THE IMPACT OF FINANCIAL LIBERALIZATION ON SAVINGS IN KENYA
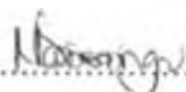
By

Naomi Ndirangu

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Declaration

This is my original work and has never been presented for any degree award in any other university.

Signed .....Ndirangu.................... Date .....04/09/2008.....

Naomi Ndirangu

Approval

This research paper has been submitted with our approval as university supervisors.

Signed .... Date ....4/9/08.....

Dr. Rose Ngugi

Signed .....P.C. Samanta..... Date .....05/09/08.....

Dr. P. C. Samanta

Acknowledgements

Dedication

This paper is dedicated to my parents, Parents, Mr and Mrs Ndirangu for their unrewardable, priceless gift of encouragement and tireless effort in ensuring I accessed higher education, and to my brothers for their support

Abstract

Since the onset of the financial liberalization hypothesis, Kenya has implemented far reaching reforms. However, the experience of Kenya with financial liberalization has been predominantly traumatic, and whether financial liberalization impacts positively on savings, remains purely an empirical issue. This paper presents an analysis of effects of financial liberalization on savings in Kenya during the period 1971 to 2004. To see this effect, this study specified and estimated a long-run real savings model with measures of financial intermediation as its variates.

The overall assessment of the financial liberalization is positive. The economic results reveal that there is a long-run relationship between real savings and measures of financial intermediation, proxied by domestic credit to GDP ratio and financial deepening measured by (M2/GDP). Real deposits rate has positive impact on private saving rates. After analyzing the various channels through which such an impact can take place, we conclude that the overall net effect is ambiguous. On one hand the result suggests a positive and significant association between private saving and financial intermediation. The estimated coefficient is significant, suggesting that higher credit availability does not reduce private saving. On the other hand the results suggest a negative association between private savings and financial deepening. The estimated coefficient is significance and negative, indicating disavings by private sector as financial assets increases.

In general the result illustrates that financial liberalization, combined with adequate prudential regulation and strong supervision of banking can breed a sound and deep financial system able to boost savings over an extended period. It also suggests that larger benefits can be reaped when financial reform does not come as an isolated policy action, but is part of a consistent and comprehensive strategy of stabilization and structural reform in the financial sector.

The ambiguity in these results perhaps suggest that liberalization process was introduced in a hurry when the financial sector was in crisis and without proper macroeconomic stability. The study recommends that maintenance of a stable financial system is

important for the achievement of positive results from the liberalization process. Policy approaches should be geared towards strengthening the legal infrastructure, in order to lower costs and risks associated with non-performing loans, addressing the high intermediation margins. This will make banks attractive to savers hence increasing financial savings.

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CHAPTER ONE: INTRODUCTION

1.1 Background

The impact of financial liberalization on savings and investment is a matter of considerable debate. Mackinnon (1973) and Shaw (1973) set the ball rolling with the thesis that financial repression with ceilings on interest rates, high reserve requirements for banks, and directed credit to specific sectors of economic activity distorts resource mobilization and resource allocation. Removal of these distortions would stimulate savings and investment and hence growth. These propositions have been challenged on the grounds that asymmetric information and moral hazard result in market failure which can only be rectified with government intervention in financial markets (Stiglitz and Weiss 1992). Also, removal of constraints on borrowing by households may stimulate consumption rather than savings; interest rate liberalization may change the composition of savings leaving the total volume of savings unchanged; and the causation may run from growth to savings rather than the other way round.

Today, over 2 decades after their initiation, varying degrees of success with financial liberalization has been noted in some countries, while failures for diverse reasons have been reported in others. In Kenya, financial liberalization started and interest rate liberalized in July 1991. However the country still experiences low savings rates and economic growth. According to the Institute of Economic Affairs (IEA, 2002), the liberalization of the Kenyan financial sector has little impact on the sector and it still faces major problems including: an excess ratio of non performing loans in major banks, ineffective competition on the banking and NFBI sectors, persistent of wide interest rate spread and therefore a high cost of credit, inefficient quantities of credit (and poor quality credit assessments), inefficient depth of access to banking services for the Kenyan public and absence of vibrant institutions for long-term finance for the economy which can be expected to be intermediated through mainstream banks - the expectation that will be greatly enhanced if the immediate problems in some of these banks are addressed.

The Government of Kenya acknowledges the financial sector as key player in the economic recovery process and identifies major players as commercial banks, Non Financial Banking Institutions (NFBIs), the retirement benefits institutions, the capital markets, insurance

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institutions and the development finance institutions. To strength the financial sector, the government pledges to play only regulatory role. In line with this the government is committed to privatize all public banks while also reducing the domestic borrowing. In addressing problems facing the financial sector, the Minister for Finance in his 2003/2004 budget speech introduced reforms to regulate financial sector. These reforms were aimed at making credit and other financial services affordable and encourage savings in order to provide a basis for economic growth and eradication of poverty. Partly, these reforms were also aimed at addressing the persistent public perception that the lending rates in Kenya were unjustifiably so high that the interest rate spreads was unreasonably wide, leading to the discouragement of savers and penalizing borrowers unduly. One wonders whether the full benefits of financial liberalization have been achieved! Measures designed to liberalize the financial sector provided an opportunity to test the Mackinnon-Shaw type of propositions concerning savings, while on the other hand increased savings due to financial liberalization provides an opportunity to evaluate the impact of liberalization on investment and growth.

1.2 The Structure of Kenya's Financial Sector

Kenya financial system is relatively developed and diversified. This is because as is the case with most developing economies major components of a functional financial system, including banks, non-financial banking institutions, microfinance institutions, credit cooperatives, capital market institution, insurance companies, pension schemes and contractual savings are in place in Kenya. Although the sector is described as significantly diversified in terms of the number of institutions, banking services continued to dominate the sector with 43 commercial banks, 2 non-banking financial institutions, 2 mortgage finance companies, 4 building societies and 48 forex bureaus. In terms of business volume the sector is dominated by commercial banks with about 70% of total deposits and lendings in June 2003 were controlled by 7 out of 43 operating commercial banks.

The sector grew steadily after liberalization in 1990s both in the number of institutions and services offered. This is indicated by the growth of the share of financial sector in GDP from 7.9% in 1990 to 9.6% in 1994 and 10% in 1997(Central Bank of Kenya-CBK, 1998). The assets of the banking system more than doubled between 1990 and 1995, while those of the non-bank

financial institutions increased by 16% over the same period. The system like that of any other SSA countries is segmented, to the extent that there are multiple financial markets with different institutions serving heterogeneous needs. The lack of interaction among different units both across and within means the system is fragmented and the coexistence of both formal and informal sector is the case of dualism.

1.3 An overview of financial liberalization in Kenya

At independence in 1963, Kenya experienced a successful economic growth with relative degree of internal and external balance. However, due to the two oil price shock waves in the 1970's, the country later suffered macro-economic imbalances and sluggish economic growth that made it to adopt structural adjustment programme in the 1980s. Though the economy in general attained some degree of stability during this period, the condition later deteriorated, particularly from 1985/86. This prompted the country to reassess the implementation of these SAPs, thereby shifting the emphasis from broad based macro-economic approach to a sectoral implementation approach

During the 1960s and 1970s, the interest rate policy in Kenya remained fairly inactive. The government administered interest rates through a regime of fixing minimum savings rate for all deposit accepting institutions and minimum savings rate for all deposit accepting institutions (Commercial banks, Non-bank financial institutions and building Societies). The first interest rate review was however, undertaken in June 1974 when minimum savings and lending rates were raised by two and one percent respectively (Kariuki, 1995; 5-7). The official policy in Kenya at the time was to follow a low interest policy in order to encourage investment and protect the small borrowers. This however rendered real interest rates negative in the 1970s.

In April 1981, the government switched to setting maximum rather than minimum lending rates. From 1981, a gradual liberalization strategy was pursued and nominal interest rates were reviewed regularly. Specifically, major reviews were in October 1982, June 1984, January 1988, April and November 1989, and April 1990. In 1983, a positive real interest rate was recorded and in July 1991 the interest rates were fully liberalized. The liberalization of interest rates in Kenya has been accompanied by several other financial reforms, including floating of exchange rate and

trade liberalization. During the period of financial liberalization, emphasis was shifted direct monetary control to indirect monetary control. In the latter, policies such as reserve ratio, variable liquidity ratio and liberalized market based interest rates were advocated.

1.3.1 The Performance of the financial sector under liberalization

Financial liberalization in Kenya was fully undertaken in July 1991. This is when CBK liberalized interest for both deposit and lending by banks and financial institutions. This liberalization was expected to lead to improved performance through competition and efficiency in financial intermediation and delivery of services. The period also witnessed series of financial abuses that preceded the multi-party election held December 1992, such as goldenberg scandal This saw an extreme monetary expansion and inflation in this period. The sector underwent rounds of bank failures in mid 1980s and 1990's. Between 1993 and 1996, 6 commercial banks and 12 NBFIs faced insolvency problems. In 1998, five banks were placed under statutory management. The main factors in the financial crisis includes; under capitalization, non performance loans, over investing in speculative property market which saw a decline in prices, inside lending to directors, loans to non viable projects under the influence of officials and difficult in recovering non performing loans. Thus maintenance of a stable financial system is important to achieving of positive results from the liberalization process (Rose, N., 2001).

