for financial development.

The following are the specific ways the variables were computed:

- (a) Economic growth was measured as the annual growth rate of the real GDP.
- (b) Labour force growth was proxied by population growth which was in turn calculated as the annual growth rate of the population size.
- (c) The investment-GDP ratio was computed as gross nominal fixed capital formation plus the increase in nominal stocks both divided by the nominal GDP.
- (d) Real export growth was calculated as the annual growth rate of real exports of goods and non-factor services.
- (e) Financial depth was measured as the ratio of currency held outside financial institutions plus demand deposits and interest bearing liabilities of banks and non-bank financial intermediaries to Gross Domestic Product.

The effect of financial development on economic growth is expected to be positive and significant. This shows that financial intermediation is an important promoter of economic growth. The other three growth-determining factors considered in this study are real exports, share of capital formation in the GDP and labour force growth are all expected to have a positive effect on economic growth. We then compare the respective positive effects of these factors that have often been emphasized in economic literature as important growth-promoters with that of financial depth (Odedokun, 1996).

Before the estimation of the above function, both dependent and independent variables are subjected to the stationarity test.

3.3 Data sources and type

The study uses time-series data covering the period 1967 to 2006. This period is important because it starts when the Central Bank of Kenya published its first annual financial sector data. Secondly the period includes the pre and post liberalization of exchange rates, interest rates and financial deregulation, all of which are expected to have influenced the performance of the financial sector in Kenya. The sources of data were primarily the Central Bank of Kenya statistics, various Economic Surveys and the IMF international financial statistics publications.

CHAPTER FOUR

EMPIRICAL RESULTS AND ANALYSIS

4.0 Introduction

In this chapter we present the analysis of the empirical results of the study. The focus here is on the causal relationship between the two variables: economic growth and financial development. The time series properties of the variables namely test results concerning unit roots, cointegration and Granger-causality are presented.

4.1 Stationarity test

The first step is to study the unit root properties of the variables. We tested the stationarity of variables using the Augmented Dickey Fuller (ADF) test. A necessary but not sufficient condition for cointegration is that each of the variables should be integrated of same order, and the order must be greater than or equal to one. The test results presented in Table 4.1 and 4.2 show that all variables are integrated at order 1, I(1). That is they become stationary after first differencing. The null hypothesis that each of the time series is non-stationary can not be rejected.

Table 4.1: Unit root test results for levels

| Variable | ADF statistic | Critical values* | | |
|----------|---------------|------------------|---------|---------|
| | | 1% | 5% | 10% |
| GY | -2.607 | -3.6228 | -2.9446 | -2.6105 |
| GL | -2.353 | -3.6228 | -2.9446 | -2.6105 |
| IY | -2.809 | -3.6228 | -2.9446 | -2.6105 |
| GX | -2.687 | -3.6228 | -2.9446 | -2.6105 |
| DEPTH | -1.788 | -3.6228 | -2.9446 | -2.6105 |

* Critical values follow McKinnon (1991)

Table 4.2: Unit root test results for first differences

| Variable | ADF statistic | Critical values* | | |
|----------|---------------|------------------|---------|---------|
| | | 1% | 5% | 10% |
| DGY | -6.441 | -3.6289 | -2.9472 | -2.6118 |
| DGL | -6.041 | -3.6289 | -2.9472 | -2.6118 |
| DIY | -4.518 | -3.6289 | -2.9472 | -2.6118 |
| DGX | -3.876 | -3.6289 | -2.9472 | -2.6118 |
| DDEPTH | -3.720 | -3.6289 | -2.9472 | -2.6118 |

* Critical values follow McKinnon (1991)

DGY: first difference of GY

DGL: first difference of GL

DIY: first difference of IY

DGX: first difference of GX

DDEPTH: first difference of DEPTH

4.2 Cointegration test

The next step is to perform the cointegration test. In conducting this test we employ the Augmented Dickey Fuller test. Cointegration allows us to capture the equilibrium relationship between non-stationary series within a stationary model. It's a method of avoiding spurious and inconsistent regression problems which occur with regression of non-stationary series. Since cointegration is sensitive to the lag length, we use the Akaike Information Criterion (AIC) to determine the appropriate number of lags. Table 4.3 presents results of testing for cointegration using the Engle-Granger procedure. The test for cointegration is based on the linear combination of the residuals of the co-integration series. The residuals of the cointegration regression are in the form:

$$\Delta v_t = \rho v_{t-1} + \sum d_s \Delta v_{t-s} \quad (11)$$

The residuals were checked for the existence of serial correlation.

