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Financial liberalization, financial development and economic growth: The case for South Africa

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DECLARATION

Except for references specifically indicated in the text, and such help as has been acknowledged, this thesis is wholly my own work and has not been submitted to any other University or Higher Education Institution.

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TATENDA SAVANHU

ABSTRACT

Financial liberalization in South Africa was a process that took the form of various legal reforms over a long period of time. This study uses quarterly financial data from 1969 quarter one to 2009 quarter four to analyse this process. The data used was pertinent to the financial liberalization theorem by McKinnon (1973) and Shaw (1973). The examination of the relationships between the various macro economic variables has important implications for effective policy formulation.

The empirical analysis is carried out in four phases: the preliminary analysis, the principal component analysis (PCA), the cointegration analysis and pair wise Granger causality tests. The preliminary analysis examines trends over the sample period and reports the on the correlation between the selected variables. The PCA analysis was used to create indexes for financial liberalization, taking into account the phase wise nature of legal reforms. The generated index was representative of the process of financial liberalization from 1969 to 2009. A financial development index was also created using the various traditional measures of financial development and through PCA which investigated interrelationships among the variables according to their common sources of movement. Cointegration analysis is carried out using the Johansen cointegration procedure which investigates whether there is long-run comovement between South African economic growth and the selected macroeconomic variables. Where cointegration is found, Vector Error-Correction Models (VECMs) are estimated in order to examine the short-run adjustments. For robustness, many control variables were added into the model.

The results showed that there are positive long run relationships between economic growth and financial liberalization, financial development and a negative relationship with interest rates. The Granger results suggested that the MS hypothesis does not manifest accurately in the South African data. The implications of the results were that financial liberalization has had positive effects on economic growth and thus any impediments to full financial liberalization must be removed albeit with considerations towards employment and local productivity. Financial development also possessed positive long run relationships with economic growth, although results differed based on the financial development proxy used. Thus, financial development must be improved primarily through liberalizing the banking sector and spurring savings.

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CHAPTER 1: INTRODUCTION

1.1 CONTEXT OF THE RESEARCH

The world over, there has been a general move to more liberal economic policies. Such moves have been motivated by, among others, political ideologies and socio-economic choices. As economies move from relative autarky to openness, domestic legislative controls become insufficient to insulate the economy from exogenous shocks. It therefore becomes imperative to relax some of the domestic controls so that the domestic macroeconomic variables automatically adjust to smoothen out the effects of exogenous shocks. Against this background, the De Kock Commission advised South Africa (SA) to adopt more market-oriented policies in order to contain inflation and to maintain international competitiveness (Casterleign, 2001). This was after the country had experienced an upward spiral of inflation between 1970 and 1975, which caused SA to lose international competitiveness.

For a long time, developing countries were the subject of much debate surrounding the most efficient steps that they could take to economic prosperity. Many vigorous debates on the subject ensued; however, a main argument surfaced namely the Washington consensus. This consensus was a set of ten policy prescriptions meant for crisis ridden developing nations, where the fourth point was interest rate liberalization. Three key themes emerged from the consensus *viz*; macroeconomic discipline, a market economy, and openness to the world (Williamson, 2002). On formulating a market economy, various reforms were important in this regard. But it is important to note that, liberalization of interest rates was a key policy prescription. In hindsight, the author admitted he should have termed interest rate liberalization, 'financial liberalization' as it encompassed other areas of the financial sector and the time period of implementation varied. The positive effects of financial liberalization are almost a stylized fact in economics literature. However, Chaudry (2006) notes the difficulty of measuring financial liberalization. The task is simplified with the suggestion that financial liberalization of the financial sector leads to financial development and then to economic growth (McKinnon, 1973; Shaw, 1973 and Chaudry, 2006). Serieux (2008) described internal financial liberalization as; market-determined interest rates, increased ease of entry into the banking sector to promote competition, the eradication of directed credit programmes, reduced fiscal dependence of the state on credit from the banking system (to allow for expansion of credit to the private sector), the integration of formal and informal markets and a movement towards equilibrium exchange rates and, eventually, flexible

exchange rate regimes with open capital accounts. It is noteworthy that the latter is an expression of liberalization regarding external finance, while this study exclusively focuses on the earlier which is termed domestic/internal financial liberalization.

Financial sectors of developing countries were known to be characterized by unsound financial institutions with deficient prudential regulations and supervision, statutory interest rate ceilings, where interest rate levels were put in place governmentally; uncompetitive and segmented financial markets with a small number of large commercial banks dominating the sector. Furthermore, the existence of informal financing; and segmented financial institutions in terms of activities and economic sectors, sources of funding for institutions and prescribed type of assets to hold. In these systems, the central bank typically has limited control on the sector and generally exists for the of servicing government debts, conducting foreign exchange transactions on behalf of government and ensuring that institutions do not enter into liquidity problems. Due to these factors then, developing countries' financial systems were said to be financially repressed (Kabubo and Ngugi, 1998).

The term financial repression was created by McKinnon and Shaw (1973), in which the above situation represented extreme financial repression. The McKinnon and Shaw (1973) framework referred to herein as MS, proposes that repressed financial system hinders economic development as the intermediaries are not adequately developed for mobilization of savings. While the allocation of financial resources among competing uses is inefficient. The MS framework proffers policy prescription to effectively deal with the adverse effects of financial repression. This prescription hinges mainly on interest rate liberalization i.e. market determined interest rates. It is believed that due to financial repression, interest rates would be at sub optimal levels thus causing the need for credit rationing (Serieux, 2008). The removal of interest rate controls is predicted to increase the interest rate which makes saving attractive, consequently domestic savings increase. Since there is now more savings, the domestic intermediaries are able to offer loans competitively, thus investment increases and with this ultimately economic growth (McKinnon, 1973). However, financial liberalisation includes more than interest rate liberalization (Serieux, 2008; Williamson, 2002). The lynchpin of which, is market determined interest rates that effectively and accurately price financial assets and reveal their risk, maturity as well as costs. The other elements of financial liberalization include fostering competition among participants in the financial sector, improving prudential regulations and supervision, reducing market fragmentation and adoption of indirect instruments of monetary control.

Fry (1997) fully supports financial liberalisation as envisaged in the MS hypothesis and further asserts that the economy will ultimately grow through the saving and investment nexus that is supported by a financial liberalization framework. Financial liberalisation is particularly important in developing countries whose financial sectors are dominated by a few large banks thus little competition exists. Moreover, the financial environment in LDC`s (Less developed countries) is repressed by numerous constraints which would lead to sub-optimal results in the financial sector and greater economy. As such it is important to examine the link between savings, investments and interest rates for developing countries. Bandiera *et al* (2000) empirically validate the claim that there is a positive relationship between higher interest rates and increased saving rates and established that there is a relationship between financial liberalisation and economic growth. The time period under study is 1970-1994 and the study concerns developing nations.

However, according to Arestis (2004), financial liberalization has not immensely benefitted the developing countries. In some instances it has actually harmed the economy. This view is reinforced by Stiglitz (1998:33) where he proposes that vast regulations such as restrictions on interest rates or lending to certain sectors such as speculative real estate may improve the strength of the financial system and amplify the efficiency of the economy. Furthermore the empirical evidence has not been able to resolve theoretical controversy regarding the benefit of financial liberalization. Many authors (Arestis and Demetriades, 1997) and Bisat *et al*, 1992) show the effects to be heterogeneous across countries at different stages of institutional and economic development. This study aims to add to the body knowledge by investigating whether the tenets of the MS framework of financial liberalization are manifest in the South African economy with regard to savings, investment, interest rates and economic growth.

There is widespread debate on whether the Washington consensus was a success or a failure. However, this study aims to examine point four of the ten point plan which is financial liberalization. The answer to this question will vary depending on the extent that the country implemented market oriented policies, the sequencing of this reform and the commitment to reform. South Africa embarked on financial reforms as advocated by the De Kock Commission much earlier than the IMF sponsored structural adjustment programmes undertaken in much of the developing world. To this end, it is important to carefully note the progress of financial liberalisation as a contribution to economic growth in South Africa and whether the theoretical tenets of the MS are manifest in the South African economy.

Since the seminal work by McKinnon and Shaw (1973) is a key contribution to the literature on financial liberalisation, a key motivation is to examine the extent to which the theoretical tenets of the MS are manifest in the South African economy; as such information will be important for policy makers, firms and potential investors. This is because accurate empirical validations will enable beneficial policies to be implemented regarding the financial sector. While firms and potential investors will find such a study beneficial as it will outline the potential for entering the financial sector or the imminent possibility of government allowing more entrance into the financial sector.

Many studies that delve into research regarding financial liberalisation have been very broad as they inculcate external liberalization of finance into their definition of financial liberalisation. In light of this such research includes the effects of trade flows and exchange rates (Levine, 2001; Loots, 2002 and Ang and McKibbin, 2007). However, this study aims to fill that gap by specifically focusing on South Africa and the internal financial liberalisation aspect. Secondly, many other studies that focus on financial liberalisation use panel data and study many countries simultaneously (Bandiera *et al*, 2000; Reinhart and Tokatlidis, 2001; Bonfiglioli, 2005). Therefore their results reflect an average and are not country specific and as a result such evidence is only a reference point for policy makers. Thirdly, South Africa has a rich history of financial reforms that warrants such a study, notwithstanding, South Africa also has a relatively good and accurate database by developing country standards thereby allowing accurate, robust empirical analysis.

1.2 GOALS OF THE RESEARCH

The objectives of the study are as follows;

- To create appropriate indexes for Financial Liberalization and Financial Development in Africa
- To assess the impact of domestic financial liberalization and financial development on economic growth and whether there is a long run relationship between these variables.
- To examine whether this relationship still exists after control variables such as inflation, trade openness and government debt are included in the model.
- To analyse the relationship between various economic variables in order to ascertain if the South African data asserts the MS link of higher interest rates being commensurate

with higher savings and investments, and whether a stable long run relationship exists between these variables.

- To articulate the policy implications of the findings.

1.3 RESEARCH DESIGN AND METHODOLOGY

Theoretical and empirical literature on the real sector, finance sector and MS hypothesis is surveyed with a view to buttress understanding of the empirical results to be obtained. The second step includes the compilation of selected data pertinent to the study. Yearly data, stretching from 1969 to 2009 are used to enable long run empirical analysis. Also, this time period encompasses the pre-reform era which signifies financial repression, and includes post reform era that is indicative of financial liberalisation. Prior to applying formal econometric methodology, it is important to ascertain the behaviour of the data through the use of descriptive statistical tests and simple correlation. Some of the statistical tests include the mean, variance, standard deviation, skewness, kurtosis and normality of the data.

The study sets out to examine the degree to which theoretical underpinnings of the MS framework manifest in the South African economy and further to examine the contribution of financial liberalization to economic growth. The empirical undertaking to validate this MS assertion will include cointegration analysis using the Johansen (1988) and Johansen and Juselius (1990) cointegration approach. Cointegration allows analysis into the existence of a long run stable relationship between various pertinent variables i.e. financial development proxies, financial liberalization proxies, interest rate, savings, growth and investment. However, preceding that principal component analysis is used to obtain an index for financial liberalisation as in Chowdhury and Shrestha (2006), Fowewe (2005), Loots (2002). Since financial liberalisation is a gradual process, there are various legislative processes that warrant financial liberalisation that may occur at different times (Fowewe, 2005). Thus through principal component analysis, it is possible to identify a single most important component factor that can serve as a proxy for financial liberalisation and financial development (Ang and Mckibbin, 2007). Therefore to generate the financial liberalisation index, the study follows Fowewe (2005) and uses a combination of variables from Fowewe (2005) and Loots (2002) that are relevant to internal financial liberalization. Similarly, since financial development is posited to have a relationship

with economic growth, the study explores this notion through an amalgamated financial development measure.