Table 1 below gives the observed trends and attempts to relate this to developments in the financial market and the economy in general. This table captures nominal and real minimum saving and maximum leading rates. Interest rate spread is defined as the difference between the nominal lending and saving rates measuring the maximum spread. Financial market structure is captured using the financial deepening proxied by the M2/GDP ratio. Although financial theory predicts an increase in interest rates in post liberalization period in Kenya all rates initially rose reflecting the existing financial distress. The minimum saving rate declined from 13.5% in 1990 to 6.9% in 1995, while the maximum lending rate increased to a peak of 38.6% in 1993. Consequently the spread assumed a rising tread which represent the failure to meet prerequisites for successful financial liberalization period. Table 1 below gives the general financial indicators in Kenya between under the full financial liberalization period.

Table 1: Trends in real deposit rates, monetary aggregates, Savings rate and financial liberalization indicators

Period	Saving Rate	Real deposit rate	M2/GDP	Private credit/ Total Credit	Private credit/ GDP
1991	12.9	-2.42	34	62	63
1992	12.8	-7.95	39	48	78
1993	11.3	-4.59	37	46	80
1994	8.6	-8.46	41	45	102
1995	6.9	4.22	41	69	182
1996	8	11.56	45	73	201
1997	9.7	13.67	46	74	232
1998	7.9	4.22	40	73	244
1999	10.9	16.43	58	77	275
2000	9.2	18.40	54	78	289
2001	10.2	11.15	46	74	266
2002	9.5	11.76	45	72	280
2003	10.6	-3.83	40	76	275
2004	11.8	-5.76	39	79	271

Source: Ngugi. R.W. (2001) *and owns computation*

The Figure (1) below trends interest rates, savings and capital formation from 1960 to 2000. After falling from a high rate of 20 percent to negative levels between 1972 and 1977, real interest rates surged upwards from 1978 onwards. Between 1992 and 1996, interest rates were very volatile, reaching an unprecedented peak of 24.6 percent in 1997. This was due to the rising number of non-performing bank loans, increasing levels of uncertainty in the economy and low investor confidence, but was also related to the infighting and tribal clashes prior to and after the multiparty presidential and general elections in 1992. Domestic savings followed the trend, declining from a high level of 10.5 percent of GDP in 1977 to the lowest level of 6.5 percent in the year 2000. According to a UNDP-funded study by Arianna Legovini (2002) on Kenya's macro-economic evolution since independence, gross capital formation declined from a high of 30 percent of GDP in 1978 to 12 percent in 2000. In recent years, the 91-day Treasury Bills rate has declined from 26.4 percent in 1997 to less than 9 percent by December 2002, resulting in a substantial reduction in base lending rates from commercial banks. This has led to stiff competition among commercial banks as they restructure their lending portfolios. At least on this score, investments in the economy should increase. Unfortunately, investments in Treasury Bills

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[1] Real interest rates are calculated as r = (i-infl)/ (1+infl)

in many sub-Saharan African (SSA) countries have been quick, of short gestation period, and highly profitable endeavors.

Real Interest Rate, Domestic Savings and Gross Capital Formation
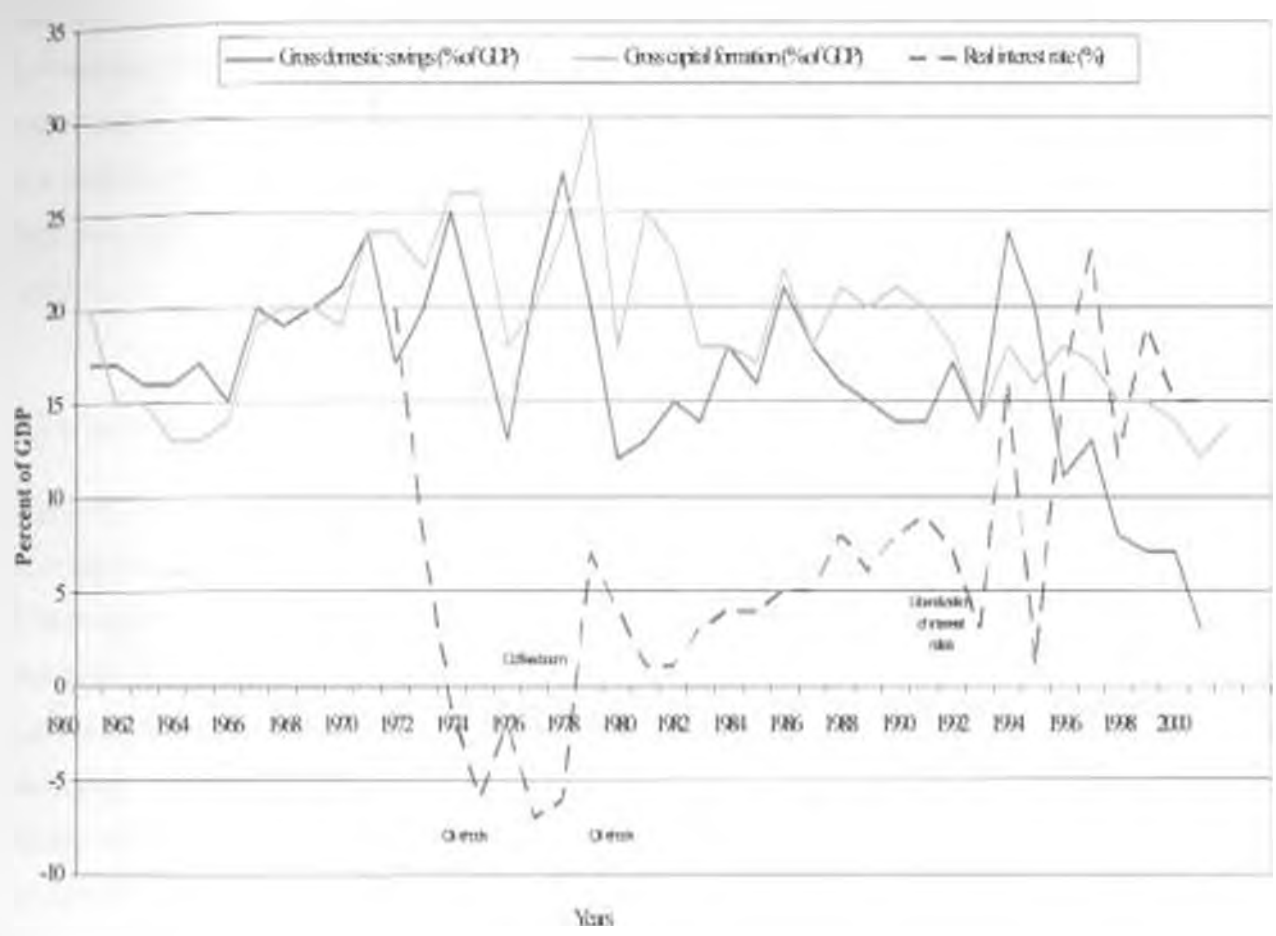
1.4 Savings in Kenya

Savings in a country can be broadly termed as earnings generated in an economy within a given period of time that is not consumed instantly but is put to use in a manner that will offer returns in latter years (Prisnsloo, 2000). Savings behavior influences economic development, high rates of savings are highly correlated with rates of economic growth however, the link between savings and growth is not a direct one, but operates through the effects of investment on growth (Gavin, Hausmann and Talvi, 1997).

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In Kenya the levels of savings have been declining overtime. Between 1984 and 2002 the savings rates (% of GDP) have declined from about 15.9% to 10.4%. This is despite government efforts to encourage domestic savings. For example in various budget speeches, the government has promised various measures to aimed at encouraging mobilization of savings through various investment, for the purposes of generating resources for finances investment. However, Kenya experience shows a consistent decline in the saving and investment. Notably, this concedes with the post-liberalization period. At the same time the investment and saving gap has widened implying that the financial liberalization may not have contributed to easing the financial constraints.

1.5 Statement of the problem

Kenya has witnessed many changes since the beginning of financial sector reforms in the 1980s. Among the list of reforms introduced so far, interest liberalization has been the centre of interest. Unfortunately, the experience of many developing countries (LDC's) with financial liberalization has been disappointing. In the wake of financial liberalization, many counties suffered sharp increases in interest rates, widespread bankruptcies of financial institutions, worsening inflation, widening external deficit and unstable exchange rates (Abayomi and Ikhide, 1997:261). In Kenya for example, gross domestic savings as a percentage of GDP decreased from 18% in 1994 to 11% in 1998.

The 8th national development plan (1997-2001) considered domestic savings during that period to be too low and inadequate for any meaningful industrialization. For industrialization to take place and gain momentum, the development plan advocated a substantial increase in the level of savings Among the impediments to savings, low deposit interest rates and limited diversity of savings instruments have been cited as the main impediments.

Given this scenario and in the view of the doubts arising about the benefits of financial liberalization, which have been expressed even by the World Bank itself (World bank, 1989:27), there is need therefore, to establish whether the financial liberalization policies currently being pursued in Kenya are likely to result in savings mobilization. Moreover, even McKinnon (1989),

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recognizes the pitfalls to financial liberalization and the importance of per-conditions for its success.

Although several attempts have been made to investigate the role of financial liberalization in developing countries, a majority of the studies has concentrated mainly on financial repression paradigm and interest rate determination. Specifically, issues of the relevance of complementarity hypothesis which link financial liberalization, savings, and investment efficient and economic development has not been fully explored. Moreover, the majority of these studies have concentrated mainly on Asia and Latin American countries. Even in these countries where such a study has been undertaken, the results on issues such as complimentary hypothesis were at best inconclusive. In addition, many studies have attempted to capture the impact of financial liberalization on economic development directly. Yet, it is evident that the relationship between financial liberalization an economic development is an indirect one. That is to say that financial liberalization impacts on development through savings, financial deepening, investment efficiency and economic growth.