Table 4.3: The Engle-Granger Cointegration test

| | | | |
|--------------------|-----------|--------------------|---------|
| ADF Test Statistic | -4.342504 | 1% Critical Value* | -3.6228 |
| | | 5% Critical Value | -2.9446 |
| | | 10% Critical Value | -2.6105 |

*MacKinnon critical values for rejection of hypothesis of a unit root.

After performing ADF test on the residual, we do not use the critical values reported here but instead calculate the critical values as follows:

$$C(p) = \phi_{\infty} + \Phi_1 T^{-1} + \Phi_2 T^{-2}$$

In this case,

$$C(1\%) = -2.6095$$

$$C(5\%) = -1.9495$$

$$C(10\%) = -1.6109$$

We thus reject residual unit root test at 1% level implying that the equation is cointegrating.

The evidence of cointegration suggests that the variables are bound together by a long-run equilibrium relationship. This is consistent with economic theory as it indicates that economic growth and financial development have a long-run equilibrium relationship. The positive relationship supports the theoretical prediction of the finance and growth literature.

4.3 Long run equation

The estimated long run equation from the growth model has all the coefficients of the independent variables as positive which is in line with economic theory. This is shown in Table 4.4.

Table 4.4: Long-run relationship

Dependent Variable: GY
 Method: Least Squares
 Date: 06/28/08 Time: 10:38
 Sample(adjusted): 1968 2006
 Included observations: 39 after adjusting endpoints

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| GL | 1.127512 | 0.808788 | 1.394075 | 0.1723 |
| GX | 0.109239 | 0.157810 | 0.692214 | 0.4935 |
| IY | 1.188443 | 0.551901 | 2.153363 | 0.0385 |
| DEPTH | 0.411972 | 1.498239 | 0.274971 | 0.7850 |
| C | 0.014858 | 0.039609 | 0.375114 | 0.7099 |

The long-run relationship can be represented as follows:

$$GY = 0.0148 + 1.1275 (GL) + 0.1092(GX) + 1.1884(IY) + 0.4119(DEPTH)$$

This cointegration suggests that causality between the variables must exist at least in one direction.

4.4 Granger-causality testing

Our objective is to examine the causal relationship between economic growth and financial development. The test results are shown below in Table 4.5.

Table 4.5: Granger –causality test

Pairwise Granger Causality Tests
 Date: 06/26/08 Time: 21:28
 Sample: 1967 2006
 Lags: 3

| Null Hypothesis: | Obs | F-Statistic | Probability |
|---------------------------------|-----|-------------|-------------|
| DEPTH does not Granger Cause GY | 36 | 1.22654 | 0.32290 |
| GY does not Granger Cause DEPTH | | 0.33393 | 0.85267 |

Based on the probability values reported in Table 4.5, the hypothesis that DEPTH does not Granger-cause GY can not be rejected, and the hypothesis that GY does not Granger-cause DEPTH can not be rejected also. Therefore it appears that Granger-causality runs both ways. This means that granger-causality runs from finance to real sector and from

real sector to finance also. Financial development thus leads to economic growth and economic growth leads to financial development. We thus have a bi-directional causality.

4.5 Error correction model

This restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The results of this error correction model are show below in Table 4.6.

Table 4.6: Error correction model

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| DGX | 0.069823 | 0.176187 | 0.396301 | 0.6968 |
| DGL | -0.199765 | 1.355448 | -0.147379 | 0.8846 |
| DDEPTH | 0.765651 | 1.277572 | 0.599302 | 0.5569 |
| DIY | 0.530379 | 0.582362 | 0.910738 | 0.3752 |
| RESID1 | -0.442218 | 0.215328 | -2.053692 | 0.0557 |
| C | 0.045889 | 0.037732 | 1.216199 | 0.2405 |

Table 4.6 shows the short-run relationship. The results indicate that if there is a disturbance or disequilibrium of the function, 44.22% of the deviations will be corrected in the first year, leaving 55.78% to be corrected the following year. The error correction term has the expected negative sign and is statistically significant. It shows the speed of adjustment of the variables to return to equilibrium.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

5.0 Introduction

This section presents the summary of the study and the findings. Areas with probable policy suggestions are identified and explained as indicated in the study objectives. It also shows the areas suggested for further research.

5.1 Summary

This paper set out to examine the empirical relationship between financial development and economic growth for Kenya. The relationship between financial development and economic growth, the short run and long run equilibrium in the relationship between the variables and the existence of Granger-causality between financial development and economic growth were determined. The paper used financial depth which was calculated by following the procedure indicated by Levine (1997) as a proxy to financial development. The dynamic interaction between economic growth and financial development was investigated using the concept of Granger-causality and Error Correction model. Prior to testing for causality, stationarity and diagnostic tests were undertaken. The time series data for all variables was obtained from the International Monetary Fund statistical publications.

The empirical results suggest the existence of a stable long-run relationship between financial development and economic growth. Granger-causality runs bi-directionally between economic growth and financial development.

5.2 Conclusion

The evidence that Granger-causality between economic growth and financial development is bi-directional suggests that high economic growth may encourage more saving and lending in Kenyan economy. This may be due to better business prospects projected by entrepreneurs when high economic growth is achieved. Such evidence

supports the view that high economic growth leads to rapid financial development and is in agreement with the argument by Robinson (1952) that 'where enterprise leads, finance follows'. Strong economic growth results in higher demand for various types of financial services. Hence, more financial institutions, products and services emerge in the markets to meet the increased demand. Therefore, the financial sector may require larger deposit base to finance the increasing demand for borrowings from the private sectors as a result of better economic prospects. Bank deposits are therefore being used to finance loans, and thereby lead to higher output growth. The function of pooling savings by the various financial intermediaries enables investors to access more funds. This then allows large-scaled and profitable investments to be made.

Given bi-directional causality, the fact that finance is important for economic growth is undeniable and a strong association between the two variables has been clearly demonstrated. Patrick (1966) argues that financial development leads to economic growth. The supply-leading phenomenon arises when development in the financial sector leads to growth in the real sector. The situation occurs when the establishment of financial institutions and the supply of their financial assets and liabilities, and related financial services lead to growth in the real sector. This implies that resources are transferred from the traditional (or informal) sector to a more efficient formal sector, given the prevalence of a free market economic environment. The supply-leading financial response is evident in a young economy where sustained modern industrial growth has not yet been achieved.

5.3 Policy implications

From the study, economic growth in Kenya is important in the process of financial sector development. This suggests that financial development flourishes where real economy activity is strong, and that where it is weak or missing, there is plenty of room for government to intervene in credit supply.

The evidence concerning the causality between financial development and economic growth could assist governments to determine what priority should be given to reforms of their financial sector. To achieve the desired benefits of financial development, efforts

should be devoted to deepening the financial sector by restricting government involvement in financial systems, enhancing competition, investing in human resources and the legal environment and to improving the quality of institutions.

More importantly as Stiglitz (1998) has pointed out, prudent regulation is an important part of liberalising financial markets and this had been neglected until its importance was emphasised in the East Asian crash of 1997. The treatment by development economists of the role of finance in development has come a long way in the last 50 years, but recent crises have attested to the continuing importance of governments, institutions and real output in mitigating the effects of financial market volatility. Overstating the power of 'market-led' solutions in the financial sector may (as in other areas of development economics) lead developing countries up a blind alley and leave them further behind in the development process.

5.3 Limitations of study and areas of further research

The study has some limitations since data collection and measurement may not have been accurate. It is likely that measurement errors were obtained in the national accounting data. Different data sources gave different data for the same variable. To maintain consistency, the study relied on data published by the government press and international Monetary Fund (IMF).

For further research, there is need to explore the specific role played by the informal financial sector in poverty alleviation and economic growth, considering other key variables. This calls for an elaborate model that captures both informal financial sector and economic growth. As formal and semi-formal financial activity expands, a further issue for research is the relationship of these sectors to the informal credit sector.

Policy makers need to delve into investigating how to sequence institutional change, so that financial sector deepening does not occur before public sector regulatory and private sector risk management capabilities develop. Policy makers also need to re-focus on the area co-ordination of macroeconomic and financial sector policies in order to encourage the expansion of intermediation without creating inflation or excessive leverage.

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APPENDIX I: DATA

Table A1: Data

| YEAR | NOMINAL GDP | EXPORTS | GROSS FIXED CAPITAL FORMATION |
|------|-------------|----------|-------------------------------|
| 1967 | 8751 | 2506.0 | 1644.0 |
| 1968 | 9595 | 2644.0 | 1790.0 |
| 1969 | 10416 | 2881.0 | 1875.0 |
| 1970 | 11499 | 3207.0 | 2254.0 |
| 1971 | 12845 | 3423.0 | 2884.0 |
| 1972 | 13776 | 4002.0 | 3302.0 |
| 1973 | 15790 | 4812.0 | 3645.0 |
| 1974 | 18776 | 7144.0 | 4075.0 |
| 1975 | 21140 | 7138.0 | 4837.0 |
| 1976 | 25562 | 9434.0 | 5808.0 |
| 1977 | 32699 | 13004.0 | 7800.0 |
| 1978 | 35601 | 11862.0 | 10280.0 |
| 1979 | 39543 | 12002.0 | 10809.0 |
| 1980 | 44648 | 15066.0 | 12451.0 |
| 1981 | 51641 | 15474.0 | 14508.0 |
| 1982 | 58214 | 17552.0 | 13364.0 |
| 1983 | 66218 | 19927.0 | 14349.0 |
| 1984 | 72550 | 23410.0 | 16143.0 |
| 1985 | 100831 | 25524.0 | 17631.0 |
| 1986 | 117472 | 30334.0 | 23064.0 |
| 1987 | 131169 | 27992.0 | 25735.0 |
| 1988 | 151194 | 33084.0 | 30359.0 |
| 1989 | 171589 | 39554.0 | 33156.0 |
| 1990 | 195536 | 51186.0 | 40560.0 |
| 1991 | 224232 | 60511.6 | 42670.8 |
| 1992 | 264475 | 69287.4 | 43776.8 |
| 1993 | 333616 | 134918.0 | 56505.2 |
| 1994 | 400700 | 148225.0 | 75616.2 |
| 1995 | 465654 | 152596.0 | 99497.2 |
| 1996 | 687998 | 172458.0 | 110142.0 |
| 1997 | 770312 | 174653.0 | 118535.0 |
| 1998 | 850808 | 178367.0 | 133366.0 |
| 1999 | 906928 | 189265.0 | 141403.0 |
| 2000 | 967838 | 214831.0 | 161714.0 |
| 2001 | 1020020 | 225172.0 | 185186.0 |
| 2002 | 1035370 | 244468.0 | 178466.0 |
| 2003 | 1138060 | 270118.0 | 179254.0 |
| 2004 | 1286460 | 336360.0 | 207196.0 |
| 2005 | 1445480 | 395787.0 | 264912.0 |
| 2006 | 1642400 | 412416.0 | 309402.0 |

The data is in millions of Kenya shillings.

Source: International Monetary Fund statistical publications.

APPENDIX II: DATA

Table A2: Data

| YEAR | CHANGES IN INVENTORIES | POPULATION | CURRENCY OUTSIDE BANKS | DEMAND DEPOSITS |
|------|------------------------|------------|------------------------|-----------------|
| 1967 | 133 | 10.12 | 452.00 | 949.00 |
| 1968 | 51 | 10.48 | 492.00 | 1133.00 |
| 1969 | 170 | 10.94 | 569.83 | 1103.54 |
| 1970 | 268 | 11.50 | 697.36 | 1271.58 |
| 1971 | 360 | 11.67 | 740.37 | 1389.32 |
| 1972 | -111 | 12.07 | 894.12 | 1685.02 |
| 1973 | -304 | 12.48 | 982.03 | 2130.06 |
| 1974 | 1715 | 12.91 | 1085.73 | 2255.26 |
| 1975 | -496 | 13.74 | 1234.50 | 2593.88 |
| 1976 | 79 | 13.85 | 1625.10 | 3263.14 |
| 1977 | 1024 | 14.34 | 2182.40 | 4767.87 |
| 1978 | 1932 | 14.86 | 2305.01 | 5444.44 |
| 1979 | -484 | 15.33 | 2673.35 | 6327.29 |
| 1980 | 3333 | 16.63 | 3031.51 | 5813.91 |
| 1981 | 2663 | 16.91 | 3568.70 | 6369.96 |
| 1982 | 1990 | 17.57 | 3724.08 | 6797.70 |
| 1983 | 2237 | 18.26 | 4083.04 | 7640.35 |
| 1984 | 2372 | 19.87 | 4370.25 | 8900.82 |
| 1985 | 8119 | 20.38 | 5037.60 | 9218.90 |
| 1986 | 2504 | 21.22 | 6371.10 | 11314.00 |
| 1987 | 6116 | 22.10 | 7687.60 | 11280.80 |
| 1988 | 7417 | 22.45 | 8536.20 | 11551.00 |
| 1989 | 9209 | 22.67 | 9654.60 | 14931.40 |
| 1990 | 6906 | 24.37 | 10829.40 | 16773.00 |
| 1991 | 4351 | 25.02 | 12760.50 | 19155.30 |
| 1992 | 897.8 | 25.84 | 17205.40 | 26620.90 |
| 1993 | 2244.6 | 25.38 | 21354.90 | 33664.40 |
| 1994 | 1683.4 | 26.02 | 24816.80 | 34908.80 |
| 1995 | 2020.2 | 26.69 | 28886.90 | 36185.60 |
| 1996 | -6916.21 | 27.36 | 30390.00 | 40336.60 |
| 1997 | -1901.88 | 28.61 | 36177.80 | 44708.30 |
| 1998 | 8657.13 | 29.30 | 38713.10 | 46670.00 |
| 1999 | -635 | 28.69 | 42963.20 | 56410.90 |
| 2000 | 6826 | 30.34 | 43466.20 | 64910.50 |
| 2001 | 6517 | 29.90 | 45348.80 | 75558.60 |
| 2002 | -21729 | 32.91 | 53895.30 | 86069.80 |
| 2003 | 7288 | 33.78 | 55550.30 | 128297.00 |
| 2004 | 10546 | 34.67 | 62728.10 | 136729.00 |
| 2005 | -25282 | 35.01 | 66327.40 | 157460.00 |
| 2006 | 8428 | 36.55 | 76479.10 | 206583.00 |