1.4 ORGANIZATION OF THE STUDY

This thesis consists of six chapters. The first chapter presents the context of the study. The remainder of the study is organised as follows. Chapter two proffers a review of the theoretical and empirical literature regarding financial liberalization, financial development and economic growth. The interaction of the financial and real sectors and it also gives an overview of financial liberalization beginning from the premises and rationale of financial repression. Moreover, an analysis of the McKinnon and Shaw hypothesis is presented. Chapter 3 gives a snapshot of the South African economy and trends of relevant economic indicators. An analysis of the banking sector and summary of the reforms undertaken in South Africa is also presented. The fourth chapter deals with the empirics of the study where the processes and model specification is presented. Chapter 5 proceeds to present and analyse the findings of all the tests and chapter 6 concludes the thesis.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This section reviews various theoretical issues underlying the debates on financial liberalization, financial repression, the finance sector and economic growth, as well as the channels in which the objectives of monetary policy are achieved. It draws from literature on the linkages between money and the real sector, financial intermediation and the conduct of monetary policy. Theoretical predictions provided in the analysis of financial liberalization literature serves as a backdrop for evaluation of the occurrences in South Africa. The review will aid in answering the questions posed in the first chapter.

2.2 THE REAL ECONOMY AND THE FINANCIAL SECTOR

Much debate has been generated by the relationship between the functioning of financial systems and economic growth. Economic growth has become a more pertinent issue, in light of the global recession. Also in the past, studies of economic growth increased interest on the subject and sparked further analysis of the endogenous growth model which highlighted the possible positive role that finance has in spurring economic growth (Levine and Zervos, 1998). Many researchers have, through studies on various countries put forward the view that improved financial intermediation is a prerequisite for financial growth (Khan and Senhadji, 2000). Other researchers are more sceptical about the importance of finance in economic growth. Lucas (1998) puts forward that, "the role of finance is severely overstressed" and Robinson (1952) argued that the finance sector only grows after the economy has reached a certain level of maturity. King and Levine (1993) have a much dimmer view of finance in suggesting that financial development may lead to lower economic growth, arising from the fact that greater returns from resource allocation would lead to lower savings rates. And on the other end of the spectrum, Stiglitz and Weiss (1981) are out rightly opposed to financial liberalization given imperfections in the market and adverse selection which may produce sub-optimal results.

In order to be able to analyze the effects of financial liberalization fully, it is of paramount importance to explore the vast literature that exists on the subject of financial intermediation and banking. The literature covers a broad area of literature from the *raison d'être* for banks to microeconomic models of banking behaviour. Franke (2009:4) focuses on bank intermediation

and proposes that intermediation is a banks most basic reason for existence. Banks are different to other organizations, in that they engage in maturity transformation i.e. they take in funds on a short term basis and offer investors long term loans, thereby creating a liquidity mismatch. Swank (1996) points out that in carrying out their functions, banks are susceptible to failure from other banks through the interbank market. And Siglitz (1994) adds that financial markets are weighed down by market failure in terms of intertemporal trade, information and risk.

Financial literature is riddled with differing views on the transmission mechanism on the one hand and the relationship between the financial sector and the real economy. Financial liberalization is argued to affect the economy positively through three main channels.

- The real rate of interest, proxy for the cost of capital
- The efficiency of the financial sector and
- The volume of financial intermediation.

This view places a great importance on the role played by domestic savings in economic growth. In classical economics savings is directly linked to investments, thus an increase in domestic savings would cause a rise in economic activity arising from more investments. As such Odiambo (2006) stresses that financial liberalization may not actually cause an increase in savings due to increased rates of interest. However, it does affect the form in which savings take place through financial deepening.

2.3 MONEY TRANSMISSION MECHANISM

The monetary transmission mechanism expresses how policy induced changes in the money stock or the short term interest rate may impact the real variables such as employment and output (Ireland, 2005). Thus monetary policy largely works through its huge influence on aggregate demand in the economy (Bank of England, 2010). This view is also supported theoretically by the IS/LM framework were policy outcomes are only important insofar as they affect the aggregate outcomes (Ceccheti, 1995:2). Using the IS/LM framework, increasing the supply of money in the economy has the effect of lowering interest rates. Consequently, this would lead to an increase investment and economic activity via the multiplier effect (Ceccheti,

1995). The final impacts of these changes on the economy are dependent on the interest rate elasticity of money demand.

Hume framework insists that changes in money may be transmitted into the economy either via direct or indirect means (Wicksell, 1906). This framework is mindful of the role that money from abroad would play in economic activity. Thus the importance of the Humean framework in as far as the study relates to financial liberalisation. An increase in trade would cause an increase in prices until prices and economic activity return to the initial level. This is the operation of the indirect system. Wiksell (1906), set equilibrium conditions in the market for money:

RN=RM,

Where *RM*- is the market interest rate, and *RN*-normal rate of interest. In this framework they are forecasted to be the same, if not, adjustments will occur to bring about equilibrium. If RN>RM, then economic agents would increase their borrowings to benefit from arbitrage. Thus, economic activity rises, together with aggregate expenditure and prices. Consequently the banks must increase interest rates in order to ration their financial reserves and vice versa (Wicksell, 1906). This framework gives credence to a perfectly unhindered monetary policy that sets interest rates according to market forces, cognisant of the inflow of funds from abroad as espoused by Hume. As a monetary policy mechanism, it seems to support financial liberalization and the opening of the capital account. However, in Keynesian analysis in which the liquidity trap creates a base for the interest rate. Keynes proposes that the lack of investment is due to the attractiveness of holding money as an asset (Johnson, 1972). This is in sharp contrast to the Humean framework, as in the Keynesian framework wage rigidities cause changes in money to affect real variables.

Neo-Keynesians on the other hand begin their argument by differing with IS/LM curve on the issue of interest rates. IS/LM framework is narrow in its definition of interest rates, only as interest rates on bonds (Johnson, 1972). While Neo-Keynesians take the cost of capital as the appropriate interest rate. As such, monetary authorities try to manipulate the supply price of capital viz interest rates. To add to its modernity, the Neo Keynesians advocate for the use of Open market operations for monetary expansion and or contraction.

The extrication of the differing views on monetary transmission has brought to light a number of facts. Firstly, that there is harmony with regard to the nature of the transmission mechanism in developed countries (Aslanidi, 2007, Loayza and Schimdt-Hebbel, 2002, Montiel, 1990).

Secondly, the same conclusion does not apply to developing countries. A number of impediments deter the efficient functioning of certain channels. These impediments are according to Aslanidi, (2007); lack of adequate and organized security markets, presence of parallel financial markets, interest rate controls, credit rationing and other forms of repression on the financial markets. The inevitable outcome of the above mentioned impediments is that monetary policy actions are far less predictable in developing rather than developed economies. Thus an understanding of the channels which the monetary policy transmission mechanism works is integral in measuring the thrust of monetary policy.

Mishkin (1996) asserts that monetary policy is at the centre stage of how to promote sustainable growth and maintain low inflation in the economy. Since fiscal policy has lost its luster as the most effective tool in stabilizing the economy. This is due to doubts about the timing of fiscal actions to obtain desirable aggregate outcomes and the issue of budget deficits. Mishkin (1996) summarises the channels into the traditional interest rate channels, other asset price channels and credit channels.

2.4 FINANCIAL REPRESSION

In seminal yet independent studies McKinnon (1973) and Shaw (1973) coined the term financial repression, describing it as a situation where governments set various legal restrictions and other non market restrictions that retard efficient financial functioning and economic growth (Gupta,2004). The result is an artificially low cost of funding, i.e. non market interest rates. Consequently the interest rates do not serve an equilibrating function between the saving and investment decision. From a broader perspective as envisioned by Giovannini and de Melo (1993), financial repression also encompasses restrictions on international capital flows as well as the fiscal dimension that ties financial repression with inflation tax and seignorage. From a more policy oriented view Serieux (2008) notes that financial repression is a consequence of misguided fiscal and monetary policies, the over regulation of the financial sector, other repressive public sector intervention and excessive borrowing from the local financial system, thus potentially 'crowding out' investors. From a review of existing literature on the subject, it is interesting to note that financial repression is mainly prevalent in developing countries (Arestis, 2004; Brock, 1989; Ang and McKibbin, 2006; Giovannini and de Melo, 1993 and Serieux, 2008). The

governments must perceive a strong case for financial repression in parts or as a whole. The following section will explore the rationale employed in the choice of financial repression.

2.4.1 Rationale of financial repression

The main reason why governments resort to financial repression is to control fiscal resources (Giovannini and de Melo, 1993). Governments of many developing countries often suffer from the financial muscle to satisfy their inter temporal budget constraints with tax revenue. As such the finance sector is viewed as a cheap source of financing government deficits (Fry, 1995). Brock (1989) proffer other frequently sighted reasons for financial repression. These are; restraining the level of domestic debt, the gain from seignorage, more control of money supply through direct instruments of monetary policy, supplying credit to chosen sectors and keeping the cost of credit in the economy low.

The gain from financial repression maybe quite significant in terms of the gains made from seignorage and inflation tax. Especially in cases where the inflation is high and monetary authorities use direct measures for monetary policy (Giovannini and Melo, 1993). In effect governments are extracting the seignorage from the local financial institutions. The government may achieve their goals by actually enacting laws that dampen the growth of private bond and equity markets, as these may not be easily exploited for seignorage.

Financial markets in developing countries are usually relatively small and under developed. Furthermore, they typically have oligopolistic or monopolistic structures. Such non-competitive structures may disturb the proper functioning of interest rates as guides for decisions on savings and investments (Dornbusch and Giovannini, 1990). As such, interest rates may be kept at levels lower than market equilibrium, under the guise that these low interest rates may avail funds to public sectors that will result in wide reaching gains. Furthermore the incumbent banks would collude so as to gain from their structure and interrupt policies on liberalization that would bring financial deepening and competition thereby compromising their profits.

The channeling of credit to certain chosen sectors at subsidized interest rates is referred to as credit rationing (Ghosh *et al*, 1999). Besides holding the interest rates at sub-market levels, the government is also driven to maintain a segmented financial system. The rationale is that the success of credit rationing hinges on segmenting and restricting the proper functioning of financial markets. In adding to repressive legal statutes the government may also resort to more

direct forms of repression i.e. large reserve requirements for banks, compulsory holdings of government stock and foreign exchange controls (Serieux, 2008).

Traditionally there was also support for financial repression given that through legislations and restrictions on the financial market credit creation ability, it was possible to exert control over the supply of money. Thus, enabling the monetary authorities to use direct instruments of monetary control in order to manage inflation therefore positively influencing economic growth (Vittas, 1992).

2.4.2 Types of financial repression

The types of financial repression emanate from the different forms that financial regulation may take. Any financial control that is over-exerted or that produces results that adversely affect the economy may be considered repressive. In concordance with this notion, Vittas (1992), puts forward six types of financial sector controls that may produce distortions and a tax on activities of financial intermediation. These include allocative, organizational, macroeconomic, protective, prudential and structural controls. It is noteworthy that the controls are not mutually exclusive as a particular control measure employed may serve the function of one or more of the controls.

In order to maximize profits, banks tend to provide credit to projects which have low risks or high risk projects with short payback periods. As opposed to financing projects that have high risk and long payback periods even if such projects may positively affect the economy. As such a government may initiate allocative controls such as compulsory reserve requirements, preferential taxes and credit rationing. Allocative control measures are viewed as compensating for the externalities caused by market failure (Vittas, 1992:6). However, an excess of such actions may prove repressive as private investors are left to compete for scarce credit. In so doing, a number of projects with higher profits and or greater benefit to total productivity are not completed.

Vittas (1992) proposes that structural controls stem from political and economic considerations. Structural controls govern the entry of financial institutions and buttress the fragmentation of the local financial market through the imposition of restrictions on the size of institutions and the range of activities they may undertake.

Prudential, organizational and protective controls are set in place to protect the customer as well as to fortify the financial system. Prudential controls endeavour to minimize the risk of systemic

failure and they include regulation measures on capitalization, management, risk management and enforcing accounting policies (Vittas, 1992:7). Protective controls are measures set in motion to safeguard the customers of financial services from problems created by information asymmetries, which according to Vittas (1992:5) may include compensation funds and ombudsman offices. On the other hand, organizational controls seek to bridge the gap created by externalities. These are caused by the existence of markets such as the stock exchange, other trading exchanges, payment clearing systems and information networks. Thus organizational controls encourage the disclosure and flow of information in the market with a view to advancing market efficiency (Vittas, 1992).