In Kenya, financial sector reforms have been implemented faster than other reforms particularly public sector reforms. Attempts have been made to captures some of the gist of the Mckinnon hypothesis (Mwega, Ngola and Mwangi, 1990; Oshikoya, 1992; Kariuki, 1995; and Jean-Azam, 1996; Elbadawi and Mwega, 2000). In general, most of the earlier work on this topic was done in earlier 90s, and there has been no recent systematic and rigorous study on how financial sector reforms affect savings in Kenya. This has prompted me take a fresh look on this subject. It is the purpose of this study to provide an analysis of the impact of financial liberalization on savings in Kenya. It is hoped that this study will have a positive contribution towards existing literature.

1.5 Objectives of the study

The main objective of this study is to analyze the impact of financial liberalization on savings in Kenya. It will address the following specific objectives:

1. To estimate the effect of financial liberalization on private savings in Kenya
2. To give policy recommendations based on the results that will be obtained from this study.

1.6 Significance of the study

This study will contribute towards establishing whether financial liberalization exerts any positive influence on savings. The period covered in this study is between 1970 to 2004 covering both the regime of financial repression and financial liberalization. However emphasis is placed on the regime of financial liberalization, where financial liberalization in this context is proxied by flexible interest policy. There is no recent study done on this topic and late studies on this topic were done on early 1990s. This study is crucial since it will capture the recent financial liberalization gains made and therefore contribute the existing literature.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter is divided into parts. The first part deals with the theoretical literature while the second part reviews empirical work undertaken by previous scholars. In both parts, attempts have been made to emphasize on the links between financial liberalization and savings.

2.2 Theoretical Literature

The concept of financial repression has been used to indicate indiscriminate distortions of financial prices including interest rate and foreign exchange rates (Shaw, 1973). Specifically financial repression involves: i) Legal interest rate ceilings; ii) discriminatory credit control; iii) fixed exchange rate; iv) quantitative restriction on the allocation of credit; v) restriction on capital transactions with foreigners; and vi) high reserve ratio. When interest rates are pegged at an artificially low level, keeping the financial costs low stimulates the desired investment. However, low interest rate will at the same time discourage financial savings and thus reduce funds available for lending, so that the desired investment is larger than the realized investment. Milton Friedman (1968) argues "trying to repress interest rate is a particularly serious mistake for a developing country because capital is scarce in these countries". When interest are artificially made low rates and credit directed, people who will have access to capital at these low rates are those people with political influence who might be encouraged to waste the capital in low yielding projects.

The argument which advocates that interest rate liberalization leads to financial development and eventually to economic growth is based on theoretical framework and analytical underpinnings provided by McKinnon (1973) and Shaw (1973). The proposition of McKinnon and Shaw is that a repressed financial sector interferes with economic growth in various ways. First, in a repressed economy the savings vehicles are not well developed and the returns on savings are negative and unstable. Second financial intermediaries that collect savings do not allocate them efficiently among competing uses. Third, firms are discouraged from investing because poor financial policies reduce the returns to investment thus making them uncertain and as a, growth is

retarded Financial repression in this context is defined to entail artificially low deposit and loan rates that give rise to excess demand for loans and to non-price credit rationing (McKinnon and Shaw, 1973).

McKinnon (1973) analyses an open economy with little possibility of external finance for vast majority of investors. He argues that, because of the lumpiness of physical capital, savers may find it convenient to accumulate funds in monetary assets until they have enough resources to invest in high yielding physical assets. In his own words, McKinnon stipulated "deposits may serve as a conduit for capital formation, making deposits and capital complimentary assets". The availability of deposits generating real rates of return may thus encourage both saving and capital accumulation. This however is in contrast with the neo-classical theory where the two assets (money and physical assets) are considered substitutes.

Shaw (1973) also stressed on the importance of positive real deposits rates as an inducement to save in financially repressed economics. However, unlike McKinnon, Shaw emphasizes on external rather than internal financial possibilities as the effective constraint on capital formation. Focusing on the role of deposits as a source of funds for financial intermediaries. Shaw argues that high deposit rates would stimulate investment spending by allowing the supply of credit to expand in line with the financial needs.

Both models of McKinnon and Shaw focus specifically on financial repression in form of deposit and/or loan interest rate ceilings. The real interest rate influences growth through its impact on savings and investment

Dornbusch and Reynoso (1989), consider interest rate reforms to be as a result of the following theoretical propositions: i) positive real deposit raise savings rate, as commodities will be substituted by financial assets; ii) increased real deposit rates assure higher investment level, as more funds are made available within the financial sector for intermediation; iii) increased real rate enhance the allocation of investment and therefore promote higher growth rates of output; iv) increased real interest rate leads to financial deepening; and v) nominal interest rate ceilings are highly destabilizing in the face of inflationary shocks.

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The real interest rate can affect investment through savings and supply of credit to the private sector. If the real interest rates are low, investment are constrained by savings. As a result we can predict a positive relation between real deposit rate and investment. On the other hand, there is adverse relationship between the interest rates and investment through cost of investment. This implies that savings determines the interest rates and there fore cost of investment. Therefore the ideal is that savings determines investment. But what is the casual relationship between the saving and investment especially with the imperfections in the financial markets. Savings behavior influences economic development, high rates of savings are highly correlated with rates of economic growth however, the link between savings and growth is not a direct one, but operates through the effects of investment on growth (Gavin, Hausmann and Talvi, 1997). Keynes pointed that investment is constrained not by the low saving, but by low credit supply.

Theoretical models of growth predict that higher savings rate that would stimulate higher savings and investment results in higher level of capita income and temporarily faster growth (Iris et al, 2001). Neoclassical growth models such as Solow (1956) suggest that an increase in the savings rate generate higher growth only in short run, during transition between steady states. This implies that the growth model is useful in establishing the link between the interest rate, savings, investment and growth. In Harrod- Domar growth model: g ∂s, where g is the growth rate, s is the saving ratio, and ∂ is the incremental capital-output ratio or the amount of investment required to increase the flow of output by one unit. This formula for the actual rate of growth corresponds to the national accounts where savings and investment are always equal. The propensity to save is assumed to be partly defined by the growth of output together with real rate of interest offered on deposit.

2.3 Empirical Literature

Fry (1978) empirically tests McKinnon's complementarity hypothesis using pooled time series data from 10 Asian countries. According to this study, the demand for money function does not support McKinnon's complementarity hypothesis. The coefficient of savings ration in the demand function is found negative and significant. This implies that investment in these Asian LDC s. as a whole cannot be characterized as self-financed. In addition, Fry finds that money is not the only financial recipitory of domestic savings The result of this empirical test is however, found to favor Shaw's debt-intermediation view. He concludes, "one would have to look a long-way down the development latter...to some of the world's least developed countries in a search for complementarity" (Fry, 1978). Fry argues that this conclusion makes sense since the Asian LDC's used in the study have achieved stages of financial development well beyond the phase in which the complementarity assumptions are more reasonably expected to hold. In another study of turkey, Fry (1979) finds a positive and significant relationship between real interest rate and incremental capital-output ratio (ICOR).

Galbis (1979) tests a modified version of McKinnon-Shaw model in 19 Latin American countries using OLS method. The argument behind the modification is that inflation and low interest rates tend to retard investment and rate of economic growth. The study employs three separate equations namely, real money balances, private investment equation and the growth equation. The results of the study showed a positive influence of real deposit rate on real money balances and a negative effect on investment The evidence from the sturdy fails to support the view that inflation is detrimental to growth either because it lowers investment or because it results in misallocation of resources..

Hyuya (1980) uses a simultaneous equation to investigate savings behavior in Uganda. The study finds that interest rate is not an important determinant of both savings and investment Uganda. These findings can be attributed to the controlled interest rates that prevailed in the country during the study period.

Hyuya (1982, 1984) undertakes a study in Uganda that shows that financial intermediation plays a key role in encouraging savings and promoting investment. The study points out the importance of capital accumulation in achieving economic development. While testing on

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causation, and using simultaneous equation model. Hyuya find financial liberalization to be both 'Supply leading' and 'demand following'.

McKinnon (1988), analyses the failure of the standard approach to liberalization in Latin American (including Chile and Argentina). He demonstrates that macroeconomic instability reduces the socially desirable level of interest rates in the banking sector, which makes financial liberalization very difficult.

De Melo and Tybout (1986) investigate the influence of financial liberalization on savings and investment in Uruguay. The study uses Fry (1980) and Giovannini (1985) models to test McKinnon-Shaw hypothesis. The study found that although real interest rate exhibits a positive relationship with the saving with the, the correlation is rather weak.

In the view of theory concerning imperfect information and moral hazard in developing nations, McKinnon (1988) modifies his earlier position of attaining positive real interest rates as a means of solving the problem of financial repression. He instead suggested thwart government should impose a ceiling on standard lending and deposit rates to overcome the banks' moral hazard. Moral hazard in this context refers to the tendency to provide risky loans at high interest rates in expectation that large losses will be covered by deposit insurance, which are provided by the government.

Ajewole (1989) examines the relevance and workability of the McKinnon model for the money demand in Nigeria and its implications using OLS method. The result reported in this study shows that there exist a significant conduit effect between the money asset and other physical assets in the Nigerian economy. Specifically, the study shows that the real demand for money in Nigeria is considerably influenced by real income and return on physical assets. However, the study like many other previous studies does not incorporate stationarity issues. Furthermore, the study only tests the McKinnon demand for money model and as such several issues of the McKinnon's complementarity hypothesis are not considered. Likewise, the study does not incorporate the reversibility aspect of complementarity hypothesis.