The data is in millions of Kenya shillings.

Source: International Monetary Fund statistical publications.

APPENDIX III: DIAGNOSTIC STATISTICS

Diagnostic tests are conducted on the error-correction model in order to determine whether any of the assumptions of the classical normal linear regression model are violated.

(a) Serial correlation

Breusch-Godfrey Serial Correlation LM Test:

| | | |
|---------------|----------|-------------|
| F-statistic | 1.061733 | 0.443730 |
| | | Probability |
| Obs*R-squared | 14.99381 | 0.241775 |
| | | Probability |

There is no serial correlation at lag 2.

(b) Arch LM test

ARCH Test:

| | | |
|---------------|----------|-------------|
| F-statistic | 4.270963 | 0.023325 |
| | | Probability |
| Obs*R-squared | 7.313686 | 0.025814 |
| | | Probability |

There is no autoregressive conditional heteroscedasticity (ARCH) of order 2.

(c) Heteroscedasticity

White Heteroskedasticity Test:

| | | |
|---------------|----------|-------------|
| F-statistic | 1.176599 | 0.352852 |
| | | Probability |
| Obs*R-squared | 11.51400 | 0.318898 |
| | | Probability |

There is no heteroscedasticity problem.

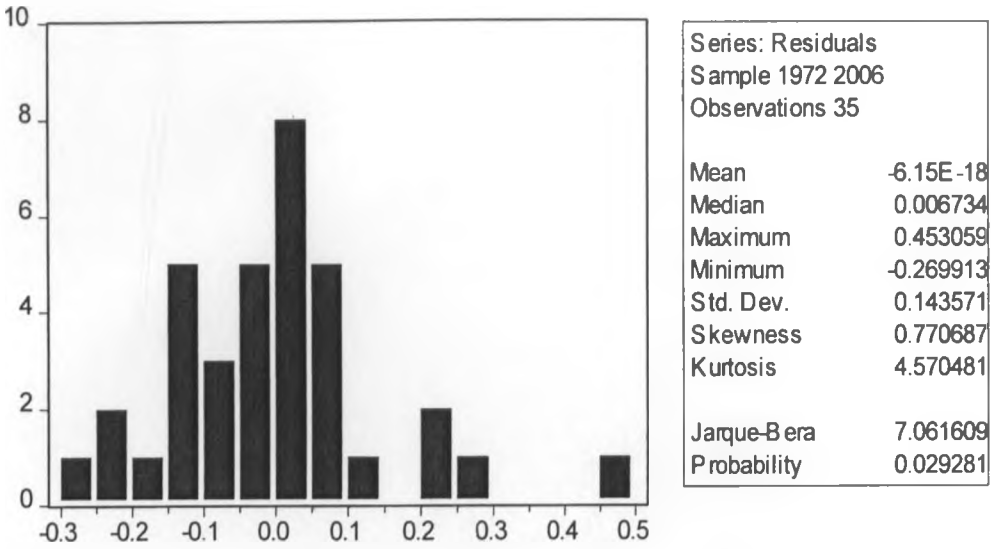
(d) RESET test (two terms)

Ramsey RESET Test:

| | | |
|----------------------|----------|-------------|
| F-statistic | 5.840290 | 0.007803 |
| | | Probability |
| Log likelihood ratio | 12.58253 | 0.001852 |
| | | Probability |

This is Regression Specification Test proposed by Ramsey (1969). The results above show that the model is properly specified.

(e) Histogram Normality test



From the above diagram, it was concluded that the error term is normally distributed given that the Jarque-Bera statistics is not significant at 5% level of significance and the histogram shows a normal distribution. Therefore the regression obeys the OLS assumptions.