Given the need to control expansion of credit and price stability, governments often impose controls on reserve requirements, interest rate ceilings, selective credit allocation methods (credit rationing), restrictions on foreign investments and importantly interest ceilings which are collectively referred to macroeconomic controls (Vittas,1992). Such controls are viewed to be targeted at maintaining internal and external equilibrium and it is also that stringent control in the financial system gives monetary authorities increased control over money supply.

2.5 THE McKINNON AND SHAW HYPOTHESIS- A THEORETICAL APPROACH

The literature on financial repression and or financial liberalization is not complete without an analysis of the influential work of McKinnon and Shaw (1973), herein referred to as MS. There is vast literature focusing on financial repression and financial liberalization on developing countries particularly Asian nations. It is noteworthy that the McKinnon and Shaw framework has become the foundation for financial policy and policy advice for LDC`s (Jankee,1999:11) The initial work of McKinnon and Shaw focused on financial repression and the need for developing economies to permit real interests rates and other financial indicators and entrants to be determined by the market. This framework strongly supports the notion that savings determine the level of investment. Traditional monetary policy has caused much disillusionment in terms of failing to focus and establish overall economic stability. Thus the search for alternative methods, i.e. the development oriented monetary policy envisioned by McKinnon and Shaw (1973).

The McKinnon and Shaw (1973) theoretical framework rests on the following tenets:

- No credit rationing in the economy,
- A real interest set below the market equilibrium rate,
- A savings investment function that is positive and positively correlated to output and growth.

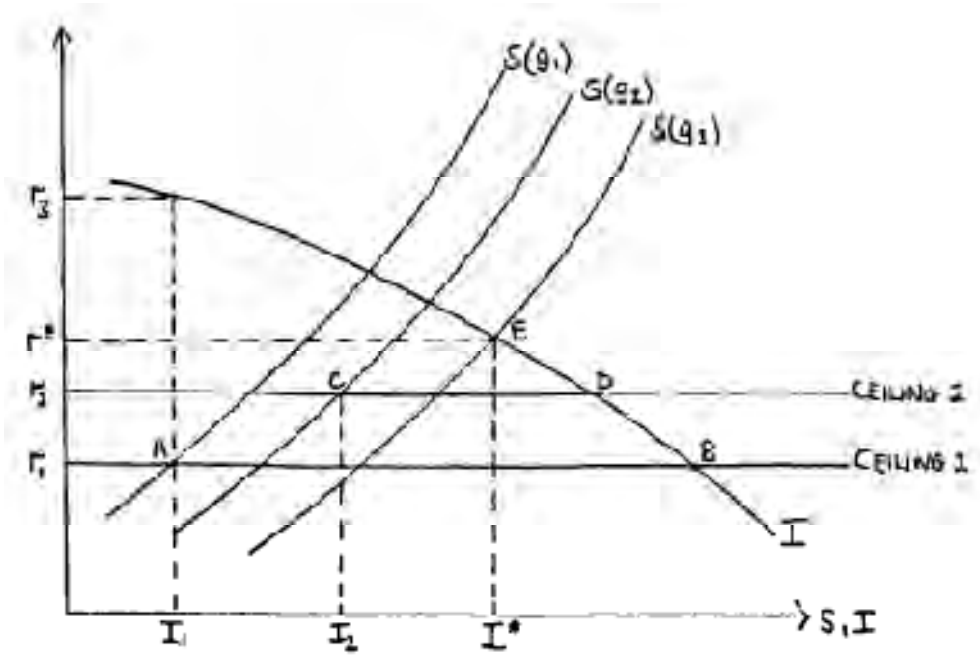
MS framework is centered on the distortions in the market caused by financial repression. Gupta (2004) highlights three main aspects of financial repression. These are the banking system which is compulsorily required to hold government bonds and money through the imposition of high reserve and liquidity ratio requirements because it allows the government to finance budget deficits cheaply. Since revenue may not be earned easily from private securities. The development of private bond and equity markets is discouraged. Lastly, the banking system is characterized by interest rate ceilings to prevent competition with public sector fund raising from the private sector and to encourage low-cost investment. Accordingly Fry (1997) argues that interest rate ceilings in a repressed system, affects the economy in four crucial ways. Current consumption is favoured instead of future consumption. Potential investors embrace relatively low-yielding investments instead of lending to financial institutions via deposits. Due to depressed interest rates, borrowers prefer capital-intensive projects. Lastly, the pool of borrowers consists mainly of individuals or businesses that have low-yielding business ventures. Thus, financial repression is manifested directly through: interest rate ceilings, compulsory credit allocation, and high reserve requirements. Giovannini and de Melo (1993) also hold similar views of financial repression, arguing mainly that governments stand to gain substantially from repressing the financial sector. Serieux (2008) enlarges the net of characteristics that may be associated with financial repression as low ratios of real money to national income, small and oligopolistic financial sectors which are dominated by intermediation in short term assets, large government deficits and financial dualism espoused by capital intensive modern sectors serviced by low cost foreign exchange and low interest finance, while the labour intensive traditional sectors are financed by informal finance and barriers to entry into the banking sector, thus reducing competition (Serieux, 2008)

Figure 2.1 aims to explain the interaction of market forces in the market for funds thus highlighting the financial repression paradigm. In fig 2.1, the horizontal axis is a measure of investments and savings as they are assumed to be positively related, while the vertical axis shows interest rates.

In order to proffer an apt graphical illustration of the process and to ascertain *a priori* expectations for financial liberalization, the diagram shows initially a situation of extreme financial repression, where the interest rate ceiling is set at ceiling 1. The amount saved and invested will be *i1*, at point *A*. In this case if the ceiling is on deposit rates only then the bank will profit from the margin *r3-r1*. The interest rate ceiling results in a shortage of credit in the market. This shortage is shown by the distance between point *A* and point *B*. Thus, a shortage for credit in the market will lead to the need for credit rationing, i.e. the selective allocation of credit to sectors and or projects deemed by the state to be of great benefit and better return.

The movement to *r2* signifies a slight move to financial liberalization as the second interest rate ceiling is close to the equilibrium rate E, dictated by the "invisible hand". At this interest rate, *r2*, the level of savings and investment increase. The rate of growth moves to *s (g2)*, as an increase in investment leads to a rise in economic activity. This is in line with the assumptions of the MS framework. In this case the shortage of credit is less than when interest rates were at ceiling 1. The shortage has a lesser magnitude represented by *CD*. Thus the government will not need to ration credit to the same extent as at ceiling 1.

Figure 2.1: Theoretical MS paradigm



Adapted from: Jankee 1999

In the final stage, full financial liberalization is attained when the market forces are allowed to determine the market equilibrium at *E* with a concomitant rise in savings and growth. Due to this rise in interest rates to *r**, the savings rate increases to *I** as the returns on savings are higher. Thus increasing interest rate increases the efficiency of investment. Hence as investment increases growth rises in the economy *s (g3)*.

As illustrated in figure 2.1, MS framework clearly advocates for a removal of distortions on the financial factors and prices such as interest rates, exchange rates as they retard the process of financial intermediation. Thus the MS concludes that in order to warrant economic growth through greater efficiency in the accumulation and allocation of capital, it is of paramount importance to ensure the elimination of interest rate ceilings, credit rationing programmes and other restrictive legislations that produce sub optimal results (Cho, 1984).

2.5.1 Financial liberalization as a catalyst for investments and savings

One of the key assumptions of the MS theory is that savings are positively related to interest rates and more importantly to growth and output (McKinnon and Shaw, 1973). This theoretical underpinning is avidly supported by authors who put forward theories of this relationship before the seminal work of McKinnon and Shaw (1973). The Harrod and Domar model set out to explain economic growth as a function of the savings rate and marginal productivity of capital.

Geerdink and Stauvermann (2007), summarises the suppositions of the Harrod Domar model as:

- Output is a function of the stock of capital $\ddot{Y}=f(K)$,
- Marginal product of capital is assumed constant and the production function displays stable returns to scale $\Delta y/\Delta k=C$, $\Delta y/\Delta k=Y/K$.
- In order for production to take place, there must be capital outlay.
- Savings are equal to investment, S=I.

Geerdink and Stauvermann (2007), incalcate the assumptions and derive a similar final equation for the harold and Domar model as:

$\dot{K}=1/K-\delta=sY/K-\delta$, (2.1)

$\ddot{Y}=sc-\delta$ (2.2)

Geerdink and Stauvermann (2007), summarise the Harrod and Domar model by simplistically explaining the equation 2.2 as the economic growth Y is a determinant of the savings rate s and the marginal productivity of capital less the depreciation δ. The equation clearly shows that savings is an important component in economic growth, through investment. However, the accumulation of investment is not a function of savings, as savings merely facilitate investment. They are not able to aid the accumulation of capital (Arestis, 2005). This is essentially a task for the financial intermediaries. Umoh (1995) explicates that proficient capital formation and accumulation structures arise within a financial system where financial institutions adequately execute their financial intermediation tasks. Thus, if these financial intermediaries are restricted in operating to fulfil their profit maximazation objective, then capital accumulation is retarded while financial intermediation is restricted. Furthermore, with regard to the savings and investment nexus, the MS framework and Harrod Domar model assumes that savings create investment. Arestis (2005), simplifies this notion as deposits create loans. However, in the modern banking systems loans create deposits. Faure(2003), in a document entitled a "Beautiful system", clearly articulates and sets out to correct the widely misconstrued myth that deposits create loans. The credit creation process does not begin with a deposit as outlined by (Parkin *et al*, 2010). Instead, through a simple accounting entry, banks can create money, thus money is created primarily by loans.

The theories analyzed above show that there is a general consensus that savings act as a catalyst for economic growth through investment (Mckinnon, 1973; Cho, 1984; Umoh, 1995; Faure, 2003 and Arestis, 2005). Thus, it is possible that policies linked to financial development or financial deepening is capable of leading to economic growth.

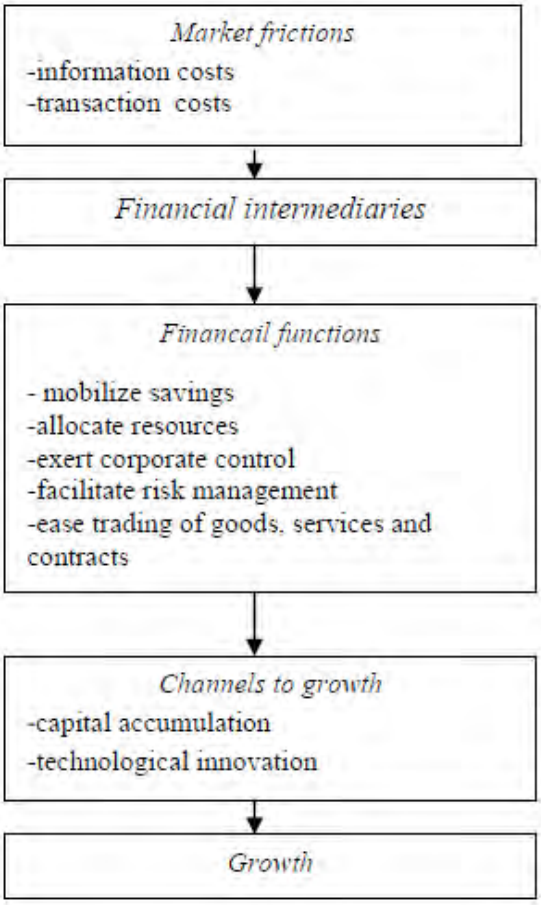
2.5.2 Financial development and economic growth

Economists hold differing views on the relationship between financial development and economic growth. In this debate two main arguments emerge namely the argument by Schumpeter (1911) and Robinson (1952). Schumpeter asserts that innovations provided by the financial sector are key drivers of economic growth. Robinson (1952), on the other hand, argues that "where enterprise leads finance follows", implying that economic growth determines financial development.

The Schumpeter (1911) view is widely supported by many researchers (McKinnon, 1973; Shaw, 1973; Fry, 1988 and Pagano, 1993). The finance growth link is further cemented by Levine

(1997) who sets out the chain of events. Firstly, the financial intermediaries arise because of market frictions and fulfill the functions of mobilizing savings for investment, risk management etc. Growth in this model occurs through capital accumulation and technological innovations. This is in line with the assertions of the Harrod and Domar model where economic growth occurs through technology i.e. the steady state. The theory proposed by Levine (1997) is set out in figure 2.2.

Figure 2.2: Theoretical link between finance and growth



Source: Levine 1997

The Robinson (1952) view is propagated by Berthelemy and Varoudakis, 1996 who argue that increased economic growth may lead to a rise in the demand for financial services and spur financial innovations. The financial sector is induced to expansion by the growth in the real sector. However, both sides are reconciled as financial development is identified as integral to economic growth.

2.5.3 Financial liberalization and economic growth

The preceding literature has aptly set out a case that financial repression through its many repressive means yields results that adversely affect economic efficiency and impedes economic growth. The MS framework aims to explain the link between economic growth and financial development, via the Gurley and Shaw (1955) debt intermediation theory. Gurley and Shaw (1955) indicate that an increase in savings gives rise to more financial intermediation that feeds into investment and ultimately economic growth. Arestis (2004) alludes to this theory, as he outlines that the role of savings is to facilitate investment. However, what is more important is the way the savings are utilized in accumulating capital and ensuring efficient investment. This is a function of financial intermediation.

Financial liberalization is a process aimed at removing the restrictions or deregulating local financial markets. Mainly through the lifting of repressive legislation especially the lifting of ceilings on interest rates, exchange rates (Seriuex, 2008). Deregulating the market will also involve encouraging the development of capital markets and spurring the activities of financial intermediation by providing an appropriate climate for savings and investment. The barriers of entry into the financial markets should also be reduced, to allow the participation of a broad spectrum of savers and investors, thus again the market should be allowed to determine the optimum number of participants (Serieux, 2008)

A wide range of literature has probed the existence of a relationship between financial liberalization and economic growth (Levine, 2001; Bonfiglioli, 2005; Levine and Zervos, 1998). However, the theoretical predictions are ambiguous. Nevertheless, there seems to be some consensus regarding the issue. Obstfeld (1994) and Bonfiglioli (2005) agree that international competition resulting from deregulation of local financial markets may also improve the working of the domestic financial market.

A theoretical position is offered as to why financial liberalization may not lead to economic growth. Hedge effects are proposed in this regard (Arestis, 2004). Hedge effects occur when there is substitution of hedge assets such as gold and land. Therefore, proponents of economic growth emanating from financial liberalization assume hedge effects. Thus, when hedge effects do not occur i.e. the substitution of hedge assets for bank deposits due to the higher interest rates, then there is no increase in savings and total supply of funds. (Taylor, 1983 in Arestis, 2004:12). Thus the predictions of the MS framework and other supporters of a positive

economic effect of financial liberalization face a theoretical hurdle form the hedge effect. However, hedge effects have not yet been empirically tested.

2.6 EMPIRICAL LITERATURE

Much of the empirical literature seeks to ascertain the link between financial liberalization and economic growth. Studies have centered on the workings of the transmission mechanisms proposed in the financial repression MS framework. Consequently the data surveyed is based on the review of empirical literature which emanates from the studies that challenge or reassert the theoretical underpinnings. Whereas some studies have endeavoured to determine the link between interest rates and level of saving (Giovannini, 1985; Fry, 1988 and Serieux, 2008). Others focused on the effects of availability of credit on investment (Fry, 1981; Gibson and Tsakalotos 1994; Warman and Thirwall, 1994). A great many have assessed the link between financial development and/or financial liberalization on economic growth (Levine, 2003; Adam, 2007 and Odhiambo, 2009).

2.6.1 Savings and interest rates

Giovannini (1985) studied the effects of savings on interest rates in eighteen developing countries and concluded that in the bulk of cases, the reaction of consumption growth to changes in the real interest rate is insignificantly different from zero. It is therefore prudent to expect insignificant responses from total saving to the real interest rate. On the contrary, Fry (1988) approximated a pooled time series of savings function for 14 Asian developing countries by assuming a similar posit of MS framework that savings is a function of income growth. In this study it was established that real interest rates had a positive and significant effect on national savings. Likewise a more recent study by Serieux (2008) of 19 African countries proves that there is a high correlation between savings and interest rates for the sub Saharan countries studied for the period between 1965 and 2003. A study of Latin American and Asian countries by Gupta (1987) to address the topical issue of aggregate savings determined by interest rates through financial intermediation. Financial repressionists of the MS framework claim that the positive substitution effect dominates the negative income effect in developing countries. On the other hand, the financial structuralist's contend that financial intermediation directly affects savings which is set apart from the effect of interest rates. As such Gupta found that there was no overwhelming empirical support for either of the two schools of thought. In Asia, there is some

support for both, but for Latin America, neither of the two hypotheses receives any support. However, it is noteworthy that in this study that both groups had a positive sign, which adds weight to the MS framework postulations that increased interest rates, would lead to a rise in the savings rate.

The relationship between interest rates and savings is not written in stone. As such other researchers have countered this neo-classical economics notion and the MS framework of a positive and causal relationship between savings and interest rates. Micksell and Zinser (1973) showed that interest rates did not affect the propensity to save. However, interest rates were important in ascertaining which channels that saving would follow. This notion is also supported by Seriex (2008). Warman and Thirlwall (1994) in their survey of Mexico for the period stretching from 1960-1990 also found that interest rates had a positive effect on financial savings but a negative outcome on aggregate savings.

2.6.2 Credit Availability and Investment

MS framework postulates that in a financially repressed market, the sub-equilibrium interest rates result in a shortage of funds in the market. Governments aim to bridge this gap by using credit rationing programmes aimed at selectively rationing available credit to projects that are deemed to proffer the highest returns to society. However, some researchers argue that credit rationing will lead to inefficient rationing of credit as the projects that receive finding may not be necessarily the most profitable.

Fry (1981) established a positive link between credit and the interest rate and between investment and credit availability. Moreover, in studies done for Mexico for the period 1960-90, it was found that investment is positively linked to the supply of credit from the banking system but found the net effect of interest rates on investment to be negative (Warman and Thirwall, 1994). On the other hand there are researchers that established negative relationships between credit availability and interest rates (Greene and Villanuaeva (1991); Demetriades and Devereux (1992) and Gibson and Tsakalotos (1994)). More specifically, Greene and Villanuaeva (1991) studied 23 countries, among them, developing countries such as Mexico, Sri Lanka, Venezuela and Zimbabwe. They used a pooled time-series, cross-sectional approach. Econometric analysis of this study evidenced that the rate of private investment is significantly and positively linked with GDP growth, and the rate of public sector investment, and negatively related to real interest rates. Similarly Demetriades and Devereux (1992) used a sample of 63 countries during the

period 1960-1990. They found that higher domestic interest rates had a significant and negative effect on investment. As such, from these studies and the empirical validity vested in them, it can be argued that financial liberalization has an adverse effect on the level of investment.

It is important to note that in financial liberalization it is not enough to attract investments without evaluating the efficiency of those investments. Bonfiglioli (2005) assesses the impacts of financial liberalization and their effects through separate channels i.e.: income growth: capital accumulation and productivity. This study involved a sample of 93 countries surveyed over the period 1975 to 1999. The empirical evidence suggested that financial liberalization has a modest effect on capital accumulation yet a significant positive effect on total factor productivity through financial deepening.

Ghosh *et al* (1999) highlights through the theory of micro lending institutions in order to attain optimal results i.e.: restraining default risks dictate limits on repayment burdens. Such can be attained by limiting loan sizes below what borrowers' request. The phenomenon of micro-credit rationing prevents interest rates from rising to excessively high levels. This assertion shows that there are merits to both financial repression and liberalization. As Ghosh *et al* (1999) impress upon the fact that high interest rates may help to counter adverse selection and avail more formal credit as espoused in the financial liberalization literature. However, elements of repression are also important i.e.; in terms of regulations that entrants must abide by in term of protective controls.

2.6.3 The growth link

Many empirical studies on the link between finance and growth have been dominated by cross-country studies until recently due to the lack of sufficient time series data for developing countries. Such studies have constantly established that financial development is a key determinant of economic growth (Ang and Mckiibbin, 2007; Bonfiglioli, 2005; Levine and Zervos, 1998; Rousseau, 1999). More specifically, Levine and Zervos (1998) studied 31 developing countries and found that stock market liquidity and banking development positively predict economic growth, capital accumulation, and productivity development when entered together in regressions. Furthermore, there are many ways that financial development and economic growth may relate to each other (Khan and Senhadji, 2000). An assessment of the relationship between finance and economic growth of 77 developing countries over the period 1960-89 was studied by King and Levine (1993). They found that each financial indicator was

positive and significantly correlated with each growth indicator at the 99 percent confidence level. Bakaert *et al* (2001), conducted a cross sectional study of about 95 countries. They also constructed a financial liberalization indicator based on official liberalization dates in different countries. The official liberalization indicator took a value of one when the equity market is liberalized and zero otherwise. Through an empirical analysis Bakaert *et al* (2001) observed that financial liberalization positively influences real GDP growth by 1.13% over a 5 year period.

Despite the enormous support of the link by several authors, several researchers have articulated a number of doubts about the limitations of cross section approach and its results. The suspicions on the results emanate from possible heterogeneity of results and lack of robustness. Such misgivings manifested through a study by Arestis and Demetriades (1996) who counter the causal analysis of the correlation between economic growth and financial development by King and Levine (1993). Arestis and Demetriades (1996) argue that this analysis is based on a weak statistical basis. By utilizing exactly the same data set, Arestis and Demetriades (1996) provide evidence that the contemporaneous correlation between the major financial indicator and economic growth is stronger than the correlation between lagged financial development and growth. Moreover, Ayadi (2006) joins the bandwagon against the positive relationship between financial liberalization and economic growth. Ayadi (2006) asserts that Nigeria`s efforts to liberalize the financial markets failed dismally from the period reviewed, 1987 to 2001. Cointegration and error correction models were used on quarterly wholesale and retail interest rates from 1987 through 2001 to evaluate their long short-run dynamics. The reform policies failed to yield any positive result on the financial sector as the oligopolistic structure persisted, failure to ensure market driven interest rates, interest rates spreads remained high. As such this did not improve the prospects of using interest rates as a means for the Central Bank of Nigeria to manage the banking system.

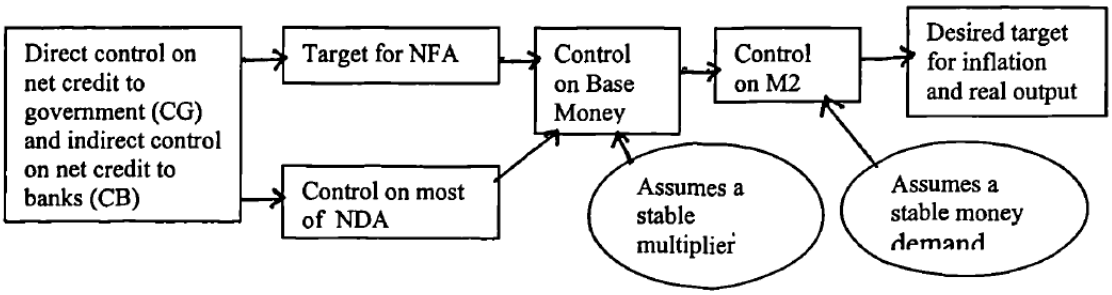
Other researchers are even more pessimistic about the link between financial development and economic growth. This school of thought articulates that financial liberalisation polices actually exacerbates the effect of financial crises. Arestis (2004) puts forward that 66% of the IMF member countries experienced baking crises since 1980 to date. Furthermore, 90% of the African and Asian members experienced at least one banking crisis. The crises have been more frequent and severe in developing countries compared to developed countries.