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Thornton (1990), using time series data between 1964-1984 tests the relevance of the McKinnon's complementarity hypothesis in India. In his model, the demand for money is made a function of the saving ratio and, simultaneously, saving is made a function of real money balances. The study found a strong support for complementarity hypothesis in both the demand for money and saving function.

Ikhide (1992) conducts a study on financial deepening, credit availability, and the efficiency of investment in African countries. In his analysis he uses 3 variants to test the aspect of financial deepening in these countries. The results show that out of the 17 countries in the sample, real interest rate turned out positive and significant in 12 countries. The variable is significant in Kenya, Ghana, Nigeria, Cameroon, Burundi, Rwanda, sierra- Leone, Ethiopia, Niger, Zambia, Malawi, Ivory Coast and Mauritius. Although the real interest rate is positive in Tanzania, Botswana and Lesotho, it is not statistically significant.

In investigating the demand for money in Tanzania, Isaka (1997 tests the applicability of the McKinnon's demand for money model. The study adopts a model similar to that used by Ajewole (1989). The result of the study confirms the hypothesis that investment is positively related to both demand for money and income. The result also reveals that demand for in Tanzania is negatively related to real rate of interest. In this study, emphasis seems to have been on the determinants of the demand for money in Tanzania, and as such several issues of the complementarity hypothesis are not fully incorporated. Moreover, just like many previous studies, ths study fails to incorporate the reversibility aspect of the McKinnon's complementarity hypothesis. Only the traditional McKinnon demand for money equation is tested. In addition, simultaneous equation bias is no taken into account. The current study intends to investigate all these in details in Kenya.

Fry (1998) estimates a simultaneous equation model in which the real deposit interest rate and the black premium exchange rate affect savings, investment, export growth and output growth. His augments early findings from other studies that direct effects of financial distortions on savings are minuscule. The paper concludes that saving is influenced substantially, albeit indirectly by financial distortions through their effects on investment, export growth and output growth.

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Hisali (1998) traces the impact of financial liberalization on financial savings in Uganda. Using a dynamic specification model, his study reveals that the on-going financial sector reforms have generally contributed positively to the mobilization of financial savings in Uganda.

Khan and Hassan (1998) test the relationship between financial liberalization, economic growth and savings in Pakistan. Using time series data, the study found a strong support for McKinnon's complementarity hypothesis. The coefficient of the savings ratio in the money demand function and real money balances in the savings function are found to be positive and statistically significant.

Bandiera, Caprio, Honohan, and Schiantarelli (2000), construct an index of financial liberalization on the basis of eight different components: interest rates; reserve requirements; directed credit; bank ownership; prudential regulation; securities markets deregulation; and capital account liberalization. Their data spans from 1970-94 for Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey and Zimbabwe. Among the key findings of the estimation of their benchmark model is that, there is no evidence of any positive effect of the real interest rate on saving. Indeed in most cases the relationship is negative, and significantly so in the cases of Ghana and Indonesia. Furthermore, the effects of the financial liberalization index on saving are mixed: negative and significant in Korea and Mexico, positive and significant in Turkey and Ghana. The long run impact of liberalization is, however, sizeable. Corresponding to the realized change in the index, the estimated model indicates a permanent decline in the saving rate of 12% and 6% in Korea and Mexico, and a rise of 13% and 6% in Turkey and Ghana.

Based on an estimate of augmented Euler equations (a la Campbell-Mankiw), Bandiera et al present some evidence of the presence of liquidity constraints. It was not possible, however, to confirm whether financial liberalization removes these constraints. The Euler equation results may suggest, at best, that financial liberalization has had little impact on the amount of credit available to consumers through the formal financial sector. The general conclusion that emerges from this study is that there is no systematic and reliable real interest rate effect on saving; whilst the effects of liberalization have a mixed record.

Bayoumi (1993) examined the effects of financial deregulation on personal saving. Within an overlapping generation's framework, the author argues that deregulation produces an exogenous short-run fall in saving, some of which is recouped over time. Also, deregulation increases the sensitivity of saving to wealth, current income, real interest rates and demographic factors. Using data on the eleven standard regions of the United Kingdom, the author finds that household saving showed an exogenous decline associated with financial innovation — saving also became more sensitive to wealth, real interest rates and current income; though the results imply that much of the decline in savings in the 1980's was caused by the rise in wealth. Financial deregulation also played a significant direct role. In particular, the author concludes that an autonomous fall of 2.25% in the personal saving rate may be attributed to deregulation alone.

Jappelli and Pagano (1994), investigate the role of capital market imperfections on aggregate saving and growth. The analytical framework of their paper is a simple overlapping generation's model, within the context of which it is shown that liquidity constraints on households (but not on firms) can raise the saving rate; strengthen the effect of growth and may increase welfare. Using a panel of OECD countries for the 1960 to 1987 period, the authors conclude that financial deregulation in the 1980's has contributed to the decline in national saving and growth rates in the OECD countries and expressed concern regarding the welfare implications of further liberalization within the European Union.

Koskela, Loikkanen and Viren (1992), describe the institutional aspects of housing markets and analyze the evolution of prices of owner-occupied housing and their interaction with the household saving ratio in Finland in the 1970's and 1980's. The volatility of house prices in relation to income can be traced to a large extent to major changes in financial market conditions. The evidence they present suggests that financial market conditions - as measured by the household's indebtedness rate, the after tax rate of return on housing, and the "thinness" of rental markets - have all had a positive effect on housing prices. Yet, household saving was affected negatively by the rate of change of real house prices, and positively by the after tax nominal interest rate. Taken together, their findings imply those financial conditions, and the liberalization of the mid-1980 in particular, contributed to the decline in the household saving ratio in these countries.

Loayza, Schmidt-Hebbel, and Serven's (2000), produced results, which suggest that the direct effects of financial liberalization are detrimental to private saving rates. The real interest rate has a negative impact on the private saving rate. Its income effect probably outweighs the sum of its substitution and human wealth effects. A 1% increase in the real interest rate reduces the private saving rate by 0.25% in the short run. The indicator of financial depth (M2/GNP) has a small and statistically insignificant impact on the private saving rate. The flow of private domestic credit relative to income has a negative and significant coefficient; relaxing credit constraints reduces the private saving rate. When the flow of private credit rises by 1%, the private saving rate declines by 0.32% on impact. The authors suggest that though they do not find direct positive effects of financial liberalization on the saving rate, if financial reform has a positive impact on growth, it has a potentially important indirect positive effect on the saving rate.

Reinhart and Tokatlidis (2001), in a study of 50 countries (14 developed and 36 developing) report that financial liberalization appears to deliver: higher real interest rates (reflecting the allocation of capital toward more productive, higher return projects.); lower investment, but not lower growth (possibly owing to a shift to more productive uses of financial resources); a higher level of foreign direct investment; and high gross capital flows. Liberalization appears to deliver financial deepening, as measured by the credit and monetary aggregates--but, again, low income countries do not appear to show clear signs of such a benefit. As regards saving, the picture is very mixed. In some regions, saving increased following financial sector reforms; but in the majority of cases saving declined following the reforms. Indeed, it would appear that what financial liberalization delivers is greater access to international capital markets, although this appears to be uneven across regions and income groups.

Mwega, Ngola and Mwangi (1990), in their study test the McKinnon-Shaw hypothesis that an upward adjustment in real deposit rates significantly increases the private sectors' financial and non-financial savings. The result of their study, within Kenya's institutional framework however, fails to support McKinnon-Shaw hypothesis. Instead the result shows that private savings rate and real demand for money are not significantly responsive to a representative deposit rate of interest. Nevertheless, the study does not fully exhaust the gist of the complementarity hypothesis. It also covers a period before Kenya embarked on the full financial liberalization program in 1991.

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Oshikoya (1992) conducts a study on interest rate liberalization, saving and investment and growth in Kenya. From his study, Kenya's experiences with the interest rate deregulation in Kenya at best provide only mild support to financial liberalization theory. Increased real deposit rates intensified competition among banks and non-financial institutions. The study finds evidence of the positive correlation between real interest rate, credit availability and investment. However, this evidence is not robust across sub-periods. Various determinants, other than real deposit rates play a significant role in influencing savings, investment and economic growth.

In applying the McKinnon-Shaw demand model to investigate the impact of interest rate liberalization on financial savings in Kenya, Kariuki (1995) found that the model fails to render support to the postulated positive relationship. The study therefore concludes that financial savings are not significantly responsive to real deposit rate in Kenya.

Unlike other studies, one conducted by Azam (1996) on the impact of interest rate on savings in Kenya yielded results opposite to those of the previous studies. The study finds that there is a significant and positive relationship between the real rate of interest and the national savings rate. He argues that the impact of interest rate on savings cannot be captured unless due account is taken on the role financial repression plays in shaping the relationship between them.

Elhadawi and Mwega (2000) analyze the determinants of private savings in Sub-Sahara Africa. Their analysis shows that a rise in saving rate granger-causes an increase in investment, foreign aid granger-causes a reduction in both saving and investment, and investment also granger-causes an increase in foreign aid. They assert that though savings rate increases investments rate, neither variable is relevant for imitating and sustaining growth in sub-Saharan Africa. However, domestic saving is still likely to be critical in increasing the investment finance and promoting economic growth. They further argue that private savings in the region are constrained by lower per capita income, high young-age dependence ratios, high dependence on aid.

2.4 Overview of literature

The positive link between private savings and financial liberalization still remains a question of empirical investigation. The theoretical literature reviewed showed that financial liberalization will lead to an increase in private savings. However, the results from empirical studies showed mixed results of the effect of financial liberalization on private savings. Some studies reviewed renders support to the existence of positive relationship between financial liberalization and private savings; this is because a well functioning financial sector helps to produce an efficient real interest rate which attracts savings to the banking sector.

CHAPTER THREE: METHODOLOGY

3.1 Theoretical framework

The theoretical thought dealing with financial liberalization has emerged from the work of McKinnon (1973) and Shaw (1973). They argued that an administratively determined nominal rate of interest (a characteristic situation in LDCs according to these authors) holds the real rate of interest below its equilibrium level. This later situation is referred to as financial repression in which fixed low rates of interest give rise to an amount of savings that limits the actual investments. Their core arguments claimed that savings are assumed to be positively related to the real rate of interest at each rate of economic growth. The Mckinnon's theory focuses on the response of real demand for money (broadly defined) and investment to alternative rates of return, but under the assumption that these are the only two alternative forms of assets held by the private sector. The McKinnon model can be summarized as follows;

$$\frac{M}{P} = L(y, r, d - \Pi^e) \qquad l_y > 0, l_r > 0, l_{d-\Pi^e} > 0 \dots\dots\dots\dots\dots\dots\dots 1$$

$$\frac{I}{Y} = F(r, d - \Pi^e) \qquad f_r > 0, f_{d-\Pi^e} > 0 \text{ or } < 0 \dots\dots\dots\dots\dots\dots\dots 2$$

Where:

$\frac{M}{P}$ is demand for monetary balances; y is real income; r is rate of return on capital; d is rate of interest on savings and time deposits; Π is expected rate of inflation and I/Y is the ratio of real investment to real income.

Under the equilibrium condition postulated by McKinnon, the ratio of the actual investment to income ($\frac{I}{Y}$) must be equal to the available savings in the economy. That is

$$\frac{I}{Y} = \frac{S}{Y} = F(r, d - \Pi^e) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 3$$

Where: $\frac{S}{Y}$ is the actual savings to income ratio. Since real deposit rates are below equilibrium under a financially repressed economy, there is a positive relationship between savings and the

real deposit rate $((d - \Pi')$. This is because a rise in interest rates towards equilibrium induces economic agents to shift from other assets to savings.

In order, to get the relationship between savings and the growth in the demand for money we differentiate equations 1 and 3 with respect to the arguments and dividing the differentials. Thus we get:

$$\frac{d\left(\frac{M}{P}\right)}{d\left(\frac{S}{Y}\right)} = \frac{d\left(\frac{M}{P}\right)/d(.)}{d\left(\frac{S}{Y}\right)/d(.)} = \frac{l_0}{f_0} > 0 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 4$$

Equation four states that there is a positive relationship between savings rate and the demand for real money balances. The complementarily hypothesis holds true on the assumption that investment opportunities are plentiful, and that the binding constraint is the supply of savings and not the demand for investable funds (Nyagetera, 1997). Thus we can incorporate the savings rate as one of the determinants of the demand for real money balances:

$$\frac{M}{p} = L(y, S/Y, r, d - \Pi') \quad l_1 > 0, l_2 > 0, l_{d-\Pi} > 0, l_S > 0 \dots\dots\dots\dots\dots\dots\dots 5$$

From equations 4 and 5 in a case where there is disequilibrium in the money market; that is demand for loanable for funds exceeds the supply. Thus in this model a rise in real interest rates leads to an increase in savings and also growth in the demand for money lead to an increase in savings. A problem now is to reverse the complimentary hypothesis, however, since complementarily works both ways in that the conditions of money supply have first-order impact on decisions to save and invest, saving function that must be determined simultaneous with the demand for money is therefore specified as follows:

$$S/Y = f(y, y, M/P, S_t/Y, V) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 6$$

Using equation 5 and since complementarity works both ways in that the conditions of money supply have first-order impact on decisions to save and invest, a savings function that will be estimated in order to estimate the effect of liberalization on savings is specified in equation 6.

3.2 Empirical Model Specification

Since this paper is estimating the impact of the financial liberalization on savings, the saving function in equation 6 is re-specified to include financial development proxies (financial deepening, financial intermediation), real interest rate, and public savings as proportion of GDP and economy openness. We hypothesis that private savings is positively related to real rate of interest rates r, per capita real income y and real public savings Sp. We also recognize that the savings rate tends to be high in relatively open economies, as Greenaway *et al* (1997) point that relatively liberal foreign trade regimes promote savings. To capture economic openness we use the sum of exports and imports divided by the real GDP, XM/Y With financial liberalization we expect financial development. To test whether financial institutions liquidity and borrowing constraints explains saving we use proxy for commercial credit private sector relative to real gross income, S/Y and degree of financial depth is measured by the ratio of M2 to real GDP. Thus our equation will be as below;

$$S/Y = f\left(y, r, M_2/Y, S_p/Y, XM/Y, fi, u\right)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 7$$

Equation (7) can be specified in a log-linear form as;

$$\ln S/Y = \alpha_0 + \alpha_1 \ln y + \alpha_2 \ln r + \alpha_3 \ln M_2/Y + \alpha_4 \ln S_p/Y + \alpha_5 \ln XM/Y + \alpha_6 \ln fi + v\dots\dots 8$$

Where,

S/Y -private savings/real GDP

y — real per capita GDP

M_2/Y — monetary aggregates (M2)/ real GDP

S_p/Y — public savings/real GDP

r = real deposit rates

XM/Y — Sum of export and imports over real GDP

fi = financial intermediation (measured as commercial bank credit to private sector/ real GDP)

v = Stochastic term

3.3 Definition of variables and expected signs

Private Savings

Private savings, by definition, equal the sum of household and enterprise savings, or the difference between domestic and public savings. In this study we are going to use the sum household and enterprise savings which readily available from economic surveys.

Per capita GDP

This variable is used as a measure the economic growth and development. This is a quite appropriate measure since figures on remittances from abroad and depreciation which can enable us to get Net National Product (NNP) are not easily available and when they exists, they are broad estimates which affect the accuracy of results. We therefore use the GDP at factor cost. The GDP figures at the factor cost are better measures of growth than those at market price since they do not contain distortions caused by changes in prices. The yearly GDP is then divided by the total yearly population to get per capita GDP. This is the share of GDP per person per year. We expect a positive relationship between this variable and the dependent.

Financial Development

This study used two measures of financial development: financial Depth and financial intermediation. Financial depth is more related to the ability of the financial system to provide transaction services

a) Financial intermediation

Financial intermediation is a process of pooling the savings from surplus economic agents to deficit economic agents. The extent to which financial intermediation proceed depend on the costs of mobilizing savings from the public in relation to the returns that these institutions expect from the lending of these funds. Financial intermediation continues until it reaches a point where the marginal cost of transforming the saving into financial saving equals the marginal return from their use (Muthama, 2002).

This study uses private credit of the financial system as a ratio of real GDP as proxy for financial intermediation. Private credit is the credit extended to the private sector by commercial banks. It

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isolates credit issued to private sector from credit issued to government, government agencies and public enterprises. It also excludes credit issued by the central bank (Levine et al. 2000). This is a preferred indicator because it improves on other measures of financial intermediation used in other studies. For example Levine and King (1993a, b) used the ratio of gross claims on the private sector to GDP. But, this measure includes credits issued by the monetary authority and government agencies. Levine and Zervos (1998) and Levine (1998) used a measure of deposit money bank credit to the private sector divided by GDP. However, this measure does not include the credits by non-bank financial institutions. Private credit is a broader measure of financial intermediation as it represents a more accurate role of financial intermediaries in channeling funds to private market participants. This, therefore, is the definition of financial intermediation that should be closely related to the level of private savings and hence level of investment. This variable is included to test whether liquidity and borrowing constraints are important in explaining the saving behavior. We expect this variable to be positively related to private savings.

b) Financial deepening

Financial deepening means an increase in the supply of financial assets in the economy. The sum of all the measures of financial assets gives us the approximate size of financial deepening. Whereas the private represents a more accurate role of financial intermediaries in channeling funds to private market participants, and closely related to the level of private savings, the financial depth include private credit as issued by commercial banks, credit issued to private sector from credit issued to government, government agencies and public enterprises and credit issued by the central bank. This study use of the ratio of broad money (M2) to GDP, as done in this study is because of lack of data on other measures of financial assets likely to adequately approximate financial deepening. Financial deepening enables interest rates to reflect relative scarcities, stimulate savings and discriminate more efficiently between alternative investments. We expect a positive relationship between financial deepening and private savings.

Real interest rate

This study used the deposit rate to calculate the real rate of interest. Deposit rate is preferred because it measures the returns on savings in the banking sector. If deposit rate increases we expect an increase in savings in the banking sector.

$$\text{Real rate of interest} = \left[\frac{(R/100) - (Infl/100)}{1 + (Infl/100)} \right]$$

Where R is deposit rate and Infl is inflation.

In developing economy, distortions of financial prices such as interest rates reduce the real rate of savings and the size of financial system in relation to the non-financial system. Policy implication is that this hinders financial development and ultimate reduces growth.

Public Savings

Yet another issue which has aroused considerable discussion relates to the impact of reforms on public savings defined to include current surpluses of public administration and publicly owned enterprises. The seemingly obvious proposition here is that reforms which tend to reduce the profligacy of the public sector would increase public savings and hence total savings. The much discussed Ricardian equivalence theorem, however, argues that an increase in public savings may be offset by an equivalent reduction in private savings leaving the total volume of savings unchanged. The Ricardian equivalence theorem rests on a number of assumptions such as well-functioning capital markets, perfect information, an independent banking sector free of government imposed restrictions, none of which may hold in developing countries. In any case, empirical evidence in support of the theorem is weak. Most studies detect a very weak negative relationship between public and private savings (Edwards 1995, Corbo and Schmidt-Hebbel 1991). Indeed, increased public savings may promote total volume of savings. The experience of the East Asian countries suggests as much [Mahambare V. and Balasubramanyam V. N (2000)]. Central bank is both bank for the state and commercial banks. The difference between total government budget minus current budget with out factoring donor financing is used as proxy of public savings (Levine et al. 2000).

Openness of economy

None of the existing econometric studies on savings discuss the impact of differing types of foreign trade regimes on the savings rate. Most studies on economic liberalization analyze the impact of exports and foreign direct investment on growth, but not on savings (Greenaway *et al* 1997). It is likely that relatively liberal foreign trade regimes promote savings. Typically, the savings rate tends to be high in relatively open economies. Liberal foreign trade regimes may promote savings for a number of reasons. Import competition may serve to reduce the prices of

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consumer durables, so too would increase flows of foreign investment in these industries. The resulting increase in real incomes may promote savings, provided both the income and substitution effects of a growth in income work in favour of savings as opposed to consumption. Liberalization of the foreign trade regime may promote competition and efficiency with a benign impact on growth and hence savings. Also, increased exports may result in increased savings if the propensity to save from export incomes is relatively high. Equally remittances from expatriates abroad may increase with economic reforms and promote savings. This study will use, sum of exports and imports as a proportion of GDP, as a measure of the openness of the economy. It captures how competitive Kenya in trade of its products and services in the liberalized market. The more competitive Kenya is the more the favorable balance of payment. It is expected to influence savings positively.

3.4 Estimation techniques

The presence of unit roots in the macroeconomics variables makes time series testing procedures for causality complex. Therefore we had to use an error correction model that permitted us to estimate the financial savings by a multivariate approach with a proxy of financial liberalization as one of the explanatory variable.

3.4.1 Unit root testing

Economic time series data may exhibit a trend or unit root(s) over time. A time series is stationary if its mean and variance do not vary systematically over time (Gujarati, 2003). A stationary stochastic process implies that the underlying stochastic process that generated the series is invariant with time. The results that come from an econometric analysis when using non-stationary series are ambiguous (Phillips 1986). Granger and Newbold (1974) ascertained that non-stationary time series produce "spurious regression" results where results may suggest statistically significant relationships when in reality there are no meaningful relationships between the variables.

In the presence of unit roots, one may detrend the series or difference the data to remove the non-stationary (deterministic) trend in it. However, this may lead to a loss of some vital long-run

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information contained in the data or it may only partially solve the problem (Harris, 1995). A way around this shortfall is differencing which was proposed by Dickey and Fuller (1981). This is known as the Augmented Dickey-Fuller (ADF) test. It tests for the existence of systematic and linear relationships between past and present values of variables. The ADF is applied to regressions run in the following forms:

$$\Delta Y_t = \beta_1 + \beta_2 T + \delta Y_{t-1} + \sum_{i=1} \Delta Y_t + \varepsilon_t \qquad \text{(ADF regression)}$$

Where T is the time trend variable and ε is the error term which is independently and identically distributed. In each equation the null hypothesis is that $\delta = 0$, that is, there exists a unit root in Y_t. The acceptance of the null hypothesis confirms the presence of unit root. This study adopts the last equation above considering that it takes into account both the stochastic trend and constant rather than just assuming that there exists a stationary trend. Furthermore since the data generating process for the model is unknown the use of this equation ensures that the deterministic components present are taken care of as much as possible. Augmented Dickey-Fuller (ADF) test was complemented by Phillips Perron test.

3.4.2 Cointegration Analysis and Error Collection Modeling

According to Engle and Granger (1987), a linear combination of two or more non-stationary series may yield a stationary series. If such a linear combination exists, then the non-stationary series are said to be cointegrated. This means that the non-stationary series move closely together over time, and the difference between them is stable. The resultant linear combination is called a cointegrating equation, and it may be interpreted as a long-run relationship between the variables. It is likely that there exists a long run relationship between debt servicing and government expenditure on health in Kenya.

Following the work of Engle and Granger (1987) the cointegrating regression is specified as follows:

$$x_t = \alpha_0 + \alpha_1 z_t + \varepsilon_t$$

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The residual of the equation $\varepsilon_t = (x_t - \alpha_0 - \alpha_1 z_t)$ is simply the I(1) series. If the residuals from the linear combination of nonstationary series are themselves stationary, then it is accepted that the I(1) series is cointegrated and the residuals taken from the cointegrating regression as valid which are then built into an Error Correction Model (ECM). An ECM is a restricted autoregression that has cointegration restrictions built into the specification, so that it can be used for cointegrated non-stationary time series. It restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships, at the same time allowing for short-run dynamics. The cointegrating term is known as the error correcting term and it shows the speed with which short-term deviations are corrected gradually towards the long-run equilibrium. This study applied the Augmented Dickey Fuller (ADF) test to the residuals of the statistic cointegration (long-run) regression rather than the levels of the series.

3.4.3 Diagnostic tests

Diagnostic tests are typically used as a means of indicating model inadequacy or failure. For example, in the case of a linear regression model which is estimated by OLS, a series of diagnostic tests could be used to indicate whether any of the assumptions required for OLS to be the best linear unbiased estimator (BLUE) appear to be violated. These assumptions include a serially uncorrelated and homoskedastic error term, absence of correlation between the error term and the regressors and correct specification of the model. Applied econometric work can be viewed as consisting of a number of steps, including specification of the model(s), estimation and model evaluation. Diagnostic testing plays an important role in the model evaluation stage of econometric studies (Otto, 1994). This study carried various diagnostic tests including AR for autocorrelation residuals, the ARCH for heteroskedastic errors, normality test for the distribution of the residuals and the RESET test for the regression specification. In addition the CUSUM test for stability is carried.

3.5 Data type and source

Time series data was used for analysis. The data consists of yearly observations of private and public savings, per capita GDP, public savings, domestic credit, exports, imports, M2, deposit rate and GDP among others. These data are obtained from Central Bank Kenya and are published in the yearly economic survey. The sample runs from 1970 to 2004

CHAPTER FOUR: EMPIRICAL FINDINGS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the analysis of the empirical results of the study. The chapter commences with the descriptive statistics, which gives the normality tests of the series among other statistics. Regression results then follow. Diagnostic tests are presented at the end of the chapter.

4.2 Descriptive Statistics

Before embarking on the details of empirical issues, it is important to examine whether the data exhibits normality. Most economic data is skewed (non-normal), possibly due to the fact hat economic data has a clear floor but no definite ceiling. Also, it could be because of the presence of outliers. The Jarque-bera statistics test is used to test normality of the series. It utilizes the mean based coefficients of skewness and kurtosis to check normality of the variables used. Skewness is the tilt in the distribution and should be within the -2 and +2 range for normally distributed series. Kurtosis put simply is the peakedness of a distribution and should be within -3 and +3 range when data is normally distributed. Normality test uses the null hypothesis of normality against alternative hypothesis of non normality. If the probability value is less than Jarque-Bera chi-square at the 5% level of significance, the null hypothesis is not rejected. Table 4.1 gives the summary of the descriptive statistics of the data used in this study. The normality test shows that per capita real GDP, real deposit rate, financial depth proxy (M2/real GDP) and private sector credit from commercial banks to real GDP ratio as proxy for financial intermediation are normally distributed. The descriptive statistics among others do not give guide on which of the equations is more able to yield better results and highlight on possible problems to encounter. However, there is need to supplement the statistics by more incisive quantitative analysis such as the correlation matrix.

Table 4.1: Summary of descriptive statistics

	Real private savings	Per capita Real GDP	Real deposit rate	Financial depth	Financial intermediation	Real public savings	Economy openness
Mean	13.12	156.35	18.19	35.49	70.57	18.17	33.78
Median	12.40	167.30	14.00	32.00	73.00	17.60	32.28
Maximum	26.00	190.60	72.00	58.00	86.00	26.50	59.16
Minimum	6.90	96.50	5.00	27.00	45.00	10.90	12.70
Std. Dev	4.75	31.48	12.61	7.72	10.08	3.62	12.06
Skewness	0.78	-1.02	2.15	1.19	-1.03	0.28	0.13
Kurtosis	2.82	2.51	10.46	3.78	3.65	2.53	2.24
Jarque-Bera	3.63	6.11	113.58	9.13	6.81	0.77	0.95
Probability	0.16	0.04**	0.00*	0.01*	0.03**	0.68	0.62
Observations	35	35	35	35	35	35	35

Note   ***Reject hypothesis of normality at 5% level*
*Reject hypothesis of normality at 1% level

The correlation matrix is an important indicator that tests the linear relationship between explanatory variables. The matrix also helps to determine the strength of the variables in the model, that is, which variable best explains the relationship between real private savings and its determinants. Table 4.2 presents the correlation matrix of the variables in levels.

Table 4.2 Correlation Matrix

	Real private savings	per capita real GDP	Real deposit rate	Financial depth	Financial intermediation	Real public savings	Economy Openness
Real private savings	1.0000						
Per capita real GDP	-0.6974	1.0000					
Real deposited rate	-0.5885	0.5152	1.0000				
Financial depth	-0.6560	0.4104	0.4378	1.0000			
Financial intermediation	0.4146	-0.4983	-0.6366	0.0198	1.0000		
Real public savings	0.2512	-0.0627	-0.1992	-0.4651	-0.1128	1.0000	
Economy openness	-0.0685	0.4891	-0.0642	-0.2450	-0.1020	0.3368	1.0000

The table above shows that there is a negative correlation between real private savings and per capita real GDP, real deposit rate, financial depth proxy (M2/real GDP) and economy openness proxy- sum of exports and imports to real GDP ratio. Whereas, private sector credit from commercial banks to real GDP ratio as proxy for financial intermediation and real public savings

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are positively correlated with real private savings. The correlation analysis does not indicate a serious problem of multicollinerality.

4.3 Unit root testing

Non-stationarity of time series data has often been regarded as a problem in empirical analysis Working with non-stationary variables lead to spurious regression results, from which further inference is meaningless. It is therefore necessary to explore the time series characteristics of variables. The first step was therefore to test for stationarity. Augmented Dickey-Fuller (ADF) test was used. Phillips Perron test was also used to compliment the ADF test. ADF is an extension of the Dickey-Fuller test which is a test against the null hypothesis that there is a unit root series, integrated of order one and it was employed because serial correlation was present. The graphs of all the variables showed the presence of an intercept and plotting them against time did not indicate the presence of any trend in the variable. We therefore only considered the case where a constant was included in the unit root test, a lag of 2 was included. Table 4.3 shows the results of unit root test of all the variables. All the variables were stationary after first differencing.

Table 4.3: Unit root test

	ADF Statistics (2)	PP test statistics	Order of Integration
Real private savings	-3.304	-10.0975	I
Per capita real GDP	-5.397	-8.664	I
Real deposited rate	-4.339	-9.556	I
Financial depth	-5.495	-12.682	I
Financial intermediation	-2.991	-7.199	I
Real Public savings	-4.639	-4.245	I
Economy openness	-3.396	-5.136	I

Critical values, at 1% level is 3.6661 and at 5% level is -2.9527

4.4 Cointegration analysis

The next step after finding out the order of integration was to establish whether the non-stationary variables at levels are cointegrated. Differencing of variables to achieve stationarity leads to loss of long-run properties. The concept of co integration implies that if there is a long-

run relationship between two or more non-stationary variables, deviations from this long run path are stationary. Cointegration in this study was tested using the Engle-Granger (1987) two-step procedure specified in the cointegrating regression as:

$$x_t = \alpha_0 + \alpha_1 z_t + \varepsilon_t$$

The residual of the equation $\varepsilon_t = (x_t - \alpha_0 - \alpha_1 z_t)$ is simply the I(1) series. The gist in this method is that there is some adjustment process that prevents the errors in the long-run relationship from becoming larger indefinitely (the error correction mechanism- ECM). In this case, we first estimated a static (long-run) model using the least squares method. The result of cointegrating regression are given below in Table in 4.4.

Table 4.4: Cointegrating Regression, reporting the long-run regression results

Real private savings				
Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant	12.148	5.981	2.031	0.054***
Real deposit rate	0.114	0.066	1.721	0.098***
Real Public savings	-4.872	2.595	-1.877	0.073***
Financial depth	-0.092	0.136	-0.682	0.501
Per capita real GDP	0.014	0.026	0.5295	0.601
Economy openness	-0.003	0.007	-0.481	0.634
Financial intermediation	0.191	0.076	2.504	0.019**
R-squared	0.807	Mean dependent var		12.49
Adjusted R-squared	0.740	S.D. dependent var		4.458
S.E. of regression	2.270	Akaike info criterion		4.710
Sum squared resid	118.578	Schwarz criterion		5.122
Log likelihood	-66.363	F-statistic		12.066
Durbin-Watson stat	1.801	Prob(F-statistic)		0.000*

*** ** * *indicate significance levels at 10 percent, 5 percent and 1 percent respectively*

Secondly, we generated the residuals from the above cointegrating regression and evaluated their order of integration using the ADF unit root test. It is vital to note that in this test, the usual ADF critical values are not appropriate hence Engle Granger (1987) calculated the approximate values against which this test can be resolved. These figures can be found from several sources including Charemza and Deadman (1997). Graph of the error term indicated presence of an intercept. The results showed that the residuals were stationary in levels, i.e. I(0), which supports

the existence of cointegrating relationship in the estimation equation. The results are as shown in the Table 4.5.

Table 4.5: Engle-Granger Two Step Cointegration Test Statistic in Levels

Residual	ADF test Statistic	5% critical Value	Inference
ECT	7.0195	5.166	I(0)

The residuals were found to be stationary at 1% and 5% levels of significance. The residuals become the error correction term and consequently, an error correction formulation was adopted.

4.5 Error Correction Modeling and interpretations of results

After accepting cointegration, the next step was to re-specify the equation (9) to include the error correction term (ECM). This term captures the longrun relationship. It reflects attempts to correct deviations from the long run equilibrium and its coefficient can be interpreted as the speed of adjustment or the amount of disequilibrium transmitted each period to real savings. The results of the error correction model are presented in Table 4.6 below. All the variables are in their first difference. Before embarking on the discussion of the regression results, the error correction model was subjected to number of diagnostic tests in order to evaluate its validity. The diagnostic test outcomes were satisfactory. These were: the LM-autocorrelation, which supplement the DW-statistics, the ARCH (Autoregressive conditional heteroscedasticity) which detects the problem of heteroscedasticity, the Jaque-bera test for normality of the residuals and the RESET test for specification of the regression. In addition to the above tests, CUSUM test was done. The results obtained revealed that the parameters were stable and the model could be used for forecasting at the 5% level. Apart from Jaque-Berra normality test, which is distributed as chi-square statistics, the rest of the diagnostic tests utilized the F-statistics distribution. A summary of these tests is included below Table 4.6

Table 4.6: Error correction model reporting the short run relationship

Dependent Variable: Real private savings				
Variable(S) Differenced once	Coefficient	Standard Error	t-Statistic	Probability
Constant	8.103	1.152	7.033	0.004*
Real deposit rate	0.09	0.042	2.286	0.003*
Financial depth	-0.173	0.099	-1.8495	0.076***
Per capita real GDP	-0.056	0.015	-3.6770	0.001*
Economy openness	0.002	0.004	0.6018	0.552
Financial intermediation	0.239	0.064	3.4484	0.002*
ECT(-1)	-1.037	0.232	-5.1715	0.000*
Real public savings	0.156	0.286	0.1893	0.851
R-squared	0.735	Mean dependent var		-0.318
Adjusted R-squared	0.603	S.D. dependent var		3.161
S.E. of regression	2.204	Akaike info criterion		4.646
Sum squared residue	116.681	Schwarz criterion		5.054
Log likelihood	-67.663	F-statistic		5.221
Durbin-Watson stat	1.812	Prob(F-statistic)		0.000*

***, **, * indicate significance levels at 10 percent, 5 percent and 1 percent respectively

Model Test

Normality	$\chi^2 = 1.349$ (0.509)	Autocorrrelation B-G	F= 0.532(0.473)
Heteroskedasticity ARCH	F=1.319(0.260)	Ramsey RESET	F= 18.74(0.113)
White test	F =0.747(0.592]	CUSUM 5% LEVEL	

Table 4.6 above represents the regression results for the existence of a short run relationship among the variables. Notice that F-statistic in both regressions is statistically significant at 1% level, thus implying that all the coefficients of explanatory variables are statistically significance. i.e., real deposit rate, per capita real GDP, financial depth proxied by (M2/real GDP), economy openness proxied by sum of exports and imports to real GDP ratio, private sector credit from commercial banks to real GDP ratio as proxy for financial intermediation and real public savings influences real private savings. The model passes the standard diagnostic tests for reported results which show that: the residuals are normally distributed: there is absence of autocorrelation, and there is no auto-regressive conditional heteroskedasticity. The model is well specified and significant as indicated by the Ramsey Reset test statistic and stability test-CUSUM test.

The regression performed indicates goodness of fit with an adjusted R2 of 60%, Implying that all explanatory variables explains are the deviations of regression from the actual fit, while the residues explains only 40%.

The lagged error correction term (ECT) included in the growth model to capture the long-run dynamics between the cointegrating series is correctly signed (negative) and statistically significant. It indicates a rapid response of output to deviations from long run relationship with each of the variables. In particular, negative deviations from the stationary relationship are "corrected" by increases in output. The ECT coefficient which is- 1.037 implies that about 100 percent of the discrepancy between actual and equilibrium value of savings is corrected each period. Thus, there are economic forces in the economy, which operate to restore the long-run equilibrium path of the real savings following short-run disturbances.

The results shows that the coefficients of financial intermediation measured by commercial bank credit (to total domestic economy sector) to GDP ratio, per capita real GDP, real deposit rate, and financial deepening measured by M2/GDP are statically significant. This implies that these variables have an effect/impact on the real private savings. However, the variables economic openness and real public savings has no impact on real private savings since the coefficient are statistically insignificant.

In particular, there is a negative effect of per capita real GDP on real private savings. 1% rise in per capita GDP leads to 0.056% decline in the rate of real private savings (see Table 4.6). This is expected. An increase in real per capita GDP implies higher total production economy This has a direct link to the level of investment in the economy as the investors add more investment and increase their production to meet the increased demand. As the economy grows and investment increases, people invest from their earlier savings. People are disaving from their earlier savings to invest as the economy grows hence the negative sign between per capita GDP and rate of real savings.

Further, the results real deposit rate coefficient has the correct sign and significant (see 4.6). This indicate that real deposit rate growth affects positively the real private savings at 1% level, which is in line with theory as reflecting efficiency gains and reduced transaction costs with the

removal of distortionary policies and strengthening of the institutional setup. Kenya's experience indicates an increasing deposit rate as well as a widening spread in the post-liberalization period as discussed in the literature. This confirms earlier findings of Mwega *et al* (1990) and Ngugi (2002) that interest rate increased because of yet-to-be gained efficiency and high intermediation costs.

The private sector commercial bank credit to GDP ratio as a proxy for the financial intermediation has the correct sign and is statistically significant at the 1% level. An increase of 1% in commercial bank credit to private sector promotes real savings by 0.293%. These results confirm the existence of financial intermediation as earlier postulated, which contributes to the real savings. This agrees with earlier results of Gregoria and Guidotti (1995), Sirengo (1998) and Kasekende and Atingi- Engo (2003). This can be attributed to the less competition for scarce domestic financial resources by both public and the private sectors. The results however disagree with earlier findings of King and Levine (1993b). Consequently, the current experiments with financial liberalization and restructuring designed to improve the efficiency of financial intermediaries will lead to real savings if credit to productive private sector enterprises increases should continue.

The coefficient of financial depth measured by M2/GDP is statistical significance but has a wrong sign. An increase of 1% in M2/GDP leads to a decline in real savings by 0.173%. These results indicate decreased supply of financial assets in the economy. This result is similar to Bennett et al (2001) findings of negative, significant effect of financial depth, defined as M2 over GDP on the private saving rate. The result suggest that the increase in financial depth observed in last two decades reduced private saving as a ratio of disposable national income. This reflects increased level of investment in the economy as the investors add more investment and increase their production to meet the increased demand. As the economy grows and investment increases, people invest from their earlier savings. People are disaving from their earlier savings to invest as the economy grows hence the negative sign financial depth and real private savings.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Summary

The main objective of this study was to analyze the effect of financial liberalization on real savings. The study was motivated by the weakness that the Kenyas financial sector has continued to experience even after liberalization which perhaps explains the low savings recorded in the last one and half decades. To see this effect the study specified and estimated a long run real savings model with measures of financial intermediation as its variates.

There has been a country-wide trend towards financial liberalization in recent decade, and it is unlikely to be reversed in the foreseeable future. Its impact on private saving rates has attracted a good deal of interest. After analyzing the various channels through which such an impact can take place, we conclude that the overall net effect is ambiguous. On one hand the result suggests a positive and significant association between private saving and financial intermediation. The estimated coefficient is significant, suggesting that higher credit availability does not reduce private saving. On the other hand the results suggest a negative association between private savings and financial deepening The estimated coefficient is significance and negative, indicating disavings by private sector as financial assets increases.

In general the result illustrates that financial liberalization, combined with adequate prudential regulation and strong supervision of banking can breed a sound and deep financial system able to boost savings over an extended period. It also suggests that larger benefits can be reaped when financial reform does not come as an isolated policy action, but as part of a consistent and comprehensive strategy of stabilization and structural reform in the financial sector.

5.2 Policy implications

The strategy to purse economic growth and broader development means diminishing the role of the public sector and greater reliance on the private sector. The share of bank lending which goes to the private sector ought to be increased to avoid public sector programmes crowding out private investment financed through financial saving. This therefore calls for dismantling any impediments to increase availability of credit to the private sector. The government should not

compete with the private sector for domestic credit as well as not try to replace or compete with private sector in providing financial services. Rather the government should embark on reducing the interest rate spread and widen access to credit by the private sector. Policy approaches should be geared toward strengthening the legal infrastructure, in order to lower costs and risks associated with non-performing loans and addressing the high intermediation margins. This will make banks attractive to savers hence increasing financial savings.

There is need for macroeconomic stability, the establishment of conditions that favour private investment and adequate bank supervision, which enhances financial stability. This is crucial for achieving positive results from the liberalization process. Macroeconomic stability necessitates consistent macroeconomic policies.

5.3 Limitations of the study

A major limitation of the study is the problem concerning the data in the Kenyan economy, which lacks relevance and reliability. Different data sources give different data for the same variable. To maintain consistency, the study relied on data published by the government press

This study estimated an augmented real saving equation while incorporating different indicators of financial intermediation as explanatory variables but never specified a separate financial intermediation deepening equation. Specifying both equations could have been better so it would be possible to see the effect both in direction and size of savings and financial development.

5.4 Areas for further research

To judge the development of the financial intermediaries properly, data is needed on the market structure e.g. bank concentration, entry of foreign banks, market capitalization and liquidity, legal and regulatory framework, and accounting practices and payment systems. Also the impact of foreign financial systems on the domestic financial system cannot be ignored. Hence the analysis on financial intermediation and real savings ought to be extended to incorporate the important interlinkages between domestic and international financial markets There is need to do further research on the impact of financial liberalization on the poor. While there has been research on access of the poor to financial services as well as the financial sector liberalization, very little has been done to link the two. What are the transmission mechanisms between financial sector reform and poverty? Also there is need to analyze the effect of financial development (domestic private credit over GDP) on corporate saving.

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Appendices

Appendix 1: Diagnostic tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.532131	Probability	0.473408
Obs*R-squared	0.644954	Probability	0.421923

ARCH Test			
F-statistic	1.319167	Probability	0.26012
Obs*R-squared	1.348790	Probability	0.24549

White Heteroskedasticity Test			
F-statistic	0.747042	Probability	0.681125
Obs*R-squared	0.919009	Probability	0.592472

Ramsey RESET Test			
F-statistic	18.73978	Probability	0.11327
Log likelihood ratio	19.71720	Probability	0.10569

Normality Test

CUSUM TEST for Stability

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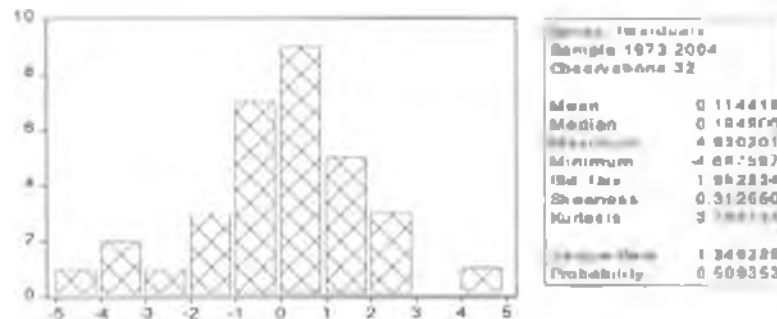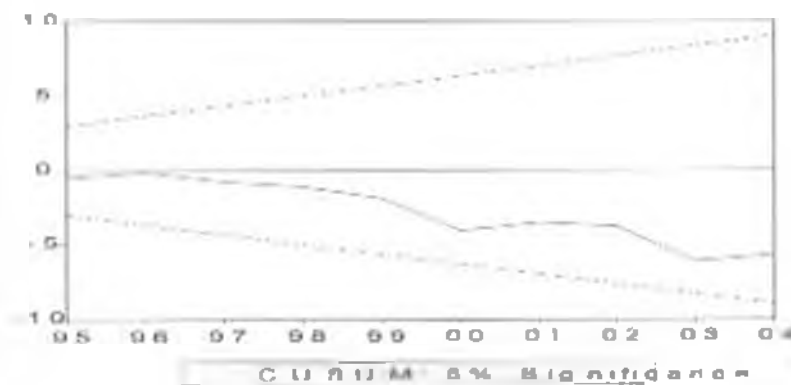
Appendix II: Data used

Year	Private saving	Per capita GDP	Deposit rate	Domestic Credit/Total Credit	M2 GDP	XM GDP	Public Saving GDP
1970	20.50	96.50	5.00	74	30.00	12.70	17.20
1971	18.60	96.50	5.00	83	29.00	11.43	22.10
1972	20.50	97.50	6.00	82	30.00	14.68	17.40
1973	18.40	108.90	7.00	81	32.00	17.39	14.60
1974	19.90	101.50	8.00	86	29.00	26.45	34.40
1975	12.70	99.50	8.00	73	29.00	25.30	12.90
1976	20.60	102.50	10.00	76	29.00	30.68	15.00
1977	26.00	154.50	10.00	82	33.00	40.91	19.60
1978	16.30	113.30	10.00	76	34.00	39.73	22.20
1979	11.70	169.00	10.00	77	36.00	38.60	14.30
1980	14.30	160.80	11.00	79	33.00	52.99	22.60
1981	15.00	165.70	14.00	70	30.00	39.83	23.90
1982	14.80	164.00	16.00	61	30.00	38.17	19.50
1983	18.10	162.40	15.00	69	28.00	49.58	17.90
1984	15.00	157.60	14.00	69	28.00	45.44	17.60
1985	12.60	164.00	14.00	69	27.00	50.57	26.50
1986	12.90	167.30	11.00	83	30.00	36.46	20.10
1987	13.40	183.10	14.00	60	31.00	35.54	20.50
1988	12.20	184.90	15.00	66	29.00	37.44	20.10
1989	12.30	188.70	15.50	69	31.00	38.40	14.80
1990	11.00	190.60	19.00	49	31.00	19.72	20.30
1991	9.90	188.70	29.00	62	34.00	59.16	17.60
1992	9.30	183.10	30.00	41	39.00	18.42	17.90
1993	9.20	167.30	22.00	46	37.00	20.13	14.80
1994	8.60	167.30	30.90	45	41.00	24.29	23.40
1995	8.90	170.20	33.10	69	41.00	29.19	20.20
1996	8.00	186.80	34.60	73	45.00	29.14	16.60
1997	8.00	184.90	30.41	74	46.00	39.65	16.00
1998	8.20	177.70	27.10	73	40.00	31.94	13.00
1999	6.90	175.90	25.20	77	48.00	31.22	14.90
2000	9.30	170.70	19.60	78	54.00	26.56	10.90
2001	10.20	170.70	19.50	74	46.00	21.93	13.40
2002	9.50	169.00	18.30	72	45.00	30.21	17.40
2003	7.70	164.23	13.50	76	40.00	33.31	17.50
2004	8.10	166.44	13.00	79	39.00	32.28	17.90