

**FINANCIAL DEEPENING AND ECONOMIC GROWTH:
TIME SERIES EVIDENCE FOR MALAWI**

MASTER OF ARTS (ECONOMICS) THESIS

**BY
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A thesis submitted to the Department of Economics at Chace, University of Malawi, in Partial Fulfillment of the Requirements for the award of Degree of Master of Arts in Economics.

September, 2007.

DECLARATION

I declare that this thesis is my own work. Where the work of other people has been used, acknowledgements have been duly made. I also declare that it has not been submitted for any degree in any other university. All errors herein are my own.

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CERTIFICATE OF APPROVAL

We certify that this thesis is the student's own work and acknowledgements have been made where the work of other people has been used. We further certify that it has not been submitted to any other university for any degree and is therefore submitted with our approval.

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DEDICATION

To the woman whose modesty and blindness of others prevented her from being recognized for the genius she was. To the mother who died too young but lived long enough to know I would get here. To the nineteen years we spent together. To the kindest person I have ever known. In loving memory of my dearest mother Ester Mukiwa. **RIP**

To my sister, Rachel and

To the man who gave me a home, offered me food, taught me to go to school and kept reminding me to always read *psalms* 23. To my grandfather, Mr. B.E. Mukiwa.

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In the name of the father, the son and the holy spirit, AMEN.

ABSTRACT

The overriding objective of this study is to investigate the causal relationship between financial deepening, taken to mean an increase of financial assets in the economy, and economic growth in Malawi. The empirical investigation is based on the neoclassical growth model augmented with financial deepening and other growth-related factors, using annual time-series data covering the period 1970-2004.

Cointegration analysis and Error Correction Mechanism (ECM) were used to investigate this relationship. Results of the study indicate that there is a robust positive long-run relationship between financial deepening and economic growth. Furthermore, human capital, trade openness and investment were also found to share a positive relationship with economic growth. Inflation was found to exert a negative influence on economic growth. Financial liberalization was also found to impact positively on economic growth.

The empirical results of this study yield some policy implications. The results suggest the need for concerted efforts to improve the growth of financial saving as well as the need to improve the level of financial intermediation so that a larger set of clients can access credit from financial intermediaries. The important role of investment in determining economic growth underscores the need for policies that will attract both foreign and domestic investment. Furthermore, the results indicate that there is need for policies that improve the education sector as well as those that curb inflation and maintain it at minimum levels.

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CHAPTER ONE

INTRODUCTION

1.0 Background

Whether financial deepening promotes economic growth has been a subject of great interest and debate among economists for many years. Traditionally, the debate has revolved around whether deepening in the financial system results in a faster economic growth. A large body of literature has emerged, both at the theoretical and empirical level, attempting to address this question. However, no clear consensus has been reached on this issue.

Two opposing views have emerged from the theoretical literature. There are those who argue that financial deepening is an essential element for economic growth.¹ They 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. Furthermore, well developed financial systems allow economies to reach their potential since they allow firms which have successfully identified profitable opportunities to exploit these opportunities as intermediaries by channelling investment funds from those in the economy who are willing to defer their consumption plans into the future. On the other hand, there are those who regard financial deepening as a relatively unimportant factor². According to this perspective, economic development creates demands for particular types of financial services and the financial system simply responds to these demands. This study attempts to contribute to the debate using time series data for Malawi.

The rival schools of thought on the relationship between financial and real development have failed to resolve a central issue of the controversy, namely whether the development of financial institutions precedes, and therefore plays an active role in economic development, or whether it passively adjusts itself to the growth of the real sector. Patrick's (1966) analysis of the role of finance in

¹ See Levine (1993), Demetriades and Hussein (1996)

² See Lucas (1988)

developing economies introduced a new dimension to the debate by delineating two types of financial development. The first, called 'demand following', views the demand for financial services as dependent upon the growth of real output and upon the commercialization and modernization of agriculture and other subsistence sectors. Thus the creation of modern financial institutions, their financial assets and liabilities and related financial services are a response to the demand for these services by investors and savers in the real economy (Patrick, 1966:174). On this view the more rapid the growth of real national income, the greater will be the demand by enterprises for external funds (the saving of others) and therefore financial intermediation, since in most situations firms will be less able to finance expansion from internally generated depreciation allowance and retained profits. For the same reason, with a given aggregate growth rate, the greater the variance in the growth rates among different sectors or industries, the greater will be the need for financial intermediation to transfer saving to fast-growing industries from slow-growing industries and from individuals. The financial system can thus support and sustain the leading sectors in the process of growth. In this case an expansion of the financial system is induced as a consequence of real economic growth.

The second causal relationship between financial development and economic growth is termed 'supply leading' and is defined as the creation of financial institutions and the supply of their financial assets, liabilities, and related financial services in advance of demand for them, especially the demand of entrepreneurs in the modern growth-inducing sector. It has two functions: to transfer resources from the traditional, low-growth sectors to the modern high-growth sectors and to promote and stimulate an entrepreneurial response in these modern sectors (Patrick, 1966:75). This implies that the creation of financial institutions and their services occurs in advance of demand for them. Thus the availability of financial services stimulates the demand for these services by the entrepreneurs in the modern, growth-inducing sectors.

The modern literature on economic growth starts with Robert Solow's work in the mid 1950s³. The early theoretical and empirical literature focused on the role of capital and labour resources and the use of technology as the sources of growth. For the most part, any possible role of the financial sector in the growth process was ignored. To the contrary, development economists up until the 1970s would often advocate explicit manipulation of the financial sector in order to achieve development goals. Credit subsidies to favoured activities were the rule rather than the exception. The financial sector – both domestic markets and international capital flows – was often the most heavily controlled and regulated component of the economy. However, a major shift towards a market-oriented approach began about three decades ago.⁴ Although capital controls prevailed around the world in both developed and less developed economies, there has been significant liberalization in recent years.⁵ A consequence of financial liberalization, it has been argued, is the deepening of the financial sector.

1.1 Problem Statement

Since it got its independence in 1964, Malawi has experienced fluctuating trends in economic growth. After a remarkable performance from 1964 to 1979, the economy faced some set backs starting from 1979. This poor performance has been attributed to several factors among them the external shocks such as the two major oil shocks, the Mozambican civil war in 1980, and the drought in 1981. During the previous decade, although the economy relatively picked up, it was still facing some problems like deteriorating terms of trade, exchange rate depreciation, decreasing investment rates and rampant corruption. With such an unpredictable trend of economic growth, an investigation of the determinants of growth is indispensable. Yet, of the few studies that have investigated the

³ Robert W. Solow formulated the basic neoclassical growth model.

⁴ This followed the works of McKinnon (1973) and Shaw (1973) who claimed that liberalisation from such restrictions as interest rate ceilings, high reserve requirements, and selective credit programmes, facilitates economic development.

⁵ The IMF reports large numbers of countries taking measures to liberalise capital flows while the number of tightening measures has declined (IMF, 1999, ch. III)

determinants of economic growth in Malawi, financial deepening has not been included despite its prominence on the international research forum.

Since the 1990s, a burgeoning empirical literature has illustrated the importance of financial sector deepening for economic growth. This growing consensus, however, has largely emanated from cross – country analysis. Recognition of the methodological weaknesses of the cross-country regression analysis⁶ has prompted this study to investigate the causal links between financial deepening and economic growth using time series data of an individual country. In this way, it will be possible to avoid pooling data from different countries, where the economic mechanisms at stake may be different. By focusing on a single country, it will be possible to keep substantial variability within the sample.

Beginning in the mid-1980s, Malawi started reforming the financial system. Among others, the financial liberalization program was aimed at promoting competition in the financial sector and developing the scope for financial intermediation with a view to mobilizing savings. Since the financial liberalisation programme was launched, there have been several studies that have examined the financial system in Malawi. Most of these studies have looked into a number of related themes when studying the impact of financial liberalization on growth, including the links between financial liberalization on the one hand, and saving and investment on the other. For example, Kamanga (1999) examined the impact of financial liberalization on private investment in Malawi. Shawa (2000) examined the impact of financial liberalization on income velocity while Chirwa and Mlachila, (2004) investigated the impact of financial sector reforms on interest rate spreads in the commercial banking system in Malawi. Most of these studies have focused on other aspects of financial liberalization the author is not aware of a study that explicitly examined the impact of financial deepening on economic growth in Malawi. This study intends to examine the impact of financial

⁶ These weaknesses are discussed in chapter 3.

liberalization policies that Malawi has pursued using financial deepening as a transmission channel.

1.2 Research Objectives

The main objective of this study is to offer new perspectives on the long-lasting debate of the finance – growth nexus by analyzing the effect of financial deepening on growth. In more specific terms, the study seeks to achieve the following specific objectives:

- Investigate the effect of the ratio of quasi money to income on economic growth
- Examine the effect of the ratio of private credit to domestic credit on economic growth
- Analyze whether inflation impacts on economic growth
- Assess the impact of human capital on economic growth
- Examine the effect of trade openness on economic growth
- Investigate the impact of investment of economic growth

1.3 Hypotheses

In light of the specific objectives, the study will test the following hypotheses:

- The ratio of Quasi money to income does not impact on economic growth
- The ratio of private credit to domestic credit does not affect economic growth
- Inflation does not impact on economic growth
- Trade openness does not influence economic growth
- Human capital does not affect economic growth
- Investment does not influence economic growth

1.4 Justification of Study

The finance-growth nexus cannot be ignored without substantially limiting our understanding of economic growth. Financial market reform has been high on the agenda and is frequently addressed in policy prescription packages by the IMF and World Bank. Financial deepening as a determinant of growth is an interesting variable because there is much a government can do to foster or restrain it. It is therefore important to know how financial development policies will affect growth.

While precise measures of the impact of financial deepening on growth are important to the academic literature, they are also essential for the policy arena. Sustainable economic growth is central to Malawi's ability to reduce poverty and achieve the Millennium Development Goals (MDGs). Without this growth, it will be difficult to deliver Government's vision of creating wealth and employment for all the people of Malawi, transforming from a consumption-based economy to a production-based economy, and gradually emerging as an industrial nation. In the 2006/07 fiscal year, the government of Malawi adopted the Malawi Growth and Development Strategy (MGDS) as the overarching strategy for Malawi for the next five years. The purpose of the MGDS is to serve as a single reference document for policy makers in Government; the Private Sector; Civil Society Organizations; Donors and Cooperating Partners and the general public on socio-economic growth and development priorities for Malawi. The overriding philosophy of the MGDS is poverty reduction through sustainable economic growth and infrastructure development. The MGDS identifies six key priority areas, which define the direction the country intends to take in the next five years to achieve economic growth and wealth creation that are critical for immediate improvement in the economic well being of Malawians.⁷ However, the financial sector is not included as a priority area. Therefore, research that clarifies our understanding of the role of finance in economic growth will have policy

⁷ These are; agriculture and food security, irrigation and water development, transport infrastructure development, energy generation and supply, integrated rural development, prevention and management of nutrition disorders, HIV and AIDS.

implications and shape future policy-oriented research. Information about the impact of finance on economic growth will influence the priority that policy makers and advisors attach to reforming the financial sector. Furthermore, convincing evidence that financial deepening influences long-run economic growth will underscore the urgent need for research on the political, legal, regulatory as well as policy determinants of financial deepening.

1.5 Organisation of Study

The rest of the study is organised as follows: chapter two looks at the financial deepening process in Malawi. The performance of Malawi's economic growth is also reviewed in this chapter. Theoretical literature and empirical evidence is critically reviewed in chapter three. In chapter four is discussed the methodology employed in the study. Estimation and interpretation of results are presented in chapter five. Finally, chapter six concludes and discusses the policy implications of the study.

CHAPTER TWO

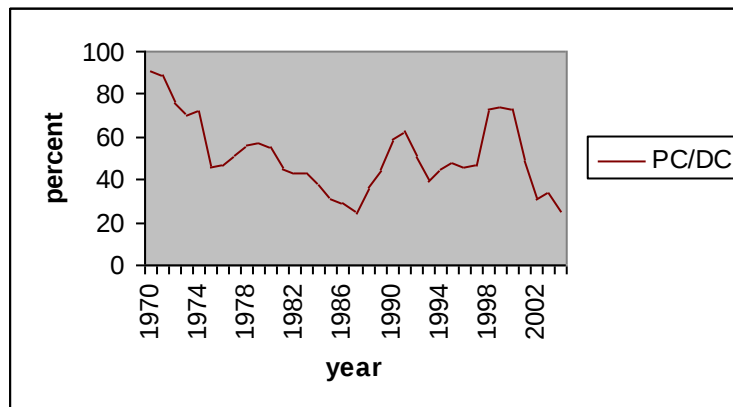
FINANCIAL DEEPENING AND FINANCIAL SECTOR REFORMS IN MALAWI

2.1 Indicators of Financial Deepening

This section will discuss the variables that have been used to explain financial deepening in Malawi.

The first variable representing financial deepening is the share of the private sector credit in the domestic credit. This indicator may capture the aspect of domestic asset distribution of an economy. Within the period of study, the variable behaved as shown in figure 2.1 below. The figure shows that from 1970, the share of private credit in total domestic credit started falling. This is not surprising considering the fact that during this period the financial sector was repressed and there was proactive government intervention and credit subsidies to favoured activities such as agriculture were the rule rather than the exception.

Figure 2.1 share of private credit in domestic credit



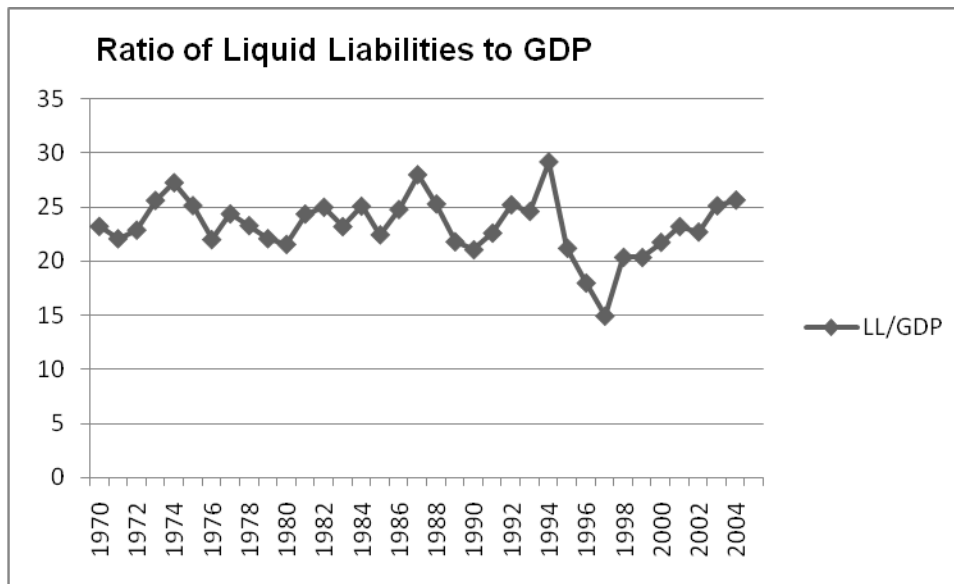
Source: IMF financial Statistics

Beginning 1988, the ratio took an upward trend and this was against the background of financial liberalization. During this period was when the government took serious steps to liberalize the financial sector. This resulted in increased savings due to a rise in real interest rate. An increase in the savings rate resulted in increased levels of loanable funds hence the upward trend.

However, this trend was short-lived as the ratio started declining again after 1990 but picked up again when the country embraced the multiparty form of government in 1994. A financial system that simply funnels credit to the government or state-owned enterprises may not be evaluating managers, selecting investment projects, pooling risk and providing financial services to the same degree as a financial system that allocates credit to the private sector. Lynch (1996) argues that government credit from banks in countries with a highly regulated financial system is frequently captive and that banks have no control over its use. Consequently, their lending to the private sector best represents the important credit allocation role of banks. The share of the credit given to the private sector in the domestic credit may reflect another aspect of the financial sector and can be used as a proxy for financial development.

An alternative to a broad money ratio is ratio of bank deposit liabilities to income as a quality proxy for financial deepening (Demetriades and Hussein, 1996). In developing countries, a large component of the broad money stock is currency held outside the banking system. In principle a rising ratio of broad money to income may reflect the more extensive use of currency rather than an increase in the volume of bank deposits. Therefore in order to obtain a more representative measure of financial deepening, currency in circulation should be excluded from the broad money stock. One such proxy is the ratio of bank deposit liabilities to income. The figure below shows the ratio of liquid liabilities to income for Malawi for the period 1970-2005. The figure above shows interesting trends. Contrary to the theoretical argument that financial liberalization should lead to an increase in interest rates hence individuals will be encouraged to save, the figure above shows that individuals saved more during the pre-liberalization era (before 1987) than afterwards.

Figure 2.2 Liquid Liabilities as a share of GDP



Source: International Financial Statistics (IFS)

Beginning the year 1994 when the country embraced the multiparty form of government, the figure above shows that the ratio of liquid liabilities started declined and reached a record low in 1994. In the same year of 1994, the domestic currency was floated on the foreign exchange market. Effectively, this meant that market forces determined the rate at which the domestic currency could be traded with foreign currencies. This may have motivated individuals to hold foreign currency in order to hedge against market risks and this could be one of the reasons why the ratio in the figure declined.

2.2 Financial Sector Reforms in Malawi⁸

The pre-independence financial system served primarily the needs of the expatriate communities and as such the set of financial policies between 1966 and 1980s were the first general set of policies that concentrated on both institutional building and review of policies that would make credit available at various designated sector economic agents considered as deprived sectors (Gondwe, 2000). However, during the period before 1987 the financial sector

⁸ A full table of chronological financial reforms developments in Malawi is provided in appendix 8.

was not being supportive enough in accelerating economic development. There was an unsatisfied credit demand, implying that credit constraint had been predominantly the inhibiting factor. The Banking Act of 1965 was very restrictive in entry conditions and this contributed to concentration of banking services in a few banks⁹.

Since the mid-1980s, Malawi has attempted to reforming financial systems to promote competition in the financial sector. Financial liberalization has also aimed to develop the scope for financial intermediation with a view to mobilizing savings. High Inflation has been a regular feature in Malawi, often resulting in negative real interest rates. Consequently savings growth has been suppressed, while government developed a growing appetite for borrowing. Much of the slow growth of employment, hence incomes is associated with the declining ratio of credit to private Sector in relation to GDP. Government borrowing has also resulted in the "excess liquidity syndrome" a very recurrent feature arising from regular participation of the Reserve bank in financing government borrowing. Excess liquidity is also commensurate with high inflationary expectations and heightened exchange rate risk that gave way to pernicious speculation.

Financial sector reforms in Malawi were initiated in 1987 with the liberalization of lending rates. Although such measures were done in the context of IMF - supported programs, there was relatively little systematic analysis nor a serious financial reform agenda until 1989 (Chirwa and Mlalchila, 2004). The World Bank, in its 1989 analysis of industrial sector in Malawi, cited financial sector underdevelopment as a key impediment to economic growth in Malawi. Financial sector reforms effectively started in 1989 when the legal framework for the financial sector was reviewed leading to new and revised legislation. The Reserve Bank of Malawi (RBM) act of 1989 and the Banking Act of 1989 were significantly revised in order to give more powers to the central bank to supervise

⁹ According to Chirwa (1999), the restrictive conditions included seeking ministerial approval for branch extension, a minimum of MK10.5 million for commercial bank entry into the system, heavily controlled interest rates, and credit rationing among others.

the financial sector, to introduce monetary instruments and to regulate entry of new banks into the financial system. Bank supervision was significantly enhanced in order not only to more effectively assess applications for entry by new institutions, a process that had hitherto been ad hoc and nontransparent (Chirwa and Mlachila, 2004).

In 1990 provision was made for the Investment and Development Bank of Malawi (INDE Bank), previously not a deposit-taking institution, to now accept corporate deposits. In May, the central bank introduced a Bank rate, linked to an official auction rate of treasury bills followed by the granting of permission to parastatals to switch their deposits from the Reserve Bank of Malawi to commercial banks in October 1990. In November the Central Bank introduced the monthly auction of reserve Bank of Malawi bills, open for commercial banks, and the final removal of credit ceilings in January 1991. In June the same year, Standard Bank Financial Services Limited (then Commercial Bank of Malawi Financial Services Limited), a subsidiary of Standard Bank limited (then Commercial Bank of Malawi) was incorporated. Furthermore, two more financial institutions were incorporated as commercial banks; Finance Corporation of Malawi and Indebank Financial Services Limited in August and September respectively.

In February 1994, the Malawi Kwacha was floated in the foreign exchange market. In the same year, First Merchant Bank was incorporated as a commercial bank in July and the LRR was increased to 35%. In March the following year, two commercial banks were incorporated; Finance Bank and Malawi Savings Bank. In the same year, the Malawi Stock Exchange (MSE) was established. The MSE has been in existence since 1994 but started equity trading in November 1996 under the aegis of the Reserve Bank of Malawi (the central bank), with 2300 Malawi citizens buying shares in Malawi's largest insurance firm, the National Insurance Company (NICO). Prior to the listing of the first company, the major activities that were being undertaken were the provision

of a facility for secondary market trading in government of Malawi bonds namely, Treasury Bills and Local Registered Stocks.

With respect to the monetary policy, the central bank introduced indirect instruments in an effort to curb excess liquidity in the form of central bank bills and, later, treasury bills for open market operations. However, lack of confidence coupled with the perceived high cost of monetary policy led the central bank to maintain the use of relatively high liquidity reserve requirements as an important lever of monetary policy (Chirwa and Mlachila, 2004). During the period 1990-92, changes in the reserve requirement were the main policy instrument, with six adjustments, four of which occurred in 1990 alone. The reserve requirement was introduced in 1989 at 10 percent, went up to 35 percent in 1994, and is now at 15.5 percent. The penalty for non-compliance was introduced in 1992 at 18 percent with the reserve requirement at 20 percent, and reached a peak of 60 percent until it dropped to 43 percent in 1997. At first, liquidity reserves deposited with the central bank earned interest, but they ceased to earn interest at the end of 1990. The Liquidity reserve requirement was changed from daily to monthly average and the Reserve Bank of Malawi started paying interest on reserves in 1997 although this was short-lived.¹⁰

In as far as Open Market Operations (OMO) were concerned, Treasury bills (TBs) auctions, as a major indirect monetary policy instrument, were introduced in 1992. However, the purposes for the issuance of such bills were two-fold: first, for fiscal budgetary purposes and, second for liquidity management purposes (Sato, 2001). Originally Treasury bill tenors were of 30 days, 60 days and 91 days. The 30 days and 60 days maturities were abolished and replaced with 183 days and 271 days tenors, respectively. Before 1995, Treasury bill auctions were held once a month. Currently they are held every week to ensure a smooth monetary policy implementation. In 1998 the Bank acquired some treasury bills to be used solely for monetary purposes. The two issues however, did not carry

¹⁰ In the following year, the central bank stopped paying interest on reserves.

different rates of interest because it made no difference in the participating agents as to whether one was monetary or budgetary. A distinction was, nonetheless, made in the accounting sense. The central bank assumed responsibility over the monetary bills while government was responsible for honouring obligations arising from issuance of budgetary bills. Proceeds of monetary policy issues were fully frozen in the Bank until maturity. In a bid to remain more transparent in its monetary operations, the Reserve Bank of Malawi began issuing its own bill (RBM bill) in August 2000 to supplement the existing, and replace, monetary Treasury bills gotten in 1998.

In 1998, the first ever discount house in Malawi, Continental Discount House, was incorporated and interbank market lending among banks was introduced. Commercial banks were granted the discretion to put reserves with either the central bank or discount house or their vaults. In the same year, another merchant bank, Loita Investment Bank was incorporated.

An inter-bank market was instituted in February 1997. Since then the financial sector has experienced a substantial growth in the level of transactions. The volume of transactions passing through the market rose from K966.7million in April 1997 to K35,045.5 million by the end of 2000. The introduction of the market assisted the financial institutions in their liquidity management thereby creating some flexibility in serving their customers while reducing commercial bank recourse to the central bank window. At the same time, the market provided an arena for promoting a market-based monetary policy.

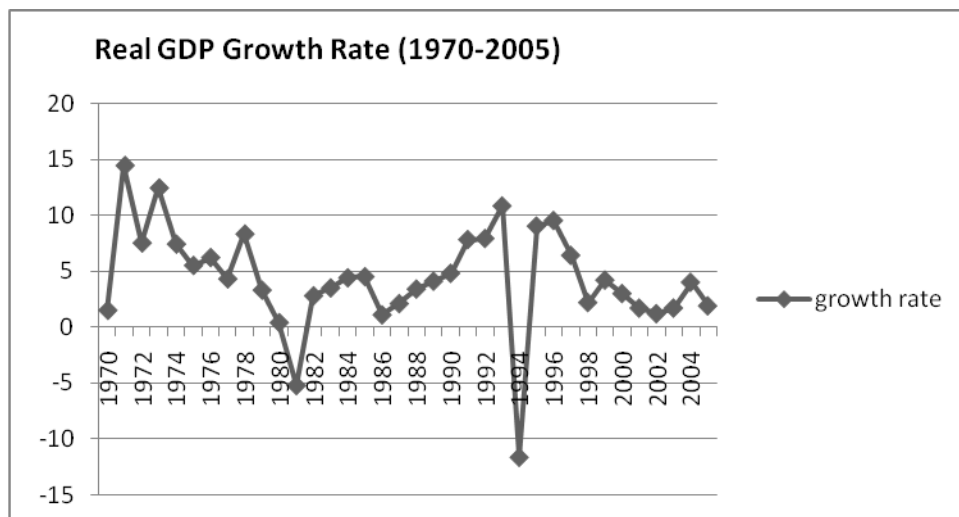
Financial sector reforms in Malawi are almost complete although there is a case for more far-reaching improvements. Implementation of financial reforms in Malawi has had a few pitfalls. Given the economic fragilities that pervade Malawi, feasible financial liberalization in Malawi would have been undertaken with a package that emphasized adherence to macroeconomic stability. Development of indirect monetary instruments and strengthening of the regulatory environment

and bank supervision would also be the necessary pre-requisites. Subsequently, the process would have required enhancement of competition among banks and development of the payment system, followed by development of secondary market for government securities, removal of direct controls and establishment of central bank autonomy. Financial liberalization and sequencing of reforms would ideally have started with interest rates liberalization, abolition of credit ceilings and the end to directed credit programs, and development of indirect monetary instruments. The program should have aimed to strengthen the regulatory framework from which increased competition in the financial sector would develop thereby increasing the efficiency of credit allocation.

2.3 Economic Growth Performance

Figure 2.3 below shows the trend in real GDP growth under the period of study. Beginning from its independence in 1964 up to mid 1970s, Malawi's economy recorded a steady growth rate in real gross domestic product (GDP) averaging about 6.5 percent annually. As can be seen from the figure below, this gradually slowed down over the years reaching 1.9 percent between 1976 and 1980.

Figure 2.3: Trends in real GDP growth rate



Source: RBM financial reports, World Bank development indicators

Malawi's period of remarkable economic growth, driven primarily by extensive growth in agricultural sector, came to a halt in the early 1980s. Dramatic declines

in terms of trade combined with droughts and the emergence of transport difficulties led to sharp declines in real GDP in 1980 and 1981, with the economy registering negative real GDP growth rates within those two years. In the emerging crisis, a number of factors were identified as sources of weaknesses in the economy. These included the following:

- Inefficiencies in the production sector as a result of price controls
- Poor performances in the smallholder agricultural sub-sector due to a pricing structure that favoured the large scale sub-sector
- Inefficient public enterprises due to unsystematic and wasteful investment
- A narrow export base comprising mainly tobacco, tea and sugar, all of which face adverse world market conditions
- The heavy import dependence of the industrial and energy sub-sector.
- A generally weak incentive framework and an overvalued exchange rate.

To deal with these constraints several reforms were undertaken by the government in conjunction with the World Bank in the form of Structural Adjustment Loans (SALs). Beginning 1981, the first SAL included policy reforms involving producer prices, export diversification and energy programme, reform of pricing of goods and services provided by parastatals and rationalization of network among Agricultural Development and Marketing Corporation (ADMARC), Malawi Development Corporation (MDC) and Press Corporation. These issues continued into the second SAL, which introduced other issues including liberalization of prices controlled by ministry of trade and industry. The third SAL introduced, among others, the estate sector credit facility, the phased elimination of the subsidy on smallholder fertilizer, completion of price decontrol programme, tax reform and the partial liberalization of smallholder produce.

As a result of these developments, some early signs of success began to show in 1982 as economic growth returned. During this recovery period, further external shocks buffeted the economy. In 1984 the rail link through Mozambique was cut off completely; the terms of trade took another nose-dive from a temporary peak

in 1984, driving down the dollar value of exports by 20 percent (World Bank 1982). These shocks led to two successive years of crisis in management in 1986 and 1987 that was manifested in failing GDP. Malawi adjusted to these additional external pressures primarily by resorting to tight exchange controls on imports.

A broad based recovery on output began in 1988 and continued through 1989. During the period 1986-1990 the growth in real GDP averaged 2.4 percent. This was aided by the restoration of fiscal discipline and relaxation of import controls, with increased imports of intermediate and capital goods financed by both higher external inflows (World Bank 1990). Due to several natural disasters in certain sectors of the country real GDP growth averaged 1.2 percent between 1999 and 1995. The economic situation in recent years has been weak but improving gradually. The real GDP growth declined from 4.6% in 2004 to 2.1% in 2005, due to a prolonged dry spell during the growing season in early 2005 and lack of adequate resources that negatively affected the agriculture sector. The figure below shows trends in real GDP growth for Malawi within the sample period.

The government has shown a strong commitment to improve fiscal performance and bring government expenditure under control and achieve a reasonable degree of economic stability. The most important achievement has been stopping fiscal latitude of the past which unfortunately left the country with a high domestic debt. The present fiscal policy aims at reducing the weight of government's domestic debt, while allowing for increases in pro-poor (health and education) and pro-growth (infrastructure) expenditure. Moreover spending in no-priority areas is being reduced and efficiency gains are being sought. Further Malawi has recently benefited from the achievement of the HIPC completion point, reached around mid 2006. This immediately allowed Malawi to qualify for further debt relief under the Multilateral Debt Relief Initiative thus reducing the pressure of the foreign debt and releasing resources for poverty reduction and economic development related activities.

CHAPTER THREE

LITERATURE REVIEW

3.1 Theoretical literature

Theoretical models, in general, conjecture that financial deepening affects economic growth via two avenues. First, financial deepening leads to an increase in the savings rate thereby increasing the resources available to finance investments. Second, financial development results in efficient allocation of savings hence enhancing the productivity of investment. The former effect is strongly emphasized by McKinnon (1973) and Shaw (1973).

Previous to the liberalization thesis the prevailing paradigm had been the development hypothesis view of finance. This model, which evolved from the works of Goldsmith (1969), Patrick (1966), among others, advocated that in the earliest stages of economic development proactive government interventions in the form of institution building, suppressed interest rates and directed credit policies were necessary to provide the financial impetus necessary for economic development. Through the supply-leading thesis, Patrick (1966) urged that financial institutions play a leading role in promoting growth by ensuring the availability of low cost credit to potential investors. Consequently, it was prudent to build institutions well in advance of demand for their services, and interventionist policies put in place to make finance a catalyst in real sector development. Patrick, however, acknowledged a demand-following thesis when he argued that the financial sector expands as a consequence of the demand created from growth within the real economy and is thus dependant on stimulation from market sources.

McKinnon (1973) and Shaw (1973) argued that policies that advocate low interest rates within relatively fixed policy regimes as a means of stimulating investment for greater output, savings, and employment have purely short-run orientations. They argued that financial repression in the form of interest rate

ceilings, exchange rate control, and other quantity rationing devices such as selective credit controls and reserve requirements distort impulses from the financial sector to the real sector by causing reductions in saving, encouraging capital flight, misallocation of resources, inappropriate choice of production techniques, fragmentation and decreased use of financial institutions as well as problems of monetary control. By so doing financial repression creates distortions, uncertainties and imperfect conditions that repress the development of both the financial and real sectors of the economy. The financial liberalization orthodoxy shifted emphasis from proactive government intervention to a framework based on a demand following rather than a supply-leading finance approach. They presented forceful arguments for greater reliance on the market to determine the rates of interest and the allocation of credit. This orthodoxy advised that with the rise in real interest rates, the rate of saving would increase substantially with financial incentive to save in banks. With increased savings, it is argued, the supply of loanable funds would increase and banks would be in a position to expand their loan portfolios while at the same time reducing their dependency on external support.

In the McKinnon–Shaw model, one of the major and important roles of financial institutions is to mobilize and aggregate savings. These savings might not be available for investment without the participation of financial institutions because mobilizing savings of disparate savers is usually costly due to the existence of information asymmetries and transaction costs. Financial institutions lower the cost of mobilizing saving by reducing the informational asymmetries, thus making savers comfortable with the idea of relinquishing immediate control of their funds, and by lowering the transaction costs by providing a variety of saving instruments for different savers including small-denomination instruments that attract small savers including individual households. McKinnon (1973) and Shaw (1973) argue that government policies that lead to financial repression, such as forcing financial institutions to pay low and sometimes negative real interest rates,

reduce the incentive to save. Reduced savings, in turn, result in lower investment and economic growth.¹¹

However, the McKinnon-Shaw hypothesis has not gone unchallenged. Taylor (1983) attacked it as being incomplete. He argued that the result and, hence, the conclusion obtained by McKinnon and Shaw depend crucially on a salient assumption on asset market structure, namely, that portfolio shift into bank deposits is coming out of an unproductive asset rather than from loans extended on the curb market. Using arguments based on fractional reserve banking practices, Taylor (1983) further noted that if informal market assets shift into bank deposits as a result of higher interest rates, total supply of credit to the business sector would decline as banks provide only partial intermediation. Prudential and other statutory reserve requirements would lead to an increase in reserves and consequently, a reduction of effective supply of funds as funds were moved out of informal financial markets that provide one for intermediation. Beneficiaries of credit in the informal market would be crowded out of the credit market as their source of credit dried up. Moreover, informal market rates would rise alongside the liberalized interest rates, implying higher prices for working capital. This would further crowd out marginal beneficiaries of credit out of investment opportunities.

Critics of financial liberalization policies have further argued that if information asymmetries are endemic to financial markets and transactions, in particular in countries with poor corporate governance and low legal protections, there is no reason to think that financial liberalization, either domestic or international, will be welfare improving (Stiglitz, 2000). Moreover, in countries where the capacity to honour contracts and to assemble information relevant to financial transactions is least advanced, there can be no presumption that capital will flow into uses

¹¹ While the main channel of transmission emphasized by the McKinnon and Shaw model is the effect of financial development on the level of savings, it also recognizes that positive interest rates make the allocation of investible funds more efficient, thus providing an additional effect on economic growth.

where its marginal product exceeds its opportunity cost. Stiglitz (1994) argues in favour of certain forms of financial repression. He claims that repression can have several positive effects such as: improving the average quality of the pool of loan applicants by lowering interest rates; increasing firm equity by lowering the price of capital; and accelerating the rate of growth if credit is targeted towards profitable sectors such as exporters or sectors with high technological spillovers.

A large body of literature also exists that highlights the efficiency-enhancing role of financial development. The most notable early works in this regard are Schumpeter (1911)¹² and Goldsmith (1969). Goldsmith (1969, p. 398) states; 'irrespective of whether or not the existence and development of a financial superstructure increases the aggregate volume of saving and investment and thus accelerates the rate of economic growth beyond what would have otherwise been, there is no doubt that it results in a differentiated allocation of capital expenditures among and within sectors, types of tangible assets, and regions'. Moreover, the recent interest in growth theory in general and the development of endogenous models in particular have provided the analytical framework in showing that financial development can have not only level effects but also positive growth effects through its effects on productivity. These models demonstrate that financial development improves productivity of investment in two major ways. One, by collecting and processing information needed to evaluate alternative investment projects hence improving the allocation of resources, and two, by providing opportunities to investors to diversify and hedge risks, thereby inducing individuals to invest in riskier but more productive investment alternatives. For example, Greenwood and Jovanovic (1990) highlight the capacity of financial institutions to acquire and analyze information about the state of technology and to channel investible funds into investment activities that yield the highest return. Similarly, King and Levine (1993b) show that financial institutions can boost the rate of technological innovations by identifying those

¹² The work of Schumpeter (1911) has been cited as the earliest notable study on the finance-growth nexus by several researchers. See Arestis, P. and Demetriades, P., (1997); Wachtel, Paul (2003); Ndebbio (2004)

entrepreneurs with the best chance of successfully identifying new goods and production processes. Bencivenga and Smith (1991), present a model in which the presence of effective financial institutions eliminate liquidity risks, hence reducing the need to hold savings in liquid but unproductive or highly liquid and low-return investments.

In sharp contrast however, Collier and Mayer (1989) argue that there is no guarantee that financial reform based on a market-based system would attain a significant level of competition and efficiency of the banking system in the domestic economy. Competition would not be possible if, a few banks dominate the banking sector, so that the risk of inefficiency associated with direct credit controls or government intervention in the banking sector before the reform is replaced by the inefficiency of an oligopolistic banking structure. Collier and Mayer argued that in many African countries where there are a small number of commercial banks controlling a large proportion of financial deposits in the banking sector, the pricing by one bank might have a significant impact on other smaller banks in the banking sector. In this instance, banks may prefer to hold proportionately large assets in liquid form rather than holding a diversified portfolio. They argued that the opening of the domestic financial markets to foreign competition will provide an incentive to the domestic banking institutions to adopt efficient means of delivering banking services.

3.1.2 The Role of the financial system in promoting economic growth

Financial markets are central in economic activity. Differences in the quantity and quality of services provided by domestic financial system may partially explain why some countries grow faster than the others. The intermediation role provided by financial institutions ensures that capital goes to its most productive use. In a large and comprehensive survey Levine (1997) presents more recent evidences on the importance of developed financial system and identifies five basic functions of financial intermediaries which give rise to such effects: savings mobilization, risk management, acquiring information about investment

opportunities, monitoring borrowers and exerting corporate control, facilitating the exchange of goods and services.

There are three basic characteristics of financial systems that are now regarded as capturing the impact of these five functions on economic growth; the level of financial intermediation, the efficiency of financial intermediation, and the composition of financial intermediation. These are now considered in turn.

The level of financial intermediation

The size of a financial system relative to an economy is important for each of the functions listed above. A larger financial system allows the exploitation of economies of scale, as there are significant fixed costs in the operation of intermediaries. As more individuals join financial intermediaries, the latter can produce better information with positive implications (externalities) for growth, a channel emphasised in some of the earlier theoretical models of the finance-growth literature (e.g. Greenwood & Jovanovic, 1990; Bencivenga & Smith, 1991). A larger financial system can also ease credit constraints: the greater the ability of firms to borrow, the more likely that profitable investment opportunities will not be by-passed because of credit rationing.

A large financial system should be more effective at allocating capital and monitoring the use of funds as there are significant economies of scale in this function. Greater availability of financing can also increase the resilience of the economy to external shocks, helping to smooth consumption and investment patterns. More generally, a financial system plays an important function in transforming and reallocating risk in an economy. Besides cross-sectional risk diversification, a larger financial system may improve intertemporal risk sharing (Allen and Gale, 1997). By expanding a financial system to more individuals there will be a better allocation of risk, which can in turn boost investment activity in both physical and human capital, leading to higher growth rates.

The efficiency of financial intermediation

The channels linking the size of the financial system and growth effectively assume a high quality of financial intermediation. The efficiency of financial systems, however, cannot be taken for granted, especially as information gathering is one of their key functions. asymmetric information, externalities in financial markets (Stiglitz and Weiss 1992) and imperfect competition (for example as a result of fixed costs can lead to sub-optimal levels of financing and investment, an inefficient allocation of capital, or have other undesirable consequences such as bank runs, fraud or illiquidity which are detrimental for economic growth. Some of these market imperfections may be best addressed through appropriate oversight by a public body but the legal and institutional background (including competition policy) may also foster the efficiency of financial markets and hence contribute to economic growth.

The composition of financial intermediation

Two important shifts in the composition of financial intermediation relate to the maturity of financing opportunities available and the growth of capital markets and institutional savers such as pension funds and insurance companies. The maturity of loans and bonds may affect the extent to which certain investments may be profitably exploited. On the other hand the replacement of banks by liquid markets appears to be a result of changes in the cost of intermediation. As noted by Jacklin (1987), there is no specific advantage to banks. If liquid markets exist, all agents will save through equities as they offer higher long-term returns. Indeed, the earliest corporate finance models even suggested the irrelevance of the choice of financing for company's investment needs (Modigliani and Miler, 1958).

One potential channel for the composition of financial intermediation to affect the efficiency with which firms allocate resources is through its impact on corporate governance. There are however no theoretical models that assess the role of markets as opposed to banks in boosting steady-state growth through heir

impact on corporate governance. Many researchers have observed the limited corporate governance capability afforded by markets either because of diffused shareholdings –which leads to managerial discretion – or because of the excessive power often exerted by controlling owners which can distort corporate decisions.

3.1.3 The Neoclassical Growth Model

The Neo-classical model was an extension to the Harrod-Domar model that included a new term, productivity growth. The most important contribution was probably the work done by Robert Solow in 1956. Solow extended the Harrod-Domar model by adding labor as a factor of production; requiring diminishing returns to labor and capital separately, and constant returns to scale for both factors combined; and introducing a time-varying technology variable distinct from capital and labor. The capital-output and capital-labor ratios are not fixed as they are in the Harrod-Domar model. These refinements allow increasing capital intensity to be distinguished from technological progress.

The key assumption of the neoclassical growth model is that capital is subject to diminishing returns. Given a fixed stock of labor, the impact on output of the last unit of capital accumulated will always be less than the one before. Assuming for simplicity no technological progress or labor force growth, diminishing returns implies that at some point the amount of new capital produced is only just enough to make up for the amount of existing capital lost due to depreciation. At this point, because of the assumptions of no technological progress or labor force growth, the economy ceases to grow.

Assuming non-zero rates of labor growth complicates matters somewhat, but the basic logic still applies- in the short-run the rate of growth slows as diminishing returns take effect and the economy converges to a constant ‘steady-state’ rate of growth (that is, no economic growth per-capita). Including non-zero technological progress is very similar to the assumption of non-zero workforce growth, in terms of ‘effective labor’: a new steady state is reached with constant

output per worker-hour required for a unit of output. However, in this case, per-capita output is growing at the rate of technological progress in the 'steady-state' (that is, the rate of productivity growth).

The Solow growth model can be described by the interaction of five basic macroeconomic equations: Macro-production function, GDP equation, Savings function, Change in capital, Change in workforce

Macro-production function

The mathematic formulation of the model is as follows

$$Y = AK^{\alpha} L^{1-\alpha}$$

This is a Cobb-Douglas function where Y represents the total production in an economy. A represents multifactor productivity (often generalized as technology), K is capital and L is labor.

An important relation in the macro-production function:

$$Y = AK^{\alpha} L^{1-\alpha} \leftrightarrow y = Ak^{\alpha}$$

Which is the macro-production function divided by L to give total production per capita y and the capital intensity k

GDP equation

$$Y = C + G + I + NX$$

Where C is private consumption, G is public consumption, NX is net exports, and I represents investments, or savings. Note that in the Solow model, we represent public consumption and private consumption simply as total consumption from both the public and government sector. Also notice that net exports and government spending are excluded from Solow's model. This equation is called the GDP equation because it is calculated much the same way as is the Gross domestic product (or more precisely the Gross national product).

Savings function

$$I = sY$$

This function depicts savings, I as a portion s of the total production Y . Change in capital is given as:

$$\Delta K = sY - \delta K$$

The δ is the rate of depreciation.

Change in workforce

$$L_{t+1} = L_t(1 + gL)$$

gL is the growth function for L .

to explain the model's solution, we will first need to define some growth functions.

1. Growth in capital $gK = \frac{\Delta K}{K}$

2. Growth in the GDP $gY = \frac{\Delta Y}{Y} - 1$

3. Growth function for capital intensity $gK = gK - gL$

Solution assuming no multifactor productivity growth

This simplification makes the solution's derivation more comprehensible, as it allows the following calculations:

$$gK = \frac{\Delta K}{K} \rightarrow \frac{sY - dK}{K} \rightarrow \frac{sY}{K} - d$$

When there is no growth in A then we can assume the following based on the first calculation:

$$gK = gL = gY$$

$$gK = \frac{sY}{K} - d$$

Divide the fraction by L and we see that $gK = \frac{sy}{k} - d$

$$gK = \frac{sy}{k} - d \rightarrow d \rightarrow \frac{sAk^\alpha}{k} \rightarrow d \rightarrow \frac{sA}{K^{1-\alpha}} - d$$

By subtracting gL from gK we end up with:

$$gK = \frac{sA}{k^{1-\alpha}} - (d + gL)$$

If k is known in the year t then this formula can be used to calculate k in any given year.

Deriving the Steady-state equation:

$$d(K/L)/dt = d(k)/dt$$

where: $k = K/L$ and k denotes capital per worker

Differentiating we obtain:

$$dk/dt = \left(\frac{dKL - dLK}{L^2} \right) / dt$$

$$dk/dt = (dK/L)/dt = - \left(\frac{dL}{L} \frac{K}{L} \right) / dt$$

we know that

$(dL/L)/dt$ is the population growth rate over time denoted by n .

Furthermore we know that

$$dK/dt = sY - xK$$

where x is the depreciation rate of capital.

Hence we obtain:

$$dk = sy - (n + x)k, \text{ which is the fundamental Solow equation}$$

The short-run implications of the model are that growth is affected only in the short-run as the economy converges to the new steady state output level. Also, the rate of growth as the economy converges to the steady state is determined by the rate of capital accumulation. Furthermore, capital accumulation is in turn determined by the savings rate and the rate of capital depreciation. With regard to long run implications, the long-run rate of growth is exogenously determined in (i.e. it is determined outside of the model). A common prediction of these models is that an economy will always converge towards a steady state rate of growth, which depends only on the rate of technological progress and the rate of labor

force growth. However, the model has not gone without some criticism. Empirical evidence offers mixed support for the model. Limitations of the model include its failure to take account of entrepreneurship (which may be catalyst behind economic growth) and strength of institutions (which facilitate economic growth). In addition, it does not explain how or why technological progress occurs. This failing has led to the development of endogenous growth theory, which endogenizes technological progress and/or knowledge accumulation.

3.3 Empirical Evidence

Besides theoretical studies there is a great deal of empirical research about the financial deepening-growth nexus. This section discusses several studies based on the type of dataset used.

3.3.1 Cross-country studies

The application of broad cross-country growth regressions to the study of finance and growth is examined first. These studies aggregate economic growth over long periods, a decade or more, and assess the relationship between long-run growth and measures of financial development.

The earliest examination of the relationship between finance and growth across countries was a 1969 study by Raymond Goldsmith.¹³ Goldsmith used the value of financial intermediary assets, relative to GNP, as a measure of financial development. Examining data on 35 countries over 103 years (1860 – 1963) he found that, in general, financial and economic development appeared to occur simultaneously. Goldsmith's measure of financial development would be correlated with the extent of financial services; it is less likely that it would be closely related to the quality of those services. Unfortunately, the paucity of data on the quality of financial services makes its measurement problematic for any study of financial development. A further difficulty in Goldsmith's study is that he

¹³ Levine (1997), Lynch (1996), and Wachtel (2003) contend that Goldsmith (1969) pioneered empirical work on the finance-growth relationship

did not control for the many other factors that, at least in part, determine the rate of economic growth. Economic theory indicates that a nation's propensity to save, supply of human capital, fiscal and monetary policy, political and economic stability, the rule of law, the rate of population growth, and the initial level of GDP are all possible determinants of an economy's rate of growth.

Perhaps the most thorough study of finance and growth in the tradition of Goldsmith is King and Levine (1993). This work remedied many of the problems of the original study. Acknowledging the lack of good measures of overall financial development, the authors examined a variety of alternatives. They used four measures. Two of these measures are intended to gauge the extent of the financial sector: liquid liabilities of the financial system as a fraction of GDP;¹⁴ and the quantity of credit provided to private enterprises, by both private-sector banks and the central bank, as a fraction of GDP. King and Levine also used two measures of the efficiency of the financial system. The first measured the share of total credit actually provided by private-sector banks instead of the central bank. The second measured the share of total credit allocated to private non-financial firms. Implicit in the use of these two measures is the belief that an economy with more lending by private-sector banks and more lending to private firms will have a more efficient allocation of external finance. A private-sector bank, seeking to maximize profits, is more likely to fund worthwhile investment projects than is a government lender that may have to follow another criterion for loan evaluation. King and Levine also used three separate measures of economic growth: the per capita growth rates of both GDP and the capital stock and the growth rate of total factor productivity.¹⁵ Finally, to isolate the effect of financial development, they controlled for several alternative determinants of economic development. That is, they evaluated the ability of the measures of financial development discussed above to explain that part of an economy's

¹⁴ Liquid liabilities of the financial system include currency held outside the banking system as well as demand and interest-bearing liabilities of banks and nonblank financial intermediaries.

¹⁵ Total factor productivity growth is the part of GDP growth that cannot be explained by changes in the capital stock or hours worked.

overall rate of growth not already explained by other factors. The authors found a positive and statistically significant relationship between their measures of financial development and economic growth; in other words, countries with higher levels of financial development tend to have higher economic growth and vice versa.

Ndebbio (2004) evaluated the impact of financial deepening and other growth related factors on growth in selected Sub-Saharan African (SSA) countries. Financial deepening was represented by two variables, the degree of financial intermediation/development and the growth rate in per capita real money balances. Because of lack of data on other measures of financial assets in most SSA countries, broad money (M2) was used as numerator for both variables. Estimations depending on the two measures of financial deepening and other explanatory variables of interest were done with an Ordinary Least Squares (OLS) multiple regression procedure. Three modelled equations, with justifications for each, were estimated and analysed. A cross-country regression was used for 34 SSA countries.¹⁶ To even out year-to-year fluctuations as well as reflect underlying structural changes, the variables were calculated on a decade average basis. Based on the results found, he concluded that financial deepening as represented by the growth rate of per capita (real/nominal) money balances and degree of financial intermediation does positively affect per capita growth of output.

Cross-country studies are however not without problems and this has been well documented in the literature. In particular, 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

¹⁶ The countries are: Benin, Burkina Faso, Burundi, Botswana, Burundi, CAR, Chad, Congo, Cote d'Ivoire, Ethiopia, Gabon, The Gambia, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda, Zaire, Zambia, Zimbabwe

inconsistent and misleading estimates.¹⁷ In light of these problems recent empirical studies have used dynamic panel data methods, such as the first differenced generalized methods of moments (GMM), as a way to control for the potential sources of biased coefficient estimates in cross-country regressions.¹⁸ These studies are discussed next.

3.3.2 Panel studies of finance and growth

Compared with purely cross-country approaches, the panel approach has several important advantages. The first benefit from moving to a panel is the ability to exploit the time-series and cross-sectional variation in the data. Moving to a panel incorporates the variability of the time-series dimension, exploiting substantial additional variability. A second benefit from moving to a panel is that in the purely cross-sectional regression, the unobserved country-specific effect is part of the error term so that correlation between the unobserved country specific effect and the explanatory variables results in biased coefficient estimates. To control for the presence of unobserved country-specific effects, Arellano and Bond (1991) propose to “first-difference” the regression equation to eliminate the country-specific effect and then use instrumental variables to control for endogeneity. This approach eliminates biases due to country-specific omitted variables.

Levine et al (2000) used panel techniques to study the relationship between financial intermediary development and growth and extend their work to evaluate the relationship between financial development and the sources of growth, i.e., productivity growth and physical capital accumulation. They used many indicators of financial intermediary development and various conditioning information sets to assess robustness (Levine and Renelt, 1992). Their results indicated a positive relationship between the exogenous component of financial

¹⁷ see Quah, (1993); Casselli *et al.*, (1996)

¹⁸ see Levine et al., (2000)

development and economic growth, productivity growth, and capital accumulation.

Remarkably, the coefficient estimates for the panel estimates are very similar to those obtained using pure cross-sectional data. Thus, the large, positive relationship between economic growth and private credit does not appear to be driven by simultaneity bias, omitted country-specific effects, or other problems plaguing cross-country growth regressions.¹⁹

The results of panel-data studies provide evidence of strong connection between the exogenous component of financial development and long-run economic growth. But, although the techniques represent econometrically significant improvement over the pure cross-country methods, a common feature of these estimation methods is that they impose cross-sectional homogeneity on coefficients that in reality may vary across groups. In particular, it is assumed that the slope coefficient is identical across the countries included in the panel, which implies that financial development generates equivalent investment and productivity increase across countries.²⁰

3.3.3 Time Series studies

Recognition of the methodological weaknesses of the cross-country regression analysis has prompted researchers to rely on 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 [financial development and economic growth] relationship across countries and may illuminate important details that are hidden in averaged-out results.'²¹

¹⁹ Beck, Levine, and Loayza (2000) go on to argue that the finance-capital accumulation link is not robust to alternative specifications, but financial development is robustly linked with both economic growth and productivity growth.

²⁰ The only heterogeneity considered is in the constant term.

²¹ See Arestis et al., 2001, p. 17.

Demetriades and Hussein (1996) provide a thorough investigation of time series studies. The results provided evidence of bidirectional causal relationships between financial development and economic growth. Their study, however, for the most part, focused on high-income and middle-income developing countries and there is a relative absence of sub-Saharan African countries in the sample of countries studied, making it difficult to generalize their results across all developing countries. This is so because economic theory is ambiguous on the issue of whether the effectiveness of financial development in promoting economic growth depends on the structure or level of development of the economy. There are those who argue that, in a given economy, it is the sector with high economies of scale that benefits more from financial development (Beck, 2002), implying that financial development is much more effective in promoting economic growth in more industrialized economies than in less industrialized or agricultural economies. On the other hand, there are those who contend that countries at their early stage of development benefit more from financial development.²² 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. (1997, 1998, 1999) find that the legal system plays a crucial role in determining the financial development and growth relationships. They argue that secure property and contract rights are key for banks and financial institutions to work properly, while weak contract enforcement creates incentives for default by debtors and decreases willingness to lend. On the other hand, corruption in the banking system or political interference may divert credit to unproductive or even wasteful activities,²³ again implying that economies with developed institutions are likely to benefit more from financial development. All of these suggest the need to conduct similar studies for countries at different stages of development in

²² See McKinnon, 1973, Ch. 2; Fry, 1995

²³ Levine et al. (2000) show that cross-country differences in legal and accounting systems help determine differences in financial development.

order to reach a more valid conclusion about the role of financial development in economic growth across countries

Kar and Pentecost (2000) examined the causal relationship between financial development and economic growth in Turkey. Five alternative proxies for financial development were developed and Granger causality tests applied using the cointegration and vector error correction methodology (VECM). The empirical results showed that the direction of causality between financial development and economic growth in Turkey is sensitive to the choice of proxy used for financial development. For example, when financial development is measured by the money to income ratio the direction of causality runs from financial development to economic growth, but when the bank deposits, private credit and domestic credit ratios are alternatively used to proxy financial development, growth is found to lead to financial development. On balance, however, for Turkey, growth seems to lead financial sector development.

Hussein (2001) examined the relationship between the development of the financial sector and economic growth as a whole in Egypt. His findings confirmed the importance of the development of the financial sector for economic growth where a rise in the ratio of private credit to total credit (used as a proxy for financial deepening) led to an increase in the real GDP per capita growth in the long run. He also showed that there are several instruments for developing the financial sector in Egypt, other than financial liberalization, including the development of the stock market, encouraging competition and participation of the private sector, and providing a variety of financial assets may play a more important role in boosting the financial sector.

Ghali (1999) investigated empirically the question whether financial deepening leads to economic growth in the small, developing country of Tunisia. The study focused on the causal link between finance and economic growth in order to discriminate against several alternative theoretical hypotheses. Unlike many

studies, Ghali (1999) did not use the ratio of money stock to GDP to represent financial deepening but rather employed the ratio of bank deposit liabilities to nominal GDP, and the ratio of bank claims on the private sector to nominal GDP. However, even with different proxies for financial development, the empirical results suggested the existence of a stable long-run relationship between each financial development ratio and per capita real output which is consistent with causality running from finance to economic growth.

CHAPTER FOUR

METHODOLOGY

4.0 Conceptual Framework

This study adopts the formal neoclassical growth model which has been reviewed in the previous chapter, by incorporating financial deepening into it. The simple neoclassical growth model has capital and labour as the only explanatory variables and it exhibits constant returns to scale or is linearly homogenous.²⁴ However, increasing returns to scale are often observed and, that being the case, most economists have argued that it is proper to stick with the unrestricted or augmented neoclassical model to which other variables are added.²⁵ Being the main objective in this study, real per capita growth of output will be related to variables making up financial deepening. These include the ratio of quasi money to GDP and the ratio of private credit to total domestic credit. Besides these monetary variables, the study will also include other explanatory variables such as human capital, inflation, trade openness and investment.

Estimation will be done through an Ordinary Least Squares (OLS) multiple regression procedure and using Eviews 3.1 software package. The study will employ an annual dataset covering the period between 1970 and 2004.

4.1 Model Specification

The model to be employed is a modification of the one used by Ndebbio (2004) in a cross-country regression analysis on selected sub-Saharan African countries. Ndebbio's model is reproduced in appendix. This study will run the equation below which is a log-log model and essentially allows us to interpret the results as elasticities.

²⁴ This implies that if inputs are changed proportionately then output will change by the same proportion.

²⁵ 1972; Easterly and Levine, 1994; Elbadawi and Ndulu, 1994; King and Levine, 1993a,b

$$\ln RGDP = \beta_0 + \beta_1 \ln QMGDP + \beta_2 \ln PC + \beta_3 \ln INF + \beta_4 \ln FTY + \beta_5 \ln HC + \beta_6 \ln INV + \beta_7 DUM + \varepsilon_t \dots \dots (4.1)$$

4.2 Definitions of Variables

The variables in the model above are

4.2.1 Real per capita GDP (LnRGDP)

This is the natural logarithm of real Gross Domestic Product divided by population.

4.2.2 LnQMGDP

QMGDP is the natural logarithm of ratio of quasi money to GDP and it is representing the financial saving aspect of financial deepening . Financial liberalization is likely to lead to an increase in interest rates which would, in turn, increase the rate of saving as people will now be encouraged to save in banks. With increased savings, banks are more likely to increase their supply of loanable funds. Effective allocation of savings to the best investments will in turn lead to increased productivity and potentially faster economic growth. Its coefficient (β_1) is therefore expected to be positive.

4.2.3 LnPC

This is the natural logarithm of ratio of credit to the private sector to total domestic credit. This indicator is frequently used to provide direct information about the allocation of financial assets. Credit to the private sector is eventually responsible for the quantity and quality of investment and therefore to economic growth. Therefore this ratio is a good estimate of the proportion of domestic assets allocated to productive activity in the economy. Its coefficient is thus expected to be positive.

4.2.4 LnINF

This is the natural logarithm of rate of inflation as measured by the percentage changes in the consumer price index (CPI) and it is expected to have a negative coefficient. Policy makers typically believe that inflation has important adverse effects on long-run economic performance. The reason for this, as noted by Fischer and Modigliani (1978) is that firms and workers devote productive resources to deal with inflation. They further note that inflation uncertainty reduces efficiency by discouraging long-term contracts and increasing relative price variability. A high and unpredictable rate of inflation generally results in poor performance of businesses and households. Fischer (1993) presents cross-sectional and a panel regression showing that growth is negatively associated with inflation.

4.2.5 LnFTY

This is the natural logarithm of trade openness and is represented by the ratio of the sum of exports and imports to GDP. Trade openness is expected to have a positive coefficient. Economies that are open are generally in a better position to adopt new technologies and new ideas from the rest of the world. In addition, they are likely to have a greater division of labour and production processes that are more consistent with their comparative advantages, which enable them to grow faster. Trade lets an economy make better use of its resources, by allowing imports of goods and services at a lower cost than they could be produced at home.

4.2.6 LnHC

This is the natural logarithm of human capital and is represented by the sum of enrollment levels in primary, secondary and tertiary education levels. Human capital is expected to have a positive sign. A country with human capital measured in terms of education level is better equipped to acquire and adapt efficient technologies. A well developed labour force, in terms of better education

is likely to be able to produce more from a given resource base, than less-skilled workers.

4.2.7 LnINV

LnINV is the natural logarithm of investment and is proxied by gross fixed capital formation as a share of GDP. The coefficient of investment is expected to be positive.

4.2.8 DUM

DUM is a Dummy variable representing financial Liberalization. It takes the value of 0 before liberalization and 1 thereafter.

4.3 Data Sources

The study will use data from the following sources: Financial and Economic Review (various editions), Reserve Bank of Malawi; Malawi government Annual Economic Reports (various editions), International Monetary Fund Financial Statistics; and World Bank Development Indicators. The data used in the study are presented in appendix 7.

4.4 Stationarity

The assumptions of the classical regression model require that both the dependent variable and regressors be stationary and that the errors have a zero mean and finite variance. In the presence of nonstationary variables, there might be what Granger (1974) called a spurious regression, whereby the results obtained suggest that there are statistically significant relationships between the variables in the regression model when in fact all that is obtained is evidence of a contemporaneous correlation rather than meaningful causal relations. Thus before estimating a regression, variables must be found stationary individually, or if both variables are nonstationary, they must be cointegrated.

4.4.1 The Dickey-Fuller Test for Unit Roots

Dickey and Fuller (1979) devised a procedure to formally test for non-stationarity. The key insight to their test is that testing for non-stationarity is equivalent to testing for the existence of a unit root. Thus the obvious test is the following which is based on the first order autoregressive model of the form:

$$Y_t = \alpha Y_{t-1} + \varepsilon_t$$

What we need to examine here is whether α is equal to 1 (unity and hence 'unit root'). The null hypothesis is $H_0 : \alpha = 1$, and the alternative hypothesis is $H_1 : \alpha < 1$.

A different but more convenient version of the test is obtained by subtracting Y_{t-1} from both sides of the equation above

$$Y_t - Y_{t-1} = \alpha Y_{t-1} - Y_{t-1} + \varepsilon_t$$

$$\Delta Y_{t-1} = (\alpha - 1) Y_{t-1} + \varepsilon_t$$

$$\Delta Y_{t-1} = \lambda Y_{t-1} + \varepsilon_t$$

where $\lambda = (\alpha - 1)$. Then, now the null hypothesis is $H_0: \lambda = 0$ and the alternative hypothesis $H_1: \lambda < 0$ where if $\lambda = 0$ then Y_t follows a pure random walk.

4.4.2 The Augmented Dickey-Fuller (ADF) Test

As the error term is unlikely to be white noise, Dickey and Fuller extended their test procedure suggesting an augmented version of the test which includes extra lagged terms of the dependent variable in order to eliminate autocorrelation. The lag length on these extra terms is either determined by the Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SBC), or more usefully by the lag length necessary to whiten the residuals. In our case, the logs of the variables used in the study were subjected to unit root tests using the ADF test and the results are reported in table 4.1 below:

Table 4.1 Unit Root Test Results

Variable	ADF in levels	ADF in first differences	Order of integration
GDP	-1.291170	-4.510898	I (1)
QM GDP	-2.758127	-3.999172	I (1)
PC	-2.407505	-4.494570	I (1)
INF	-2.090957	-5.248427	I (1)
FTY	-2.715041	-6.510898	I (1)
HC	-1.029314	-3.589620	I (1)
INV	-0.954180	-5.146671	I (1)

McKinnon critical values for rejection of hypothesis of a unit root in levels⁺, and first difference*

1% critical value	-3.6896 ⁺	-3.6422*
5% critical value	-2.9558 ⁺	-2.9527*
10% critical value	-2.6164 ⁺	-2.6148*

The results in the table above show that the logs of the variables in levels are non-stationary and they become stationary after differencing them once. This means that they are integrated of order one.

4.4.3 Cointegration

Non-stationary data leads to spurious regressions. One way of resolving this is to difference the series successively until stationarity is achieved and then use the stationary series for research analysis. However, this solution is not ideal. Applying first differences of the data leads to loss of long-run properties, since the model in differences has no long-run solution. The desire to have models which combine both short-run and long-run properties, and which at the same time maintain stationarity in all of the variables, has led to a consideration of the

problem of regression using variables that are measured in their levels.²⁶ The basic idea is that if there are economic time series that are integrated and of the same order (which means they are non-stationary), which we know are related (mainly through a theoretical framework), it is possible to combine them together into a single series which is itself non-stationary. The series that exhibit this property are said to be cointegrated.²⁷

In order to test for cointegration, Granger (1981) introduced a remarkable link between non-stationary processes and the concept of long-run equilibrium; this link is the concept of cointegration defined above. Engle and Granger (1987) further formalised this concept by introducing a simple test for the existence of cointegration.²⁸ By definition, cointegration necessitates that the variables be integrated of the same order as is the case with our variables. The next step is to estimate the long-run equilibrium relationship and obtain the residuals of this equation. These residuals are denoted ECT (error correction term). Finally, we check the order of integration of the residuals using the ADF test. It is important to note that the critical values for the cointegration test (the ADF test on the residuals) are not the same as the standard critical values of the ADF test provided by MacKinnon (1991). In fact in order to have more robust conclusions regarding the evidence of cointegration, the critical values are more negative than the standard ADF ones.²⁹ The results from the cointegration test are presented below:

ADF Test Statistic	-3.650245	1% Critical Value*	-3.73
		5% Critical Value	-3.17
		10% Critical Value	-2.91

*Engle and Granger critical values for rejection of hypothesis of a unit root.

²⁶ See Asteriou (2005)

²⁷ The concept of cointegration was first introduced by Granger (1981) and elaborated by Engle and Granger (1987), and Johansen (1988, 1991) among others.

²⁸ The test is called The Augmented Engle-Granger Test.

²⁹ Engle and Granger (1987), in their seminal paper, performed Monte Carlo simulations in order to construct critical values for the cointegration test.

The results above indicate that the deviations from long-run equilibrium are found to be stationary at 5% significance level and we reject the null hypothesis that the variables are not cointegrated. Now that we have established that the variables are cointegrated, the residuals from the equilibrium regression can be used to estimate the error-correction model to which we now turn to and to analyse the long-run and short-run effects of the variables.

4.4.4 Error Correction Mechanism (ECM)

When we regress an equation whose variables have been made stationary by differencing, the model will give us correct estimates of the parameters and the spurious equation problems would have been resolved. However, what we would have from such an equation is only the short-run relationship between the variables. Knowing that economists are generally interested in long-run relationships, this constitutes a big problem, and in order to resolve this the concept of cointegration and error-correction model (ECM) are very useful. According to Granger's (1986) Representation Theorem, a system of cointegrated variables can be represented by a dynamic error-correction model. Specifically, to the model containing stationary variables, we add the residuals (lagged once) that are obtained from the underlying cointegrating (long-run) relation. These residuals are called the error correction term whose coefficient reflects the process by which the dependent variable adjusts in the short-run to its long-run equilibrium path.³⁰

If y_t and x_t are cointegrated, by definition, the error term obtained from regressing y_t on x_t is stationary. Thus we can express the relationship between y_t and x_t with an ECM specification as:

$$\Delta y_t = \beta_0 + \lambda_1 \Delta x_t - \alpha \varepsilon_{t-1} + \mu_t$$

³⁰ Additional lags of the error-correction term are unnecessary since they are already reflected in the distributed lags of the other explanatory variables. See Miller (1991).

which will now have the advantage of including both long run and short-run information. In this model, λ_1 is the impact multiplier (the short-run effect) that measures the immediate impact that a change in x_t will have on a change in y_t . On the other hand, α is the feedback effect, or the adjustment, and shows how much of the disequilibrium is being corrected, i.e. the extent to which any disequilibrium in the previous period effects any adjustment in the y_t period.

The ECM is important and popular for various reasons. Firstly, it is a convenient model of measuring the correction from disequilibrium of the previous period, which has a very good economic implication. Secondly, since ECMs are formulated in terms of first differences, which typically trends from the variables involved, they resolve the problem of spurious regression. Thirdly, ECMs can fit into the general-to-specific approach to econometric modeling, which is in fact a search for the most parsimonious ECM model that best fits the given data sets. Finally, the most important feature of the ECM comes from the fact that the disequilibrium error term is a stationary variable (by definition of cointegration). Because of this, the ECM has important implications: the fact that the two variables are cointegrated implies that there is some adjustment process, which prevents the errors in the long-run relationship becoming larger and larger.

4.5 Diagnostic tests

The following diagnostic tests were carried out to verify the appropriateness of the model.

4.5.1 The Breusch-Godfrey Serial Correlation LM Test

This test is generally used for higher order serial correlation. In this test, the order p is specified, which is thought to be determining the disturbances. This study tested the presence of second order autocorrelation. The null hypothesis of the test is that there is no serial correlation in the residuals up to the specified order.

A significant $N \cdot R^2$ implies autocorrelation problems.³¹ The results of this test are reproduced below for the short and long run models respectively:

Breusch-Godfrey Serial Correlation LM Test: (long-run model)

F-statistic	1.652733	Probability	0.211773
Obs*R-squared	1.004358	Probability	0.605211

Breusch-Godfrey Serial Correlation LM Test: (ECM)

F-statistic	0.064549	Probability	0.937675
Obs*R-squared	0.195520	Probability	0.906867

As the results above indicate, the Observed *R-squared is insignificant at 5 percent level and the test fails to reject the hypothesis of serial correlation up to order two.

4.5.2 The White Heteroscedasticity Test (no cross terms)

This test is applicable only to the residuals from the least squares regression. It tests the null hypothesis that the coefficients of the variables in the augmented regression are all zero. Ordinary least squares estimates are consistent in the presence of Heteroscedasticity, but the conventional computed standard errors are no longer valid. This is also a general test for model misspecification, since null hypothesis underlying this test assumes that the errors are both homoscedastic and independent of the regressors and that the linear combination of the model is correct. Failure of any one of these conditions could lead to a significant test statistic. Conversely, a non-significant test statistic implies that none of the three conditions is violated.

White Heteroskedasticity Test (long run model)

F-statistic	0.916008	Probability	0.55299
Obs*R-squared	12.66508	Probability	0.47402

³¹ $N \cdot R^2$ is equal to the number of observations times R-square. It has an asymptotic Chi-square distribution under the null hypothesis.

White Heteroskedasticity Test: (ECM)

F-statistic	0.716773	Probability	0.73781
Obs*R-squared	12.86096	Probability	0.61307

In our results, the $N \cdot R^2$ is non-significant implying that we fail to reject the null hypothesis of no Heteroscedasticity. This means that the errors are homoscedastic.

4.5.3 The Histogram Normality Test

This tests whether the residuals follow a normal distribution or not. The null hypothesis for the test is skewness is equal to zero and kurtosis is equal to three. The test uses the Jargue-Bera statistic³² under the null hypothesis of normality. If the residuals are normally distributed, the histogram should be bell-shaped and the Jargue-Bera statistic should not be significant. In our results this test is applied on residuals and the test statistic (0.729428) is not significant (probability of 0.694395) and we fail to reject the null hypothesis of normality in both models.³³ This implies that the residuals follow a normal distribution.

4.5.4 Ramsey's RESET Test³⁴

The Ramsey's Reset Test is a general test for specification errors, which include the following: omitted variables, incorrect functional form, and correlation between explanatory variables and the residuals. Under such specification, least square estimators will be biased and inconsistent, and conventional inference procedures will be invalidated. The F statistic tests the hypothesis that the coefficients on the forecast vectors are all zeros. The results of the two models starting with the long run model are presented below:

Ramsey RESET Test: (long run model)

F-statistic	1.919193	Probability	0.168580
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³² The Jargue-Bera statistic has a chi-squared distribution with two degrees of freedom under the null hypothesis of normally distributed errors.

³³ See appendix I for the results of the test

³⁴ RESET stands for Regression Specification Error Test and was proposed by Ramsey (1969)

Log likelihood ratio	5.192671	Probability	0.074546
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Ramsey RESET Test: (ECM)

F-statistic	1.375934	Probability	0.272627
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Log likelihood ratio	3.842441	Probability	0.146428
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From the results above, the F statistic for both models is not significant implying that the model is correctly specified.

4.5.5 The CUSUM Test

The CUSUM test is a test for the stability of the model. It is based on the cumulative sum of the recursive residuals. This test plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines. The results of this test are shown in the appendix. The cumulative sums are within the area between the two critical lines indicating that the parameters are stable.

CHAPTER FIVE

EMPIRICAL RESULTS AND INTERPRETATION

5.1 Empirical Results

In the preceding chapter it was established that there exists a long-run relationship between the dependent variable and the explanatory variables or that the variables are cointegrated. This chapter presents the empirical results and an interpretation of the same.

5.1.1 The Long Run Model

We begin our empirical investigation by reporting the regression results of the estimated long-run equation using Ordinary Least Squares (OLS). The results are presented in table 5.1 below.

Table 5.1 Regression output of the long-run model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	5.160122	1.346828	3.881316	0.0007
QM GDP	0.105707	0.044181	2.392590	0.0256
PC	0.113975	0.028624	3.981816	0.0005
FTY	0.242469	0.078553	3.086692	0.0046
INF	-0.006718	0.020495	-0.327792	0.7456
HC	0.287204	0.099404	2.889158	0.0075
INV	0.173519	0.043116	4.024469	0.0004
DUM	0.148321	0.046134	3.215026	0.0034
R-squared	0.949524		Durbin-Watson stat	1.979589
Adjusted R-squared	0.869967		Akaike info criterion	-3.131057
F-statistic	54.61962		Schwarz criterion	-2.337631
Prob (F-statistic)	0.000000		Log likelihood	68.53139

Table 5.1 above presents the results of the static long run model. The adjusted R-squared of 0.87 means that the regressors in the model account for 87 percent of the variability in the dependent model.

The results in the table indicate that in the long run the ratio of quasi-money to income affects the level of per capita GDP positively. This implies that in the long run, financial deepening as represented by the ratio of quasi money to GDP are positively related. Specifically, a 1 percent increase in the level of quasi money leads to an increase of 10 percent.

The ratio of private credit to total domestic credit which is another variable that has been used to represent financial deepening also affect the level of real per capita real GDP positively. Specifically an increase of one percent in LnPC increases the level of real GDP by 11 percent. This means that financial deepening as represented by the two variable influences the level of real GDP.

The results also show that the coefficients of human capital and investment have positive signs. This means that in the long run, investment and human capital positively affect the level of real GDP. The coefficient of trade openness is also significant and has a positive sign. This implies that in the long run, trade openness impacts positively on the level of real GDP. Although not significant, inflation as expected has been found to exert a negative influence on the level of GDP. The coefficient of the dummy variable representing financial liberalization is positive meaning that in the long run, the process of financial liberalization promotes the level of real GDP.

5.1.2 The Short Run Model

As Adam (1991) asserts, the information about the dynamic process around the static long run model is contained in an over-parameterized model. Consequently, a general over-parameterized model was estimated. The results of the over-parameterized are displayed in appendix 6. It is however difficult to

interpret these results and the over-parameterized model was reduced to achieve a parsimonious model by eliminating lags that were not significant. Following the 'general-to-specific' dynamic modeling approach that the study adopted, we started from the most 'general' model, including all possible lags and variables, based on previous research evidence, economic theory and data frequency. We then proceeded with a simplification process, which sequentially reduced the general model to a simpler model. The simplification was based on imposing restrictions on the more general model, and its validity was ensured by the F-type tests and an improvement (or no deterioration) of the equation's standard error. Diagnostic tests were frequently applied to the general model and the simpler models to ensure that the underlying assumptions of the models were not violated (i.e. there was no mis-specification). The diagnostic statistics also provided an indication of possible directions of model reduction and reparameterisation. The simplification process continued in this fashion, until we reached the most parsimonious version of the model, presented in table 5.2 below, which gave sufficient economic interpretability while at the same time satisfying the diagnostic tests for the statistical assumptions.

Table 5.2 above presents the parsimonious error correction mechanism estimation output. The adjusted R-squared of 0.76 means that 76 percent of the variability in the dependent variable is explained by the regressors. Furthermore, the error correction term is significant and has the expected negative sign. Its coefficient of -0.68 implies that 68 percent of the variability in the dependent variable adjust in the short run to its long run equilibrium path

Table 5.2 Regression output of the Error Correction Model (ECM)

Variable	Coefficient	Std. Error	t-statistic	Prob.
Constant	13.22266	0.025450	5.195481	0.0000***
Δ QMGDP (-2)	0.029653	0.006989	4.242816	0.0008***
Δ QMGDP (-3)	0.032685	0.006298	5.190053	0.0001***
Δ PC	0.343093	0.140776	2.437147	0.0350**
Δ PC (-1)	0.365622	0.128609	2.842901	0.0130**
Δ INF	-0.109388	0.022994	-4.757291	0.0003***
Δ INF (-2)	-0.098102	0.024376	-4.024609	0.0013***
Δ FTY (-2)	0.397336	0.125578	3.163275	0.0069***
Δ HC (-2)	0.705057	0.146828	4.801928	0.0006***
Δ INV	-0.106241	0.042260	-2.514022	0.0248**
Δ INV (-2)	-0.095750	0.029345	-2.326042	0.0355***
DUM	0.404054	0.024832	16.27172	0.0000***
ECT (-1)	-0.614279	0.164181	-3.218324	0.0033***
R-squared	0.884378	Mean Dependent Var 13.49732		
Adjusted R-squared	0.766525	S.D. dependent Var 0.263292		
S.E. of regression	0.048172	Akaike info criterion -2.926220		
Log likelihood	62.35641	Schwarz criterion -2.139840		
Durbin Watson stat	2.059326	F-statistic 55.13685		
		Prob(F-statistic) 0.000004		

*** Significant at 1 percent, ** Significant at 5 percent, * Significant at 10 percent

The coefficient of the ratio of Quasi-Money to GDP is significant in the short run when it is lagged twice and it has the expected positive sign. The positive sign

suggests that growth of financial deepening as represented by the degree of financial saving impacts positively on economic growth. In the short run an increase of one percent in the ratio of Quasi-money to GDP increases growth of real GDP by 2 percent and 3 percent when the variable is twice and three times respectively. These results are consistent with the findings of other previous studies such as those by Kar and Pentecost (2004), Ndebbio (2004), King and Levine (1993a) who also found that financial deepening affects the growth of real GDP.

The coefficient of growth of credit to the private sector in the short run just like in the long run has the expected sign, and is significant. In the short run, a 1percent increase in the growth of credit to private sector leads to an increase of 32 percent in the growth of real GDP and the coefficient becomes larger as we include successive lags to the variable. This finding supports the view of Gregorio and Guidotti (1995), Demetriades and Hussein (1996) who found a positive relationship between ratio of private credit to total domestic credit and concluded that this variable is most evidently related to the quantity and efficiency of investment and hence to economic growth.

The coefficient of inflation is significant in the short run only and remains so after introducing lags. In the short run, a reduction in the rate of inflation of 1percent leads to an increase in the growth of GDP of 10 percent. Although the relationship between inflation and economic growth is regarded far from settled, the findings of this study conform to the findings of monetarists such Fischer (1993), Barro (1998) and Bruno and Easterly (1998) who found a negative impact of inflation on economic growth. Inflation impedes efficient resource allocation by obscuring the signaling role of relative price changes, an important guide to efficient economic decision-making.

The coefficient of trade openness is significant and the sign is positive. The finding is in line with the new growth theory, which has provided important insights into understanding the relationship between trade and growth. If growth

is driven by research and development activities, for example, then trade provides access for a country to the advances of technological knowledge of its trade partners. Further, trade allows producers to access bigger markets and encourages the development of research and development through increasing returns to innovation. Especially, trade provides developing countries like Malawi with access to investment and intermediate goods that are vital to its development processes.

The growth of human capital has a significant coefficient in the short term as was the case in the long term. It also has the expected positive sign in both cases. The study therefore rejects the null hypothesis that the quality of labour in the form of human capital does not affect economic growth. Human capital affects growth positively as skilled workers are more productive than non-skilled workers with any given technology. Skilled workers are better able at creating, absorbing and implementing new technologies, thereby generating growth. The quality of labour therefore makes an important contribution to economic growth.

In the short run, the ratio of investment to growth of GDP which is the capital-output ratio, shows the amount of units of capital that are needed to produce a certain level of output. In the short run, this coefficient therefore is measuring the efficiency of investment. According to the Harrod-Domar model of economic growth, the economy's rate of growth depends on the level of savings and the productivity of investment (i.e. the capital-output ratio). The lower the capital-output ratio the more productive is the capital and the higher is the economic growth.³⁵ Our results show that the coefficient is significant and has the expected negative sign. This means that in the short run the economy was utilizing resources well and hence promoting economic growth.

³⁵ The Incremental Capital-Output Ratio (ICOR) is the ratio of investment to growth which equals the inverse of marginal product of capital. The higher the ICOR, the lower is the productivity of capital. The ICOR can be thought of as a measure of the inefficiency with which capital is used.

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATIONS

6.1 Summary and Conclusions

The overriding objective of this study was to investigate empirically the relationship between financial deepening and economic growth in Malawi using time series data covering the period 1980-2004. The study used two proxies of financial deepening; the ratio of quasi money to GDP to represent the financial saving aspect of financial deepening and the ratio of private credit to total domestic credit which captured the aspect of domestic asset distribution and the degree of financial intermediation of the economy. The study also took into account the possible impacts of inflation, human capital, trade openness, and investment on economic growth.

The Ordinary Least Square (OLS) method was used for estimation after ensuring that none of the assumptions that underlie this method were violated. Before estimation, the variables were subjected to a unit root test using the Augmented Dickey Fuller (ADF) test and it was confirmed that all the variables were non-stationary. As such they were differenced to avoid estimating a spurious regression. It was confirmed that all the variables were integrated of order one. Further, the Engle-Granger test was used to test if the I(1) variables were cointegrated. Having established that the variables were cointegrated, an error correction mechanism was used to examine short run dynamics and correct for short run disequilibrium.

The study established that in the long run the ratios of quasi-money to GDP and private credit to total domestic credit are significantly different from zero. This means that financial deepening is an important determinant of growth and these results provide strong support for the theoretical contention that financial deepening shares a robust long-run relation with economic growth. Furthermore,

human capital, trade openness and investment positively affect economic growth. Inflation however does not affect economic growth in the long run.

In the short run, the coefficients of the variables representing financial deepening are significantly different from zero mean meaning that financial deepening has an immediate impact. In addition, the growth of human capital and the growth of investment also affect growth positively in the short run. Unlike in the long run, however, the coefficient of growth of trade openness is not significantly different from zero implying that growth of trade openness does not exert any impact on economic growth in the short run. The coefficient of inflation too behaves differently in the short run. Unlike in the long run the coefficient of inflation is significant and has a negative sign.

6.2 Policy Implications

The empirical findings of the study have several policy implications. The finding that financial deepening affects economic growth suggests the need for concerted efforts to improve the growth of financial savings. As has been noted in several studies³⁶ and this study as well, financial deepening is represented by the growth of monetary assets and the degree of financial intermediation. There are several factors that stimulate the growth of financial savings. These include price stabilization, fiscal discipline, taxation policies and removal of several restrictions on financial institutions. As observed by Jao (1976), such a removal will help to solicit savings by offering realistic interest rates.

Formal financial institutions are biased towards urban areas. In rural areas, the formal financial sector remains shallow and noncompetitive. This means that rural households largely depend on government or donor programmes, limited services offered by informal systems, or self-finance. Given the demographics of Malawi³⁷, focused initiatives that aim to build institutions that can meet the

³⁶ Jao, 1976; Fry, 1978; Demetiades and Hussein (1996), Levine (2000)

³⁷ 86% of Malawi's population lives in rural areas

demands of rural areas is a priority. Increasing the supply of financial services to many market segments including rural clients and a significantly larger segment of poor and low-income clients will require building efficient and sustainable financial institutions. It will require the emergence of a diverse range of institutional types that respond to diverse market niches.

The result that investment positively affects economic underscores the need for stakeholders to raise the volume of investment. Recognizing the important role of investment in determining economic growth, there is need for policies that will attract both foreign and domestic investment. Similarly, there is need for investments to be made in the education sector to improve the quality of human capital as this has been found to affect growth positively. As inflation has been found to negatively affect growth, at least in the short run, efforts should be put in place to reduce inflation to minimum levels.

6.3 Areas of Future Research

Undoubtedly, no single study can encompass everything. While this study has made important advances, there is need for much more research on financial deepening. Why financial structure changes as countries grow or why countries at similar stages of economic development have different looking financial systems are areas of research that future studies could explore. Much more information about the determinants and implications of financial structure will move us closer to a comprehensive view of financial deepening and economic growth.

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APPENDIX 1: AUGMENTED NEOCLASSICAL GROWTH MODEL

The effect of growth of the variables used in the study can be derived from the aggregate as follows:

$$Y = AF(K, L)$$

(1)

Where:

Y = output; A = efficient parameter; and K and L are capital and labour employed, respectively.

In terms of growth rate, we have equation 1 thus:

$$\frac{dY}{Y} = \frac{dA}{A} + \alpha_K \frac{dK}{K} + \alpha_L \frac{dL}{L}$$

(2)

Equation (2) can also be described as

$\frac{dY}{Y} = Y_K dK + Y_L dL + Y_A dA$ (i.e. growth in output due to capital, labour, and knowledge)

Or, equivalently, we have

$$\frac{dY}{Y} = (Y_K) \cdot \frac{dK}{Y} + \left\{ \frac{Y_L L}{y} \right\} \cdot \frac{dL}{L} \left(\frac{Y_A \cdot A}{Y} \right) \cdot \frac{dA}{A}$$

(3)

But $A = A(FD, FV)e^{at}$

(4)

Where:

FD = variable representing financial deepening

FV = other explanatory variables

If we assume that the level of $\frac{FD}{Y}$ and $\frac{FV}{Y}$ affects the growth rate of efficiency, then equation 4 can be appropriately written as

$$A = A_0 e \left[a + b_1 \left(\frac{FD}{Y} \right) \cdot b_2 \left(\frac{FV}{Y} \right) \right] t$$

(5)

Equation 5 can also be expressed in growth terms, thus

$$\frac{dA}{A} = a_0 + a_1 \left(\frac{FD}{Y} \right) + a_2 \left(\frac{FV}{Y} \right) \quad (5^1)$$

$$\text{But } dA = \left[A_{FD} dFD + A_{FV} dFV \right] e^{at} + A(FD, FV) a e^{at} \quad (6)$$

Equation 6 uses the rule that states that:

$$d(x.y) = y.dx + x.dy$$

Dividing equation 6 through by A , we have its equivalent in equation 7:

$$\frac{dA}{A} = \left(\frac{A_{FD} \cdot FD}{Y} \right) \cdot \frac{dFD}{FD} + \left(\frac{A_{FV} FV}{Y} \right) \cdot \frac{dFV}{FV} + a \quad (7)$$

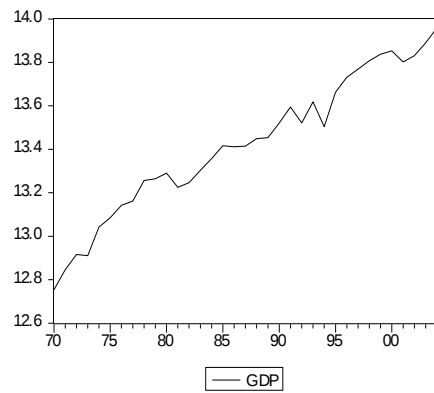
Then putting together equations 3 and 7 gives us an equation that is close to the one we intend to estimate, thus:

$$\left(\frac{dY}{Y} \right) = a_0 + a_1 \left(\frac{I}{Y} \right) + a_2 \left(\frac{dL}{L} \right) + a_3 \left(\frac{dFD}{FD} \right) + A_4 \left(\frac{dFV}{FV} \right) + U \quad (8)$$

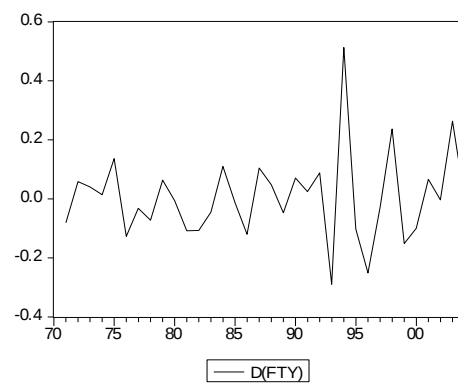
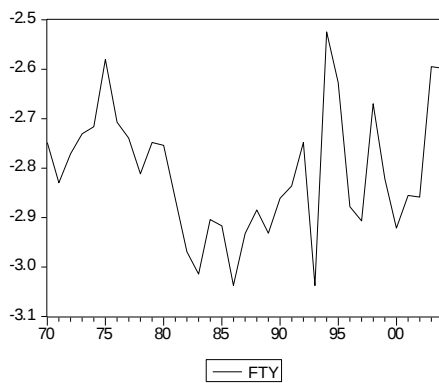
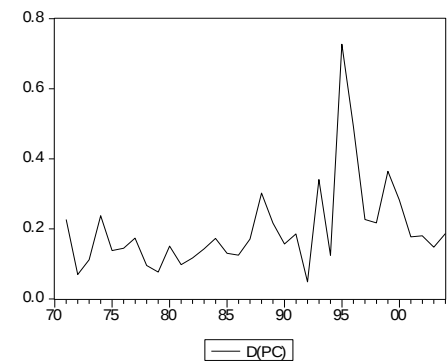
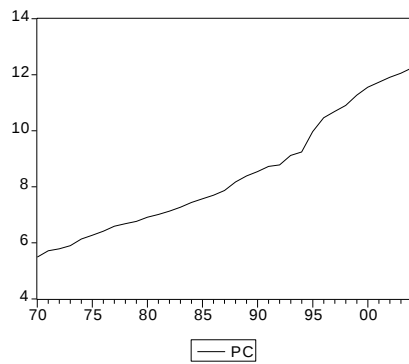
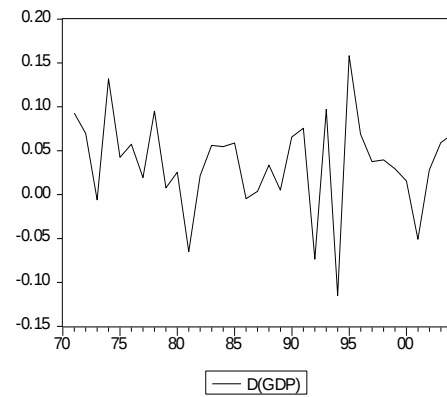
For our purposes, variables representing other explanatory variables besides financial deepening (FD) include trade openness, inflation, human capital and investment.

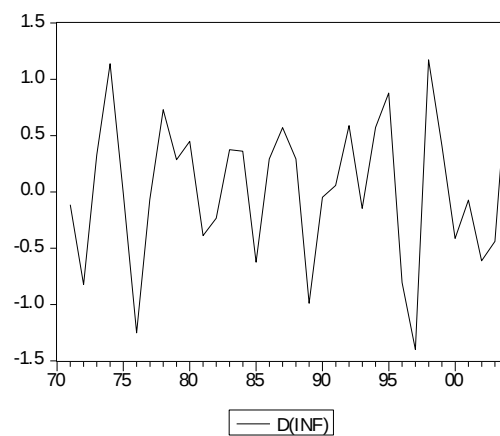
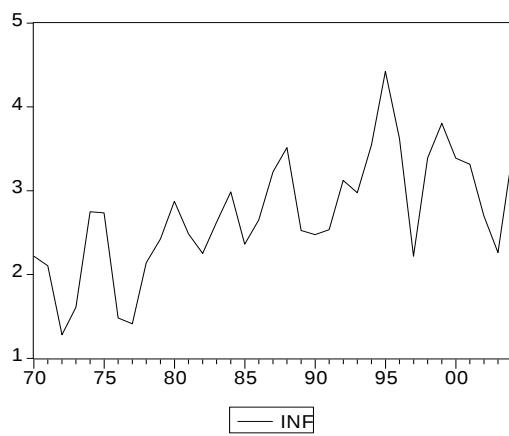
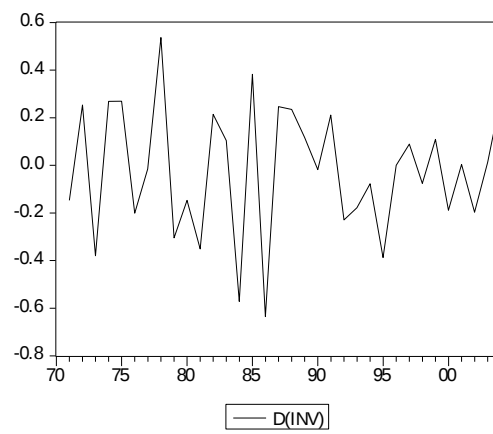
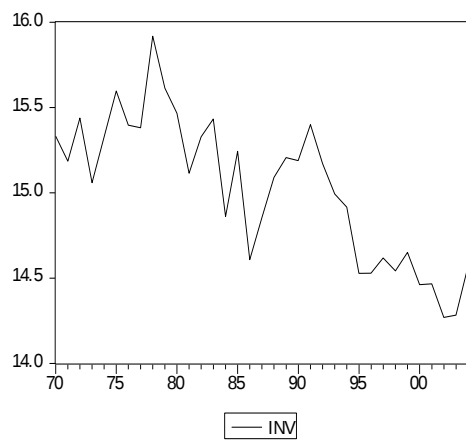
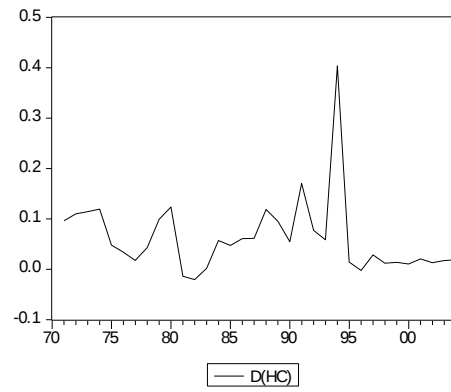
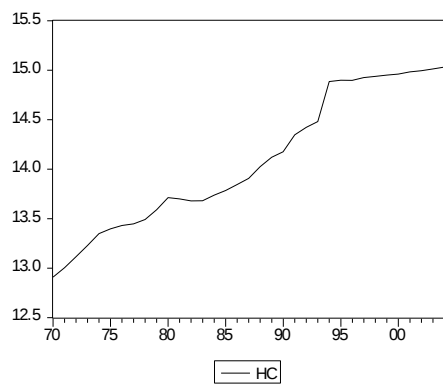
APPENDIX 2: GRAPHS OF VARIABLES IN LEVELS AND DIFFERENCED FORM

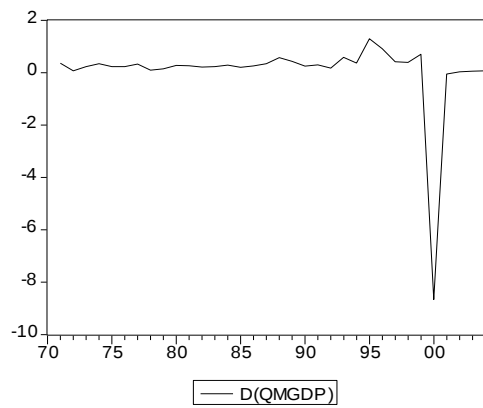
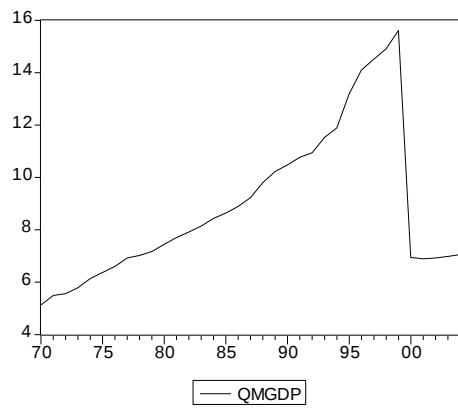
Variables in levels



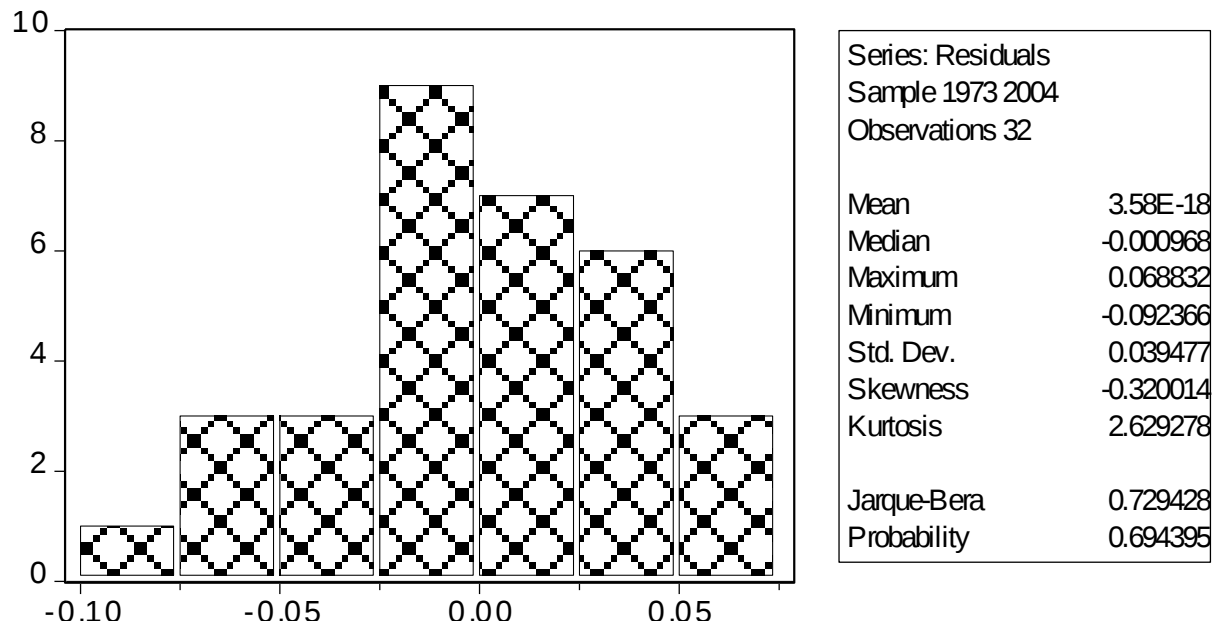
Differenced variables





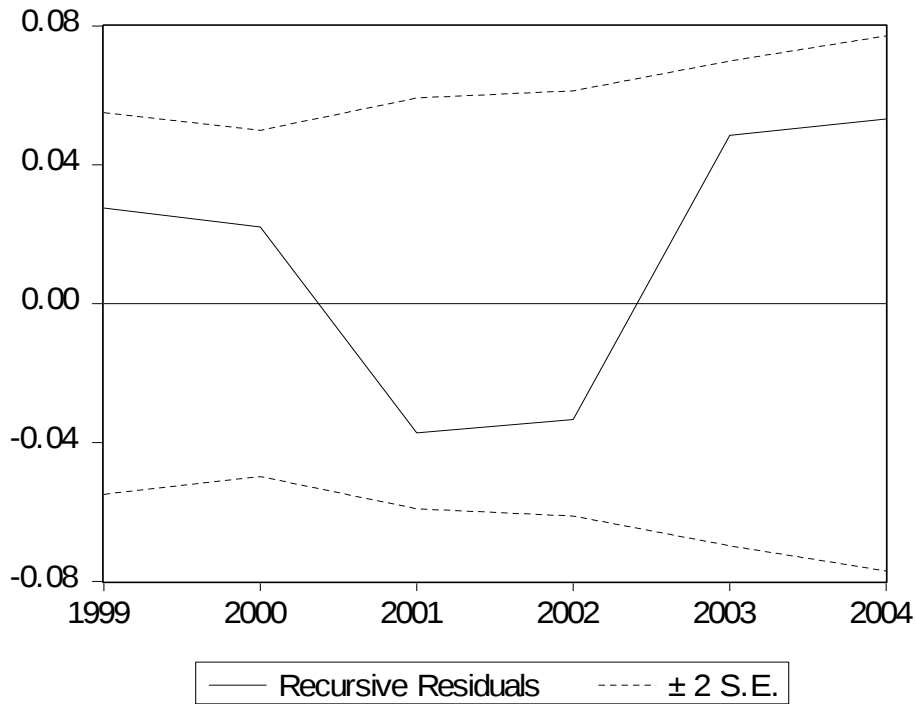


APPENDIX 3: HISTOGRAM-NORMALITY TEST RESULTS

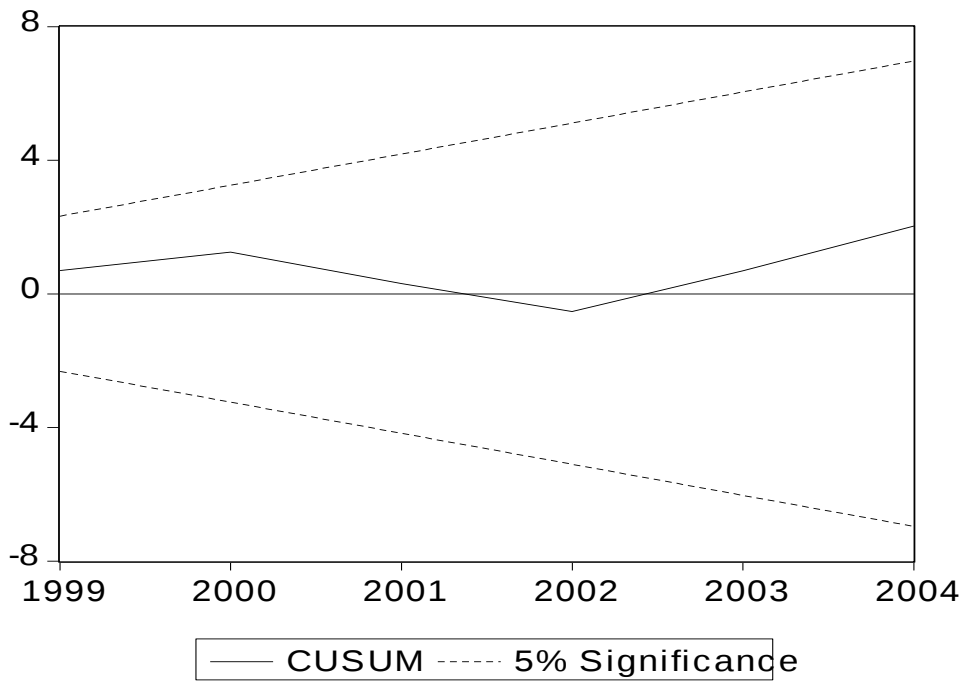


APPENDIX 4: RECURSIVE ESTIMATES

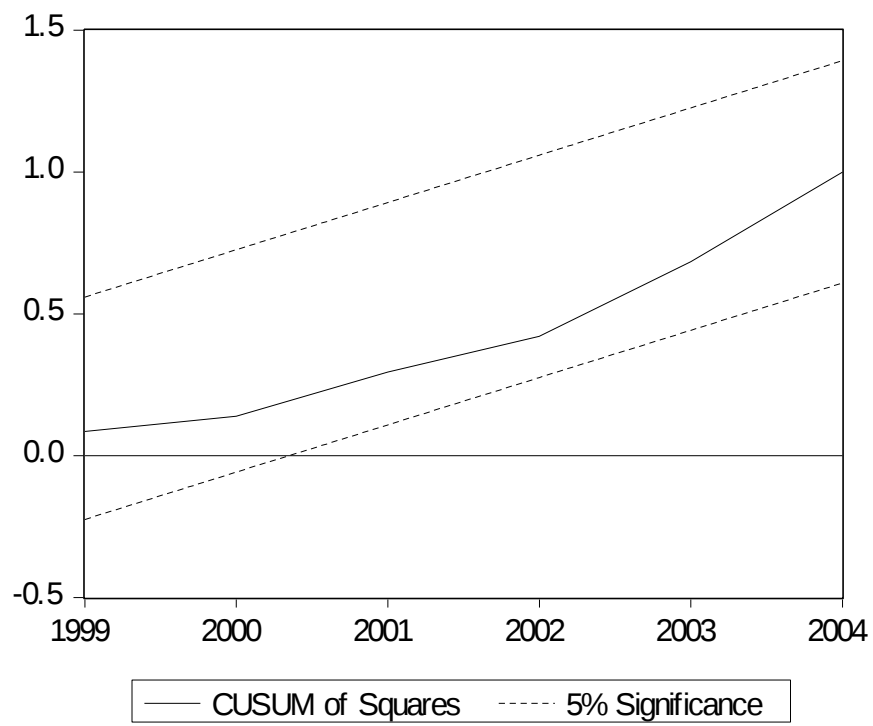
RECURSIVE RESIDUALS



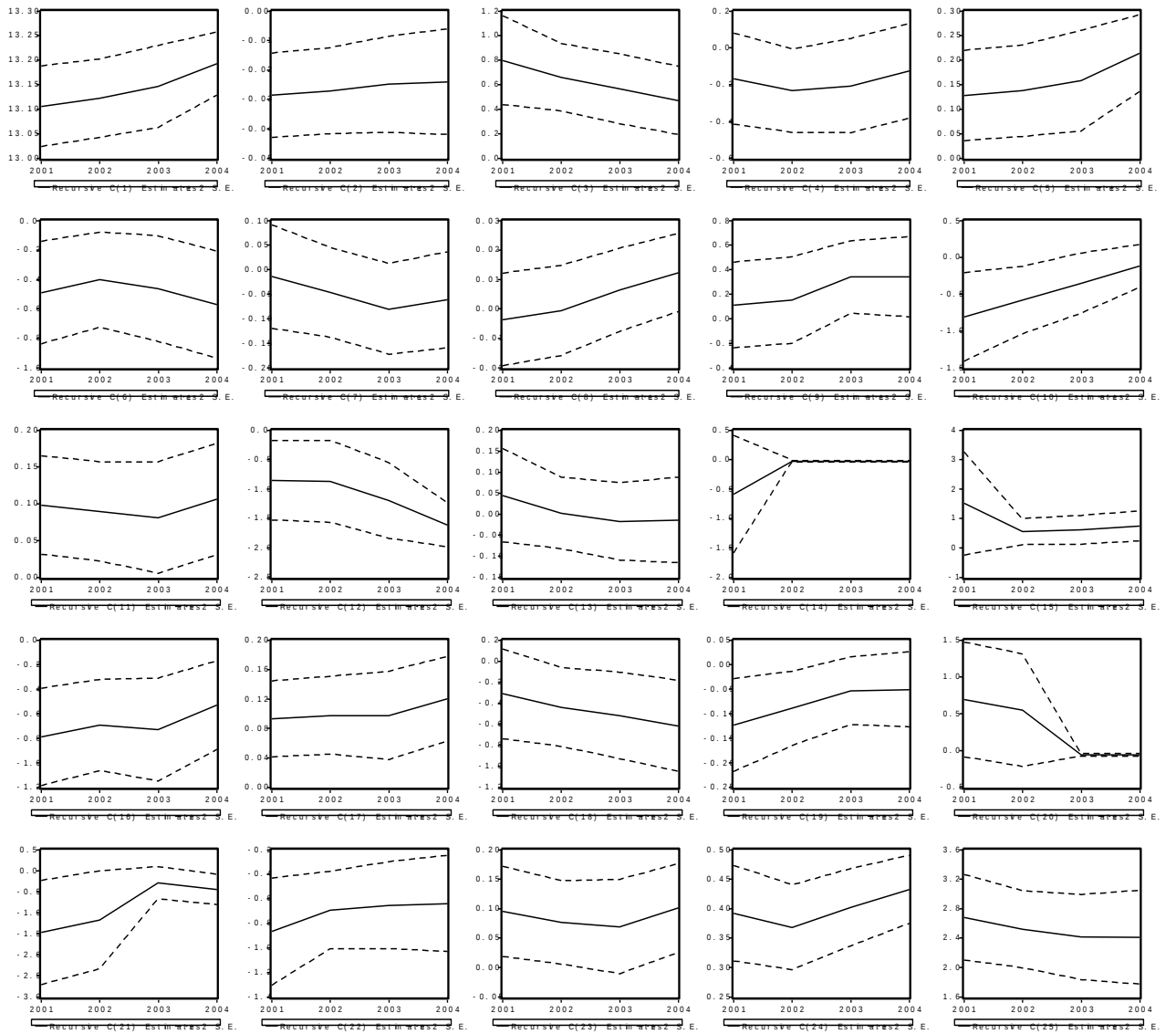
CUSUM TEST



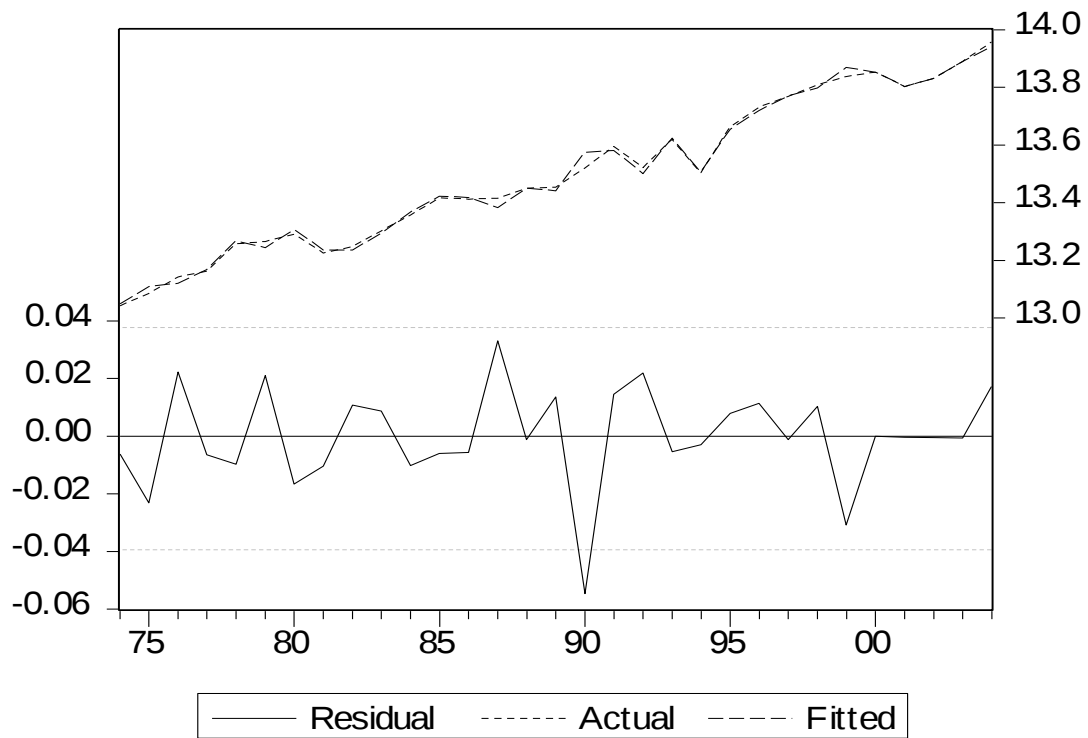
CUSUM OF SQUARES



RECURSIVE COEFFICIENTS



APPENDIX 5: ACTUAL VS FITTED VALUES



APPENDIX 6: OVER-PARAMETERIZED MODEL

Dependent Variable: D(GDP)

Method: Least Squares

Date: 07/06/07 Time: 23:03

Sample(adjusted): 1974 2004

Included observations: 31 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.17048	0.023189	567.9643	0.0000
D(QMGDP)	-0.034575	0.007851	-4.403926	0.0117
D(QMGDP(-1))	0.007066	0.004440	1.591440	0.1867
D(QMGDP(-2))	-0.034203	0.004539	-7.535905	0.0017
D(QMGDP(-3))	-0.059645	0.007583	-7.865799	0.0014
D(PC)	0.453787	0.084667	5.359649	0.0058
D(PC(-1))	0.404433	0.100253	4.034135	0.0157
D(PC(-2))	0.660042	0.175194	3.767499	0.0196
D(PC(-3))	-0.471247	0.144257	-3.266709	0.0309
D(FTY)	-0.164787	0.078552	-2.097804	0.1039
D(FTY(-1))	-0.118624	0.090572	-1.309724	0.2604
D(FTY(-2))	-0.713615	0.140167	-5.091173	0.0070
D(FTY(-3))	-0.777629	0.208526	-3.729165	0.0203
D(INF)	0.219528	0.032437	6.767895	0.0025
D(INF(-1))	0.093076	0.024987	3.725050	0.0204
D(INF(-2))	0.117905	0.019140	6.160172	0.0035
D(INF(-3))	0.100575	0.027417	3.668399	0.0214
D(HC)	-0.606431	0.122309	-4.958207	0.0077
D(HC(-1))	-1.562555	0.138301	-11.29822	0.0003
D(HC(-2))	-0.505217	0.146059	-3.458997	0.0258
D(HC(-3))	0.299537	0.208696	1.435277	0.2245
D(INV)	-0.080004	0.030738	-2.602778	0.0599
D(INV(-1))	-0.011442	0.034116	-0.335396	0.7542
D(INV(-2))	-0.076728	0.030728	-2.497010	0.0670
D(INV(-3))	-0.074803	0.023738	-3.151188	0.0345
DUM	0.434310	0.018671	23.26166	0.0000
ECT(-1)	-2.865841	0.296966	-9.650396	0.0006
R-squared	0.998959	Mean dependent var	13.49732	
Adjusted R-squared	0.992196	S.D. dependent var	0.263292	
S.E. of regression	0.023259	Akaike info criterion	-4.990018	
Sum squared resid	0.002164	Schwarz criterion	-3.741061	
Log likelihood	104.3453	F-statistic	147.7040	
Durbin-Watson stat	2.092863	Prob(F-statistic)	0.000098	

APPENDIX 7: PARSIMONIOUS ERROR CORRECTION MODEL

Dependent Variable: D(GDP)

Method: Least Squares

Date: 07/11/07 Time: 18:41

Sample(adjusted): 1974 2004

Included observations: 31 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.22266	0.025450	519.5481	0.0000
D(QMGDP(-2))	0.029653	0.006989	4.242816	0.0008
D(QMGDP(-3))	0.032685	0.006298	5.190053	0.0001
D(PC)	0.343093	0.140776	2.437147	0.0350
D(PC(-1))	0.365622	0.128609	2.842901	0.0130
D(FTY(-2))	0.397236	0.125578	3.163275	0.0069
D(FTY(-3))	0.130918	0.084280	1.553374	0.1426
D(INF)	-0.109388	0.022994	-4.757291	0.0003
D(INF(-2))	-0.098102	0.024376	-4.024609	0.0013
D(HC)	0.762355	0.134855	5.653146	0.0001
D(HC(-1))	0.705057	0.146828	4.801928	0.0006
D(HC(-2))	0.600305	0.222002	2.704056	0.0205
D(INV)	-0.106241	0.042260	-2.514022	0.0248
D(INV(-2))	-0.095750	0.041164	-2.326042	0.0355
D(INV(-3))	-0.075559	0.042377	-1.783017	0.0963
DUM	0.404054	0.024832	16.27172	0.0000
ECT(-1)	-0.614279	0.164181	-3.218324	0.0033
R-squared	0.884378	Mean dependent var	13.49732	
Adjusted R-squared	0.766525	S.D. dependent var	0.263292	
S.E. of regression	0.048172	Akaike info criterion	-2.926220	
Sum squared resid	0.032488	Schwarz criterion	-2.139840	
Log likelihood	62.35641	F-statistic	55.13685	
Durbin-Watson stat	2.059326	Prob(F-statistic)	0.000000	

APPENDIX 8: Policy Reforms and Deregulation in the Financial Sector in Malawi, 1982–2000

Year	Policy Actions
1982	-Devaluation of Malawi kwacha by 15 percent in April. -Adjustment of interest rates.
1983	-Devaluation of Malawi kwacha by 12 percent in September. -Adjustment of interest rates.
1984	-Devaluation of Malawi kwacha by 3 percent in January. -Adjustment of interest rates.
1985	-Devaluation of Malawi kwacha by 15 percent in April. -Adjustment of interest rates.
1986	-Devaluation of Malawi kwacha by 9.5 percent in January and 10 percent in August. -Adjustment of interest rates. -Entry and establishment of Leasing and Finance Company in 1986 as a lease finance company.
1987	-Devaluation of Malawi kwacha by 20 percent in February. -Liberalization of lending rates.
1988	-Devaluation of Malawi kwacha by 15 percent in January. -Deregulation of deposit rates. -Removal of credit ceilings and credit rationing.
1989	Review of the legal framework for the financial sector leading to new and revised legislation: Reserve Bank of Malawi (RBM) Act of 1989, Banking Act of 1989, leading to deregulation of entry into the banking sector.
1990	-Liquidity Reserve Requirement (LRR) was enforced at 10 percent of commercial bank liabilities effective June 1, with commercial banks earning interest on reserves. -Devaluation of Malawi kwacha by 7 percent in March. -Restructuring of Post Office Savings Bank into Malawi Savings Bank. -Incorporation of Leasing and Finance Company as a leasing finance bank on September 14. -Preferential lending to the agricultural sector was abandoned. -RBM introduced the marketing of its own bills. -LRR adjusted four times (January 2: 25 percent, May 15: 15 percent, June 1: 10 percent, September 1: 20 percent). -LRR ceased to earn interest with effect from December 1. -Incorporation of National Finance Company as a lease finance bank on April 17.
1991	-Entry and incorporation of CBM Financial Services, a subsidiary of Commercial Bank of Malawi, as a lease finance company on June 28. -Incorporation of the Finance Corporation of Malawi as a corporate bank (trade financing) on August 1. -Incorporation of Indebank Financial Services Limited as a corporate bank (trade financing) on September 6. -LRR decreased to 15 percent with effect from August 1. -Complete liberalization of foreign exchange allocation.
1992	-Devaluation of Malawi kwacha by 15 percent in June and 22 percent in July. -LRR increased to 20 percent with effect from December 23. Penalty for noncompliance with LRR was introduced at 18 percent.

1993	-LRR increased to 30 percent with effect from October 29.
1994	-Flotation of Malawi kwacha in the foreign exchange in February. -Entry and incorporation of the First Merchant Bank as a commercial bank on July 5. -LRR increased to 35 percent with effect from December.
1995	-Penalty for noncompliance with LRR was increased to 45 percent at the beginning of the year to 55 percent in April to 60 percent in June. - Entry and incorporation of Finance Bank as a commercial bank on March 29. -Incorporation of Malawi Savings Bank as a merchant bank on March 29.
1996	-Bank rate reduced from 45 percent on June 12, to 35 percent on September 9, to 27 percent from November 13 and the LRR dropped from 55 percent to 47 percent.
1997	-Bank rate was reduced from 27 percent to 23 percent on August 1. -Penalty for noncompliance with LRR was reduced to 43 percent and calculation of LRR was changed from daily to monthly average and RBM started paying interest rate on reserves.
1998	Entry and incorporation of Continental Discount House in March and the introduction of interbank market lending among banks. -Introduction of daily basis LRR observance by commercial banks with effect from August 1 and RBM ceased paying interest rate on reserves. -Commercial banks discretion to put reserves with either RBM or Discount House or in their vaults was introduced. -Bank rate was decreased from 32.5 percent to 30 percent with effect from September 14. -Incorporation of Loita Investment Bank as a merchant bank on November 28. - Sharp depreciation of Malawi kwacha.
1999	-Bank rate increased from 43 percent to 47 percent on January 11.
2000	-The LRR was lowered to 30 percent in June and the penalty on shortfalls on the LRR account was set at ¼ percent per day. -RBM reintroduced own bills and bank rate decreased to 44.5 percent in August and increased to 53.2 percent in December.

Source: Chirwa and Mlachila (2004)

APPENDIX 9: DATA USED IN THE STUDY

YEAR	GDP	REAL GDP	QMGDP	PC	HC	INF	FTY	INV
1970	242.10	169.47	0.0597687	90.393162	403682	9.2	0.640231	18.5892
1971	303.60	242.88	0.059025	88.399597	444384	8.2	0.59025	19.0357
1972	325.50	260.4	0.0686022	75.338409	496018	3.6	0.625806	17.7016
1973	364.00	327.6	0.0816209	69.682875	556115	5	0.651648	16.7127
1974	461.50	461.5	0.0920043	71.61066	626634	15.6	0.661105	18.5914
1975	529.70	582.67	0.0919955	45.498053	657404	15.4	0.757787	17.1229
1976	612.00	734.4	0.0788235	46.540613	679892	4.4	0.667157	13.6438
1977	728.00	1019.2	0.0837088	51.459555	691971	4.1	0.646154	12.8022
1978	800.70	1120.98	0.0933808	55.715912	722419	8.5	0.601099	18.6087
1979	864.50	1296.75	0.0919607	57.460179	797784	11.3	0.64037	19.2944
1980	1,005.10	1708.67	0.0938514	55.262921	902632	17.7	0.636554	17.4510
1981	1,108.10	2216.2	0.1143038	44.631731	890007	12	0.571248	10.2157
1982	1,245.60	2740.32	0.1168674	43.289539	871904	9.5	0.513407	8.4377
1983	1,437.00	3448.8	0.1148365	42.974035	873461	13.8	0.490814	8.3368
1984	1,707.40	4609.98	0.1370739	37.740206	924653	19.8	0.547968	9.7634
1985	1,944.90	5640.21	0.1118309	31.034483	969431	10.6	0.540902	8.2781
1986	2,202.90	7269.57	0.1216714	29.107906	1030105	14.2	0.479595	9.1697
1987	2,613.10	10191.09	0.1417627	24.2197	1095232	25.1	0.532624	7.7609
1988	3,534.40	18025.44	0.1065443	36.819579	1233233	33.6	0.558652	7.8882
1989	4,388.20	27645.66	0.0931999	45.001938	1356476	12.5	0.532975	7.3082
1990	5,132.44	35413.836	0.0925486	59.211052	1433066	11.9	0.572028	7.6962
1991	6,177.20	47564.44	0.0917455	62.635171	1699264	12.6	0.58635	8.3209
1992	6,484.20	56412.54	0.0977006	50.83935	1835348	22.7	0.640495	10.2449
1993	9,116.60	101194.26	0.1014029	39.295581	1945551	19.6	0.479521	8.3770
1994	10,324.70	145578.27	0.1084274	44.471034	2912780	34.7	0.801089	15.1443
1995	21,358.30	531821.67	0.0906641	47.80469	2954751	83.4	0.722876	9.6528
1996	34,919.20	1326929.6	0.0872909	45.994591	2947829	37.3	0.562424	6.5281
1997	43,794.80	2010181.3	0.0619348	46.480547	3032714	9.2	0.546499	6.7325
1998	54,395.40	2980867.9	0.0820525	72.890875	3069452	29.7	0.692627	8.7554
1999	78,297.00	5997550.2	0.0679878	73.905955	3111804	44.8	0.595208	10.2503
2000	103,815.00	1,038.15	0.0845687	72.456097	3143928	29.6	0.538535	10.0190
2001	123,927.00	986.67994	0.0957072	48.984858	3209371	27.5	0.575314	10.3277
2002	148,356.00	1014.7469	0.0951367	30.998337	3251772	14.9	0.573452	7.6784
2003	171,918.00	1076.5059	0.1049826	34.07822	3308654	9.6	0.746414	9.3180
2004	207,209.00	1153.0829	0.0920452	24.523507	3372109	29.8	0.744089	12.5705

YEAR	EXPORTS	IMPORTS	DUM
1970	60.5	94.5	0
1971	72.7	106.5	0
1972	79.4	124.3	0
1973	100.6	136.6	0
1974	126.2	178.9	0
1975	155.4	246	0
1976	185.6	222.7	0
1977	218.4	252	0
1978	168.9	312.4	0
1979	200.5	353.1	0
1980	249.7	390.1	0
1981	284.4	348.6	0
1982	280.2	359.3	0
1983	298.2	407.1	0
1984	484.4	451.2	0
1985	470.5	581.5	0
1986	504.7	551.8	0
1987	665.1	726.7	0
1988	824.3	1150.2	0
1989	824.1	1514.7	1
1990	1220.6	1715.3	1
1991	1437.2	2184.8	1
1992	1504.3	2648.8	1
1993	1470.7	2900.9	1
1994	3059.5	5211.5	1
1995	7047.6	8391.8	1
1996	7743.8	11895.6	1
1997	9619.3	14314.5	1
1998	15468	22207.7	1
1999	19907	26696	1
2000	23625	32283	1
2001	31817	39480	1
2002	31417	53658	1
2003	51672	76650	1
2004	101554	101554	1