2.7 INTERACTION OF MONETARY POLICY AND FINANCIAL LIBERALIZATION

As communicated in Giovannini and de Melo (1993), the primary *raison d'être* for financial repression is because governments are able to extract significant seignorage from the financial markets, exercise sizeable and direct control of money supply through direct instruments of monetary policy (Brock, 1989) and compensate for externalities generated by market failure (Vittas, 1992). The main elements of financial repression directly and/or indirectly affect monetary policy actions particularly regarding interest rates, the structure of the banking industry among other issues (Serieux, 2008).

One of the most important aspects in regulating monetary policy is the conjecture of a stable demand for money. Therefore, in attempt to achieve main objective of monetary policy i.e. control of inflation, a broad monetary aggregate is the target for direct monetary control. The illustration below adapted from Roe and Sowa (1997) shows the operations of a direct control approach to monetary policy.

Figure 2.3: Interactions in a system of direct monetary control



Source: Roe and Sowa (1997).

The direct approach assumes a stable multiplier and stable money demand function. Countries aim to achieve this stability through financial repression i.e. through aggressive control of credit creation ability, through forcible holding of government bonds, prohibitive reserve requirements and interest rates below the market equilibrium which subsequently stifles the growth of capital markets in the domestic financial sector. However, due to the lack of predictability of economic variables the direct control method and financial repression are bound to yield sub optimal

results. Furthermore predictability in this day and age cannot be guaranteed due to the emergence of various financial instruments which are not easy to monitor. Hence the classifications of money have progressed from only M1, M2 and M3, as some countries have M4 and M5 (Faure, 2009).

As such and through a review of literature, there is a strong case for financial liberalization, where financial liberalization implies a move away from direct methods of monetary control. There is overwhelming empirical evidence of the success of indirect means of monetary policy in a financially liberal financial system (Galbis, 1995). This is the case in developed countries i.e. they have financially liberal financial markets primarily whose interest rates are market determined. Even though the Taylor rule is applied when monetary policy authorities sets the initial interest rate deriving the value from differences in actual inflation from target inflation rate and similarly for current GDP and target GDP (Woodford, 2001). However there are impediments and sequencing concerns that must be highlighted for successful financial liberalization. The level of financial deepening of the domestic banking system and the magnitude of the fiscal deficit are crucial factors that may interrupt successful adoption of indirect instruments of monetary control and effective financial liberalization (Roe and Sowa, 1997). This is because insufficiently capitalized banks are not able to respond to market signals of effective monetary management. Popiel (1994) accentuates this point empirically through a study of 20 African countries and the incidence of banking distress, showing that even though the countries attempted financial repression they were not ready, thus they should have first restructured their financial systems.

From such an observation it becomes clear that it is important to consider sequencing of financial liberalization policies as explained in the MS framework (Mckinnon and Shaw, 1973). This position was echoed by the Bretton woods institutions in the 1990`s when several developing countries embarked on financial liberalization through the mantra "stabilize, privatize and liberalize". To empirically validate the importance of sequencing in financial liberalization Bisat Johnston and Sundararajan (1992) studied financial sector reforms in Argentina (1977-1980), Chile 1975-1981), Korea (1980-1988), Indonesia (1982-1985) and the Philippines (1980-1984) established that countries which deregulated interest rates, credit controls early in their financial liberalization programmes (Argentina, Chile and the Philippines) experienced significant financial deepening although losing control over domestic financial aggregates. However, those that gradually liberalized i.e. South Korea and Indonesia did not lose control over monetary

aggregates. On the contrary Johnston *et al*, (1997) argues through empirical studies that countries that undertook correct sequencing did not experience positive results for example Chile.

2.8 SYNOPSIS

The literature survey set out to highlight a number of pertinent issues surrounding the topical issue of financial liberalization through review of theoretical and empirical literature. An effort is made to review the links between the finance and the real sector. Even though researchers are yet to agree on the causality, there is consensus that it is vital for the financial sector to develop in line or to cause growth. Secondly, the review also examines the transmission mechanism, the channels in which interest rate affects the economy. It can be inferred that, in an open economy all the channels of monetary policy are important in transmitting monetary policy actions in the economy thereby mirroring modern day dynamics.

Section 2.2 focused on the types and rationale of financial repression. It is noteworthy in this case that some necessary controls can also be repressive. Therefore, in all economies the tools of financial repression are present in the form of regulatory controls that are necessary to ensure the efficient *modus operandi* of the financial system. That, in light of financial crises some controls are likely to be increasingly applied to stem financial innovation and its adverse unintended consequences. Following this section is review of the Mckinnon and Shaw (1973) framework of financial repression, which sets the stage for financial liberalization. It shows the negative effects of financial repression on the economy, growth, investments and savings.

In order to analyze the MS framework fully i.e. it's various assumptions, subsequent conclusions and policy recommendations. An extensive review of empirical literature is set out, highlighting empirical evidence on few selected yet vital variables viz; savings and investments, credit availability and the growth link. The literature is full of varying assertions backed by empirical data however; more recent papers seemed to have a bias to the policies of financial liberalization.

Lastly, there was a brief analysis as to the potential link and implications of financial liberalization towards monetary policy. This was done through a brief outline of direct monetary policy usually experienced under a repressive financial system. Contrasting this with indirect monetary control methods that seem more desirable in light of the theoretical and empirical assertions of financial liberalization literature.

CHAPTER 3:

OVERVIEW OF SOUTH AFRICA`S ECONOMIC AND FINANCIAL SYSTEM

3.1 INTRODUCTION

This chapter sets out to review the evolution of financial reforms and key economic indicators that relate to financial liberalization for South Africa. As many changes must occur from the extreme financial repression regime explained by McKinnon and Shaw (1973) to a situation of financial liberalization. However, it is important to note that financial liberalization is a gradual and complicated process involving numerous reforms. To this end South Africa experienced structural market changes in the economy at the turn of the twentieth century. Firstly, there was gradual movement from non market controls (repressive) toward the more market oriented policies (liberal).And secondly, changing from a siege economy to a more open economy meant to cater for a multiracial democratic political framework post 1994 (Strydom, 2000).

The main objectives of this study are the assessment of the extent to which the MS framework (1973) is borne out of the South African economic data with particular attention on financial development, financial liberalization, economic growth and the savings, interest rate and investment nexus. In light of this, it is important to proffer an overview of the South African economy and these variables including selected macroeconomic indicators. These will be used to assess whether through visual inspection, any links and or trends may be established. The remainder of the chapter is organized as follows: the second section proffers South African economic background by highlighting pertinent trends and indicators such as economic growth, savings and interest rates among others. Section 3.3 provides a brief highlight of trends in financial development while section 3.4 provides information regarding the banking sector in South Africa. A brief discussion on the relevant reforms regarding domestic financial liberalization is reviewed in section 3.5. Section 3.6 concludes the chapter.

3.2 SOUTH AFRICAN ECONOMIC BACKGROUND

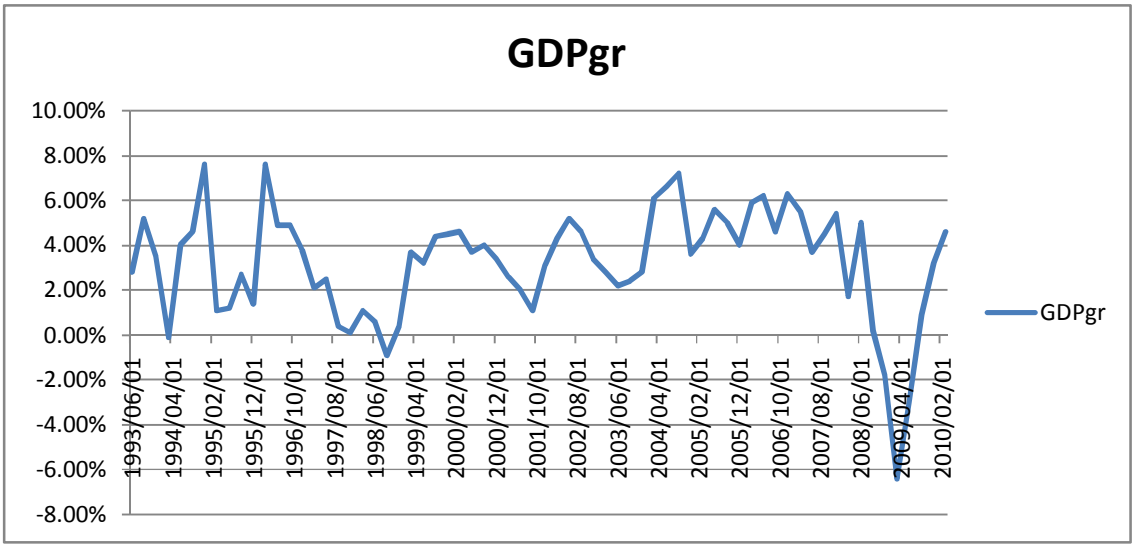
South Africa has a two tiered economy as articulated by Mbeki (2003). Mbeki (2003) further expressed the view that the second economy is the one with the majority of the population and yet contributes little to GDP, while the first economy is characterized by first world infrastructure and services. This notion also contains financial sector connotations, since this

second economy is under banked and with it brings a challenge to amalgamate its *modus operandi* of savings and investment into the main stream economy. However South Africa is generally regarded as the economic powerhouse of Africa due to its abundant natural resources, well developed transport, legal, communication, financial, energy sectors and a stock market ranked in the top 20 in the world (SA INFO, 2010).

3.2.1 Trends in Economic growth

Through analysis of literature it is evident that GDP is an important financial indicator. It has drawn much research as to its determinants, trends and whether it leads to or flows from changes in other indicators (King and Levine, 1993). On the macro economic front, South Africa boasts impressive figures, highlighting the nation's economic prowess. South Africa has the largest economy in Africa boasting of a GDP of US$ 280.6 billion using official exchange rate estimates (CIA, 2010). And the growth rate places South Africa as 141 on the CIA country comparison to the world. South Africa had 62 uninterrupted quarters of economic growth spanning from the first quarter of 1993 to the second quarter of 2008. The graph below shows the GDP growth rate since 1993 as measured on a quarterly basis.

Figure 3.1: Trend GDP growth rate



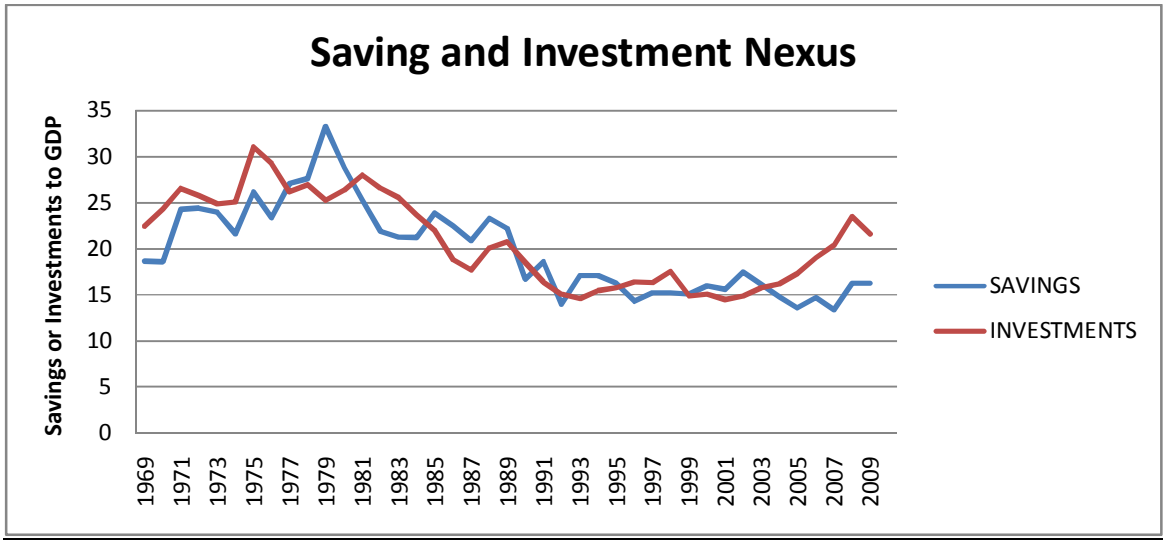
The GDP growth rate has been volatile, however, it has generally been on an upward trend since 1993. There have been two sharp declines that even recorded negative GDP growth rates (GDPgr). Firstly, in the year 1998 there was a slow down that saw a negative 1 % GDPgr. This could have been due to the Asian financial crisis that gripped much Asia, beginning with the fall

of the Thai baht and through contagion spread to its trading partners particularly in Asia(Hughes,1999). Secondly, the period 2008 to 2009 recorded a massive -6% GDPgr which could be explained by the global financial crisis impact on commodity prices and demand. The fact that South Africa`s economic fortunes in terms of GDPgr have responded to occurences in far away places such as Asia and USA shows a high level of integration of the local market to international financial markets and economies(Collins and Biekpe,2002).

3.2.2 Savings and Investment nexus

Investment is a critical component to a country`s economy. From a classical point of view, the domestic savings should equal the investment. If this relationship is not in equlibrium then classical economics proposes that the interest rate will adjust accordingly to bring equilibrium in the capital market. The graph below shows a relationship between savings and investment. Even though the relationship, by visual inspection does not exhbit a clear one to one correlation, it is evident that there is a strong relationship in the savings and investment nexus. Furthermore, Feldstein and Horioka (1980) asserted this notion through a study of a number of countries and most importatntly proffered a reason for the high correlation ie; a high correlation in the savings and investment nexus is indicative of weak international capital mobility (Cryille, 2010). South Africa shows a rather high correlation between savings and investments (Figure 3.2) which could lend credence to the FH assertion which is probable as the main indicator of investment is gross fixed capital formation. Thus, this gross fixed capital formation is not easily moved therefore the investment of a fixed nature should be financed mainly from the domestic savings.

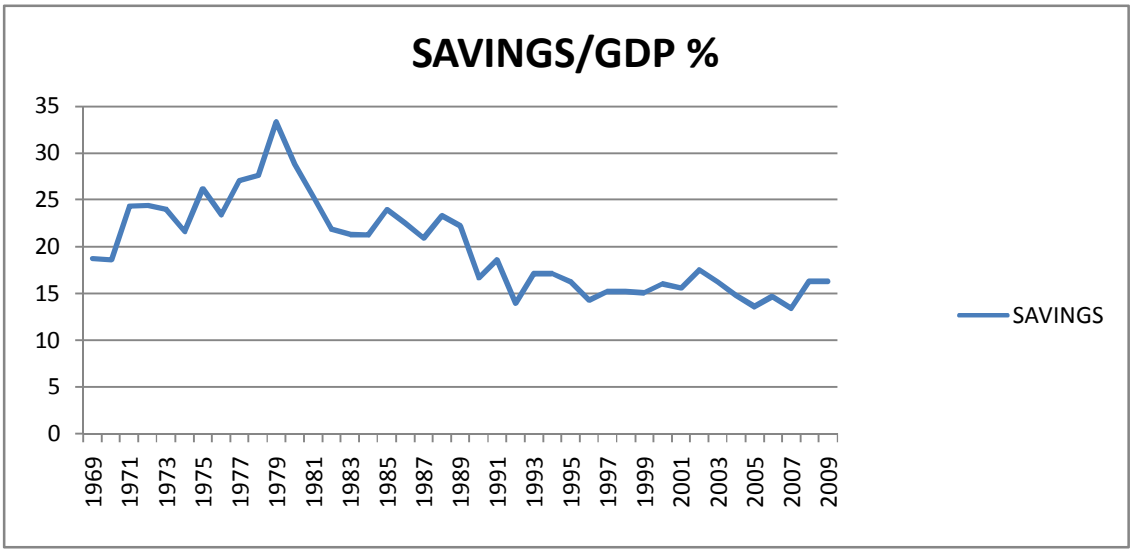
Figure 3.2: The savings and interest rate nexus for South Africa



3.2.3 Savings

The low-growth experienced by South Africa since the mid-1980s has been due to the incessant decline in national saving, and an improved national performance in respect of saving is frequently regarded as a prerequisite for higher economic growth in South Africa (Aron & Muellbauer, 2000). The main measure of a nations savings has been the Gross saving as percentage of gross domestic product as used by (Chaudry, 2006; Prinsloo, 2000). Gross saving in the national accounts represents that portion of total income generated during a certain period, which is not consumed during that period (Prinsloo, 2000). Figure 3.3 exhibits a graph of the gross saving as a percentage of gross national product for South Africa.

Figure 3.3: Savings to GDP ratio trend



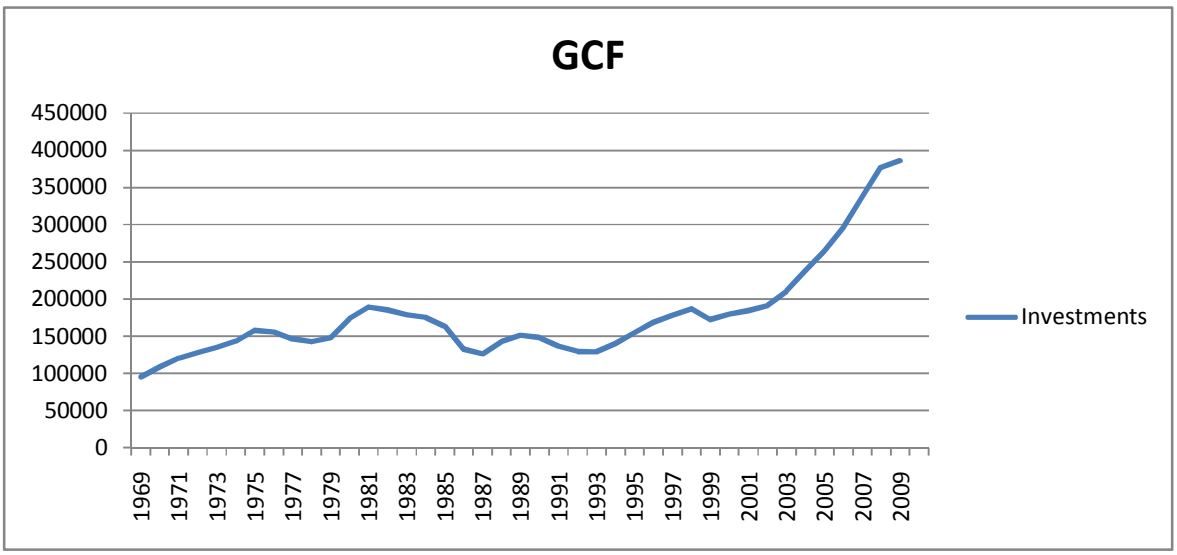
The above diagram shows a general downward trend for the proxy of the national savings rate. From a high of about 30 % in the 1980`s this rate has continued to dip and there is a distictly downward trend in the.savings rate as shown in the diagram and it further plunged below the 15% mark in 2004. Prinsloo (2000) puts forward that abrupt weakening of South African saving rate in the middle of the 1980s corresponded with a reversal of net capital movements into the country.

Interestigly in South Africa 1994 signals a marked improvement of most economic indicators, yet the opposite is true for the aggregate savings rate.this could be as a result of increased access to credit by the masses, that further entrenched a culture of dissaving.

3.2.4 Investment

Investment involves sacrifice of current consumption and the production of investment commodities which are used to generate products (Bannock *et al* 1992*:* 230). There is overwhelming evidence that capital accumulation is vital for economic growth (Bannock *et al*, 1992; Karley, 2000). However, in South Africa the easing of regulations in order to increase investments have been geared mainly towards attracting foreign direct investment. This is evidenced by the marked increase of FDI into South Africa which increased by 63% to R269.1-billion in 2005 thereby surpassing India in the FDI stakes (SA info, 2009). FDI is not neccesarily an amount that contributes to the gross capital formation, which according to the World Bank (2010) includes outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements plant, machinery, and equipment purchases; and the construction of roads, railways etc. The FDI into South Africa has mainly consisted of portfolio capital which is known to be extremely volatile. In 2008 the main FDI came in the form of the R33 billion acquisition of ABSA by Barclays capital, this transaction accounted for 30 % of total FDI in South Africa for the past six years (Luus, 2005). This signalled that most of the investment being received in South Africa was of a portfolio nature. Figure 3.4 shows the trend in gross capital formation for South Africa.

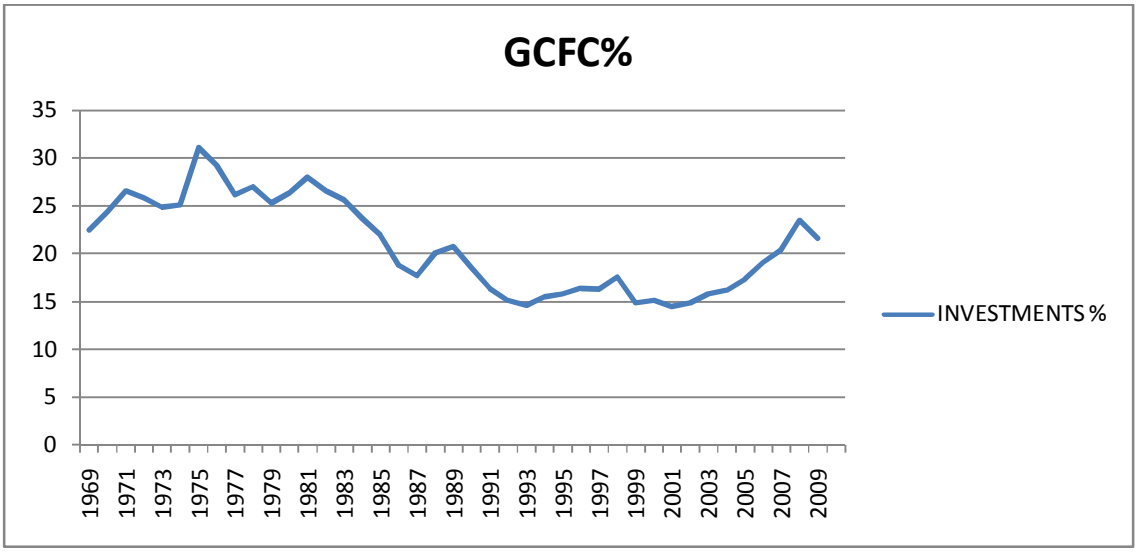
Figure 3.4 Gross capital formation



The graph show that gross fixed investment in South Africa has been on an upward trend. However, upon further inspection it is evident that from about 1975 to 1985 the gross domestic fixed investment was increasing at a decreasing rate. At this point there was a fall in the level of

investment, an increase in 1990 and then relative stagnation. There was a boom from 1995, as there is now a distinct upward trend. This shows that there was since 1980 many fluctuations in the investment rate, but it is clear that even in a apartheid closed economy of the 1980`s the liberalisation of interest rates caused an increase in the investment rate as predicted in the MS framework. However, on inspecting another relative measure of investment (GCFC) which is widely used in literature (Chaudry, 2006) as a measure of gross fixed investment – a ratio to GDP. The results differ widely even from visual inspection the graph of gross fixed investment relative to GDP (GCFC) is shown below:

Figure 3.5: Gross capital formation as a ratio of GDP



From 1985 there is actually a marked decline in gross fixed investment to GDP. The decrease could be as a result of the capital flight problems that South Africa experienced preceding the re-introduction of the financial rand in 1985. This decline continues until about 2003 where there is rises even through the recession period 2008. The reasons for this strange trend could be numerous; however another prudent reason could be that even though gross fixed investment increased in the economy, the growth of economic activity as measured by GDP outstripped the growth in investment and furthermore that investments do not necessarily affect GDP positively.

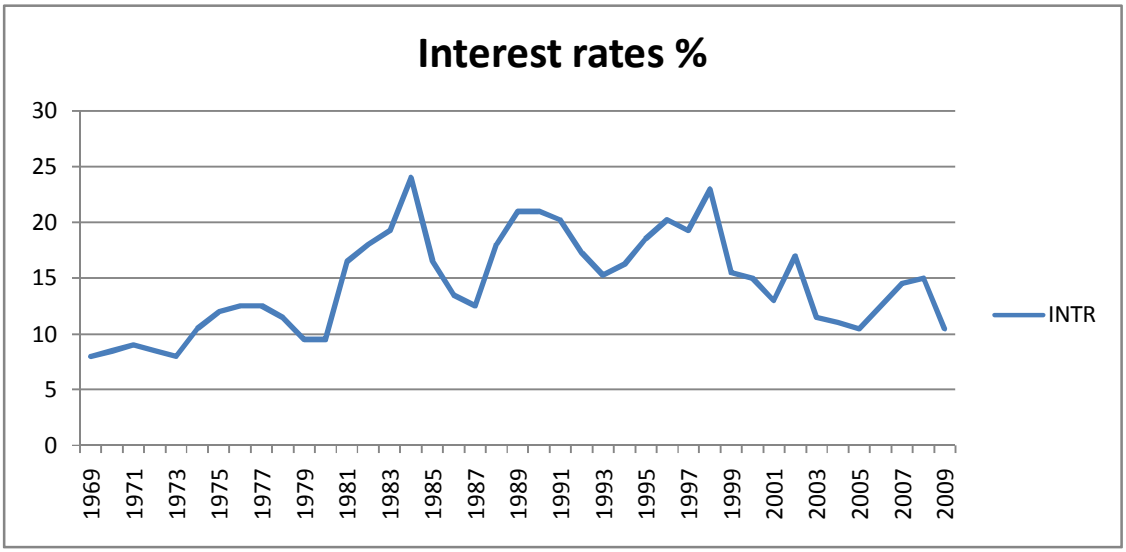
3.2.5 Interest rates.

In the MS framework the liberalisation of interest rates is a major component of the process of financial liberalisation. As extreme financial repression entails the suppression of interest rates

below market rates through government directive and or legislation. Interest rates in South Africa were left to market forces before the wave of the Washington consensus reached many developing countries in the 1990`s through the IMF structural adjustment programmes. The partial liberalisation of interest rates in South Africa was in part due to the inflation rate which rose rapidly and grew out of step with that of the major trading partners (Strydom, 2000:2). The authorities wrongly pursued an expansionary monetary policy instead of a contractionary stance. Therefore, an inflationary cycle ensued and further accelerated from an average rate of 4.3% pa in 1970 to 15.7% pa in 1975. This brought about the De Kock commission that lead to short term interest rates to follow market signals and thus fluctuate with the business cycle (Strydom, 2000).

In South Africa, the interest rate used as a reference by commercial banks in advancing variable interest rate loans to their customers is called the prime interest rate (Liberta, 2010). The trend of this interest rate is depicted in figure3.6 in graphical form.

Figure 3.6: Interest rate trend



The above figure shows the prime overdraft rate for South Africa that spans 41 years on a yearly basis. The graph clearly exhibits repressed tendencies from 1969 to 1980, where there is a steady rise in the interest rate. It must be noted that during this period interest rate were not the main instrument of monetary policy and varying interest rates applied to different sectors. Sharp peaks and troughs are evident from 1980 going forward. This shows the prime rate taking a cue from the business cycle, which was relatively volatile. And to further augment the proposition that SARB was taking cues from the business cycle, the peaks in the interest rate coincided with

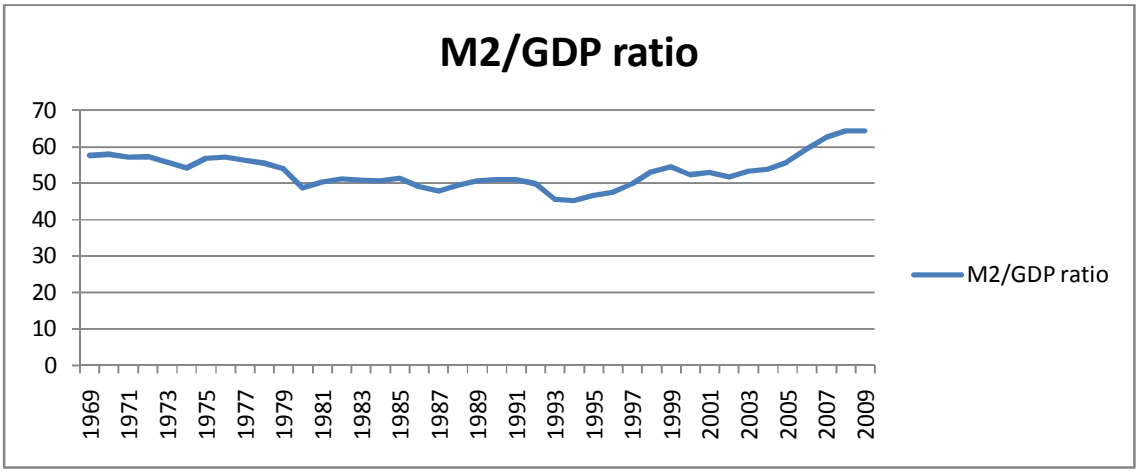
peaks in inflation of 1986, 1990 and 1999 (Akinboade *et al*, 2007:3). The rise in inflation was quickly met with rises interest rates.

3.3 TRENDS IN FINANCIAL DEVELOPMENT

This section seeks to analyze the trends in financial development through two traditional measures of financial development proposed by literature. The main idea in measuring financial development is to ascertain measures of intermediaries' ability to lessen information and transaction costs, facilitate transactions, mobilize savings and manage risks (Ang and McKibbin, 2007:219). The idea is very simple but there is no directly measurable or reliable data available. Thus through extensive study of literature several measures will be explored to determine a trend in South African financial development.

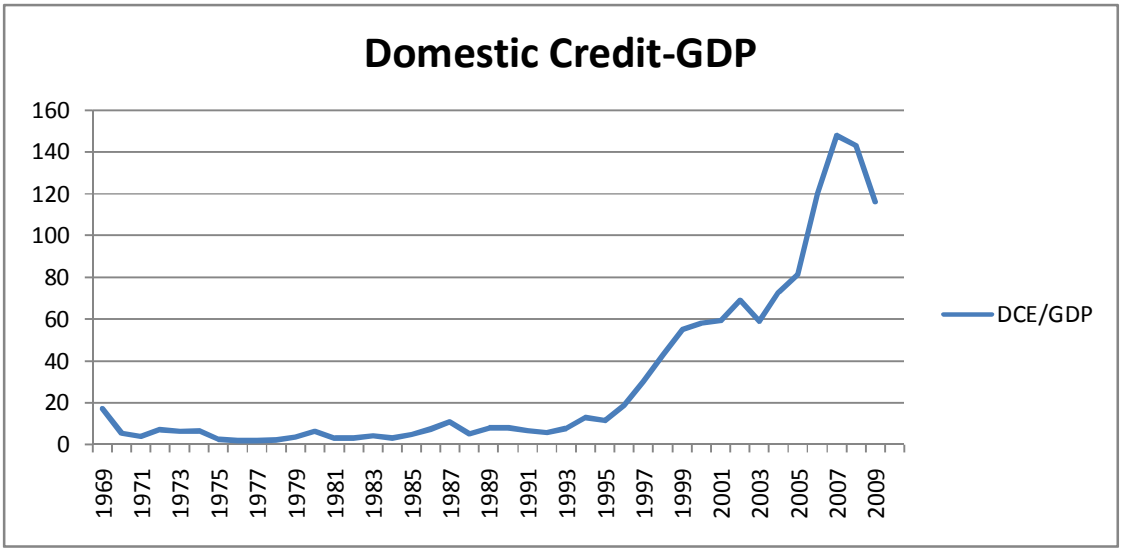
Firstly the traditional financial deepening indicator ie: M2/GDP reveals the extent of transaction services provided by financial system (Lynch, 1996). Furthermore the presence of foreign funds in the financial system may make the broad money aggregate M2/GDP a poor measure of financial development. The trend analysis will aid in understanding the behaviour of the observed trend and ascertaining whether there is a noticeable relationship between financial development and economic growth. The M2 ratio exhibits and upward trend form about 1995. However, before that there is a downward trend from about 58% of GDP in 1969 to about 45% of GDP in 1993. The quantitative controls may have been the reason for the downward trend in line with inflation control and general economic stability concerns. This signifies lessening financial development in those years.

Figure 3.7: Broad Money Aggregate trend



The second measure is the domestic credit extension to the private sector which is widely deemed to be a superior measure of financial development. The private sector is argued to be able to use funds more productively and efficiently in comparison to the public sector (Von Furstenburg, 2007). This measure shows an upward trend beginning in 1993 and continuing to grow and peaking in about 2007. Thereafter a steady decrease can be observed. This could be attributed to the financial crisis that gripped the financial markets from 2007 to 2010. The diagram is presnted below in figure 3.8.

Figure 3.8: Credit extended to the private sector as a ratio of GDP



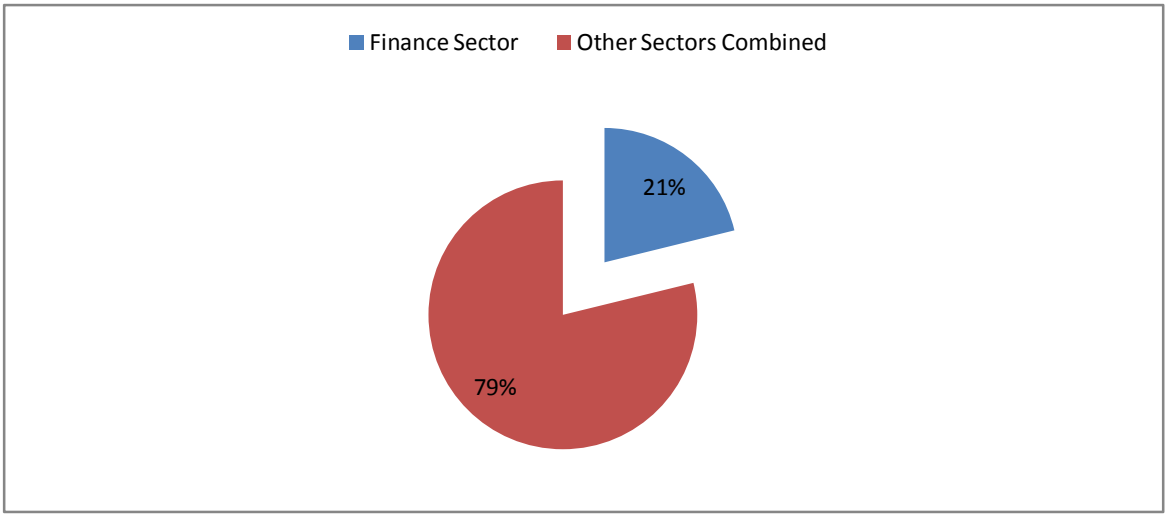
3.4 THE BANKING SECTOR.

As the largest repository of a nations money, the banking sector plays a critical role in the overall functioning of the economy. The main functions of a bank and the banking system were identified by Roland (2008) as ensuring the flow of funds between economic agents. Secondly, it mobilises resources in the form of savings by inturn offering attractive investment opportunities. And lastly, banks pool resources and allocate them as loans to viable investment projects.

In South Africa there exists a well functioning banking system that consists of 20 registered banks. According to SARB (2009) the number includes 14 registered South African banks, 6 non-resident controlled banks, 2 mutual banks, 14 local branches of international banks and 42 international banks that have authorised representative offices in South Africa. Despite the seemingly competitive environmrent portrayed by the above figures the banking sector remains largely the domain of four major South African groups viz: Absa group, FirstRand Bank group,

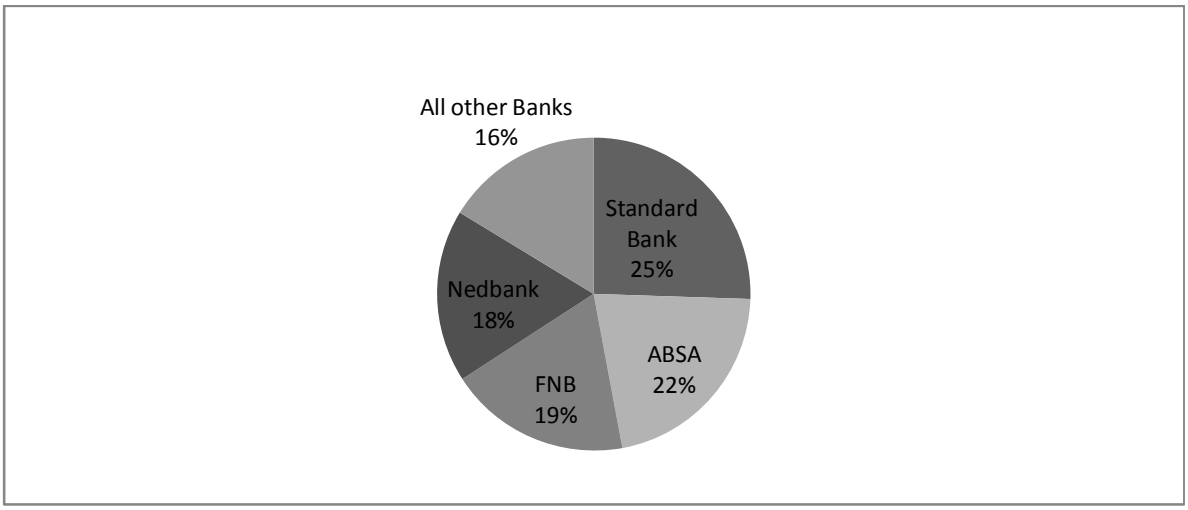
Nedcor and the Standard Bank group. These four major banks control a massive 84% of the retail banking market share (South African Banking Assocition, 2010). As such a study into the banking structure lead by the Competition Commission found that the local South African banks formed a 'complex monopoly (Standard Bank,2005). Furthermore the South African financial sector i.e. banking, real estate and business services contribute a significant 21.2 % to GDP. These proportions that highlight contribution of the financial sector to the overall economy and the bank concentration are shown below in figures 3.7 and 3.8 respectively .

Figure 3.9: Sectotal Distribution of GDP



Source: The Banking Association of South Africa

Figure 3.10: Sectoral Analysis of the South African Banking Sector



Source: The Banking Association of South Africa

The South African banking sector has undergone numerous changes that have made it a world class system. The noteworthy achievements of the sector include compliance to Basel II regulations and strict accounting regulations in line with Generally Accepted Accounting Principles (GAAP). Furthermore, the banking sector has proved resillient to crises whether internal or external. The local industry experienced turmoil in 2003 with the Sambou liquidity dilemma`s which threatened the reputation of the sector. Also the sharp depreciation of the rand had adverse effects for the banking industry and the credit crunch that quickly spread across the world and reaked havoc in many financial hubs, shaking many banking sectors to the core. Here the South African banking sector proved resillient and survived because of the strong foundation that the sector is built upon.

The foundation of the South African banking system is based on the 'four pillar policy", whose chief motive relates to the safeguarding of minimum levels of competition, in the interests of prudential and systemic stability. This is predicted to avoid the spread of risk and to support reliance on a broader platform of institutions (Mboweni, 2004). This policy is not unique to South Africa, it is a policy that many banking sectors are premised on. It was first used in Australia when its government discouraged mergers between the four major banks and the two main life insurance companies. The Australian government determined that it would be anti-competitive for the four big banks and two big insurance companies to merge. A similar resolution was passed in South Africa when Nedcor bid for a stake in Stanbic, thereby manifesting the four pillar policy.

3.5 FINANCIAL LIBERALIZATION REFORMS

This section aims to analyse the changes that occurred in the South African financial sysytem with regard to reform. A description of how the reforms transformed the sector from a repressed sector to a liberal financial and banking sector in South Africa today. This analysis of the dates that are pertinent to financial liberalisation are a combination of the dates used by Casteleign (2001), Loots (2002) and Stals (1997). There are compiled with a view to achieving finacial liberalization as espoused by McKinnon and Shaw (1973) and later summarized by Seriuex (2008) as:

a) Market-determined interest rates;

b) Greater ease of entry into the banking sector to encourage competition;

c) The elimination of directed credit programmes;

d) Reduced fiscal dependence of the state on credit from the banking system (to allow for greater expansion of credit to the private sector).

3.5.1 Market determined Interest rate

In South Africa the interest rate is important because it affects many individuals as mortgage loans accounted for the largest share of total loans and advances, followed by overdrafts and other loans. Thus the interest rate policy is a key determinant in the housing market and other important business decisions. In line with this recent data, theory placed much relevance on interest rates, as the cornerstone of the MS framework argument. Where a repressed financial sector is typified by stringent controls on interest rates. In light of this, South Africa was 'extremely financially repressed' during the period spanning 1960 to 1981. As Casterleign (2001) puts forward, that South Africa had in place a liquid asset ratio-based system with quantitative controls over interest rates and credit. Within this framework interest rates had a limited role as an instrument of monetary policy. Other repressive measures such as liquid asset requirements and cash reserve requirements were the mainstay of monetary policy stance towards banks. The liquid asset requirement required banks to invest in the SARB prescribed liquid assets as a proportion of deposits such as SARB notes, coin, gold coin, teasury bills, government stock and trade bills (Casterleign, 2001).

The liquid asset prescription was put in order to finance those sectors that financed the liquid assets at low interest rates. These lower interest rates were not market related and as such stimulated allocation effects (Casterleign, 2001). In other words the low interest rates advanced to the preffered sectors represented sub-market interset rates and the allocation problems that ensued inadvertedly resulted in credit rationing that further provided financing to the favoured sectors while starving the rest of the market as the MS hypothesis predicts

This was the general situation that prevailed in South Africa between 1960 and 1981 with regard to interest rates. However, macroeconmic turmoil prompted an impulse with the set up of the De Kock dommission to evaluate monetary policy (Strydom, 2000). The final recommendation of the de Kock commision was released in 1985. And one of the main recommendations was that South Africa moves away from the direct controls to more market oriented economic policies. As such the 1980`s saw a gradual implementation of the recommendations of the De Kock commission. Stydom (2000:3) chronicles that financial reforms allowed interest rates to

follow market signals and from 1980 onwards interest rates adjusted upward, signalling a break from the rigid control systems of the 1970s with its bias towards low non market interest rates.

3.5.2 Greater ease of entry into the banking sector to encourage competition

The removal of direct controls on capital movements ushered in an era of new entrants into the banking and financial sector. A number of foreign banks set up offices and subsidiaries in the local market. While local banks also launched their operations in foreign countries(van de Merwe). This had an effect of reducing the intensity of barriers to entry into the financial sector. Moreover, as communicated by Stals (1997) this type of liberalisation brought about increased competition for the domestic banks in South Africa, but they became more exposed to the vicissitudes of volatile international capital movements.

However, it is important to note that in the banking industry not all barrieers to entry have been entirely eliminated. Since the costs of entry into the corporate and retail market are not the same. The costs of entering the corporate sector are markedly lower than retail sector resulting in much of the foreign investment in the banking sector being directed to corporate banking, which has increased the level of choice and countervailing power in this sector. Conversely the absence of such competition in the retail market which is dominated by five main banks viz; ABSA, FNB, Investec, Nedbank and Standard Bank has a negative effect on competition (Okeahalam,2001). Thus, the cost efficiency can be prudently assumed as being sub optimal. In this case there is still greater room for financial liberalisation in terms of further reducing barriers to entry into the financial sector particulary the banking sector.

The banking sector in South Africa still exhibits traits of a financially repressed system. One of the key indicators of such a system is an oligopolostic banking system that has stringent entry barriers.

3.5.3 Reduced fiscal dependence of the state on credit from the banking system.

The case of the SouthAfrican government benefitting from a fiancially repressed environment is not as easy to pick out, as the situation decsribed by Giovannini and de Melo (1993). In this article Giovannini and de Melo (1993), describe situations where governments have gained financially by maintaining repressive financial regimes through inflation tax, seignorage and directed credit programmes. However, there was an element of fiscal dependence for South Africa on some of the policies undertaken with regard to taxes and other revenues.

The South African government instituted the financial rand in 1985, which was used exclusively for the movement of of nonresident capital. The two-tiered currency system protected the country's foreign currency reserves from politically motivated capital flight, because all divestment by nonresidents was automatically met by new investment.Evidently the government benefitted in this way. It was able to quickly reinvest through use of the financial rand, thus the adverse effects of rapid capital reversals "hot money" had minimal negative impact on the South African economy. The price of the financial rand varied independently of the commercial rand. The financial rand traded at a discount to the commercial rand thus attracting foreign investors to invest in the financial assets for less than the rates of commercial rand. Effectively the government was able to raise money for the bond market in this way and effectively insulate the economy as a fixed stock of rand denominated foreign capital invested in South Africa was traded amongst foreigners. Thereby insulation the South African balance of payments from foreigners demand for rand denominated securities (Garner, 2006:134). The abolition of the financial rand in May of 1995 was a significant step towards financial liberalisation (Loots, 2002).

3.5.4 Other

The stock market has become an integral part of the economy as it is a place were companies are able to raise funds for long term projects while offering investment opportunites and a market that allows them to quickly liquidate their holdings. Moreover, the bourse can be used as a barometer of economic activity. As such The Johannesburg Securities exchange (JSE) has generally fulfilled its mandate. There has been an average of ten new initial public offerings (IPO`s) in the past five years (Leffi, 2010).

In terms of reforms of the stock market, there has been much deregualtion particularly through the formation and legislation of Alt-X. The caps on ownership structures have been generally all but removed except with regard to the movement of money outside the country in line with the exchange control act. The reforms that took place on the JSE were due to concentration, thin trading, sindle capacity trading, illiquidity and high ownersip concentrtaion. The reforms widely termed the 'The Big Bang' that were initiated to counter the aforementioned problems include: dismantling exchange controls, automated trading system of 1996 and dual capcity trading (Mknize and Mbanga, 2006).

3.5.5 Comparison of financial liberlization progress with peers

The reforms of South Africa are compared below with those of SADC peers. We can see that South Africa is among the countries with the least regulations in SADC. Zambia and Botswana exhibit the most liberal financial markets as regulations that constitute a liberal market are all present. On the other hand repressed financial markets seem to be in Angola aand Zimbabwe.

Table 1: Check list of financail liberalization in SADC

	State ownership of commercial banks	Foreign ownership of banks prohibited	Regulation of interest rates	Fixed exchange rate	Government intervention in the allocation of credit	Exchange controls on the current account	Exchange controls on the capital account
Angola	✓	x	n.a	✓	✓	✓	✓
Botswana	x	x	X	x	x	x	x
Lesotho	✓	x	X	x	x	x	✓
Malawi	✓	x	X	x	x	x	✓
Mauritius	x	x	X	x	x	x	✓
Mozambique	x	x	X	x	✓	✓	x
Namibia	x	x	X	x	x	x	✓
South Africa	x	x	X	x	x	x	✓
Swaziland	✓	x	X	x	x	x	✓
Tanzania	✓	x	X	x	x	x	✓
Zambia	x	x	X	x	x	x	x
Zimbabwe	✓	x	X	✓	x	x	✓

Source : Economist Intelligence Unit; SADC Central Bank Governors

3.6 SYNOPSIS

This chapter sets out a brief snapshot of the South African economy, which is the largest in Africa. Its growth trend has not been an absolute upward trend but an upward trend riddled with volatility as shown in figure 1. This is followed by an assessment of the savings, investment nexus which shows a strong correlation for South Africa. And then the components of the nexus are examined seperately. The gross national savings for South Africa show a general downward spiral which signals general dissaving of the South African populace. Investment on the other hand is seen as generally trending upwards especially after 1995. However, the investment as a proportion of GDP shows a marked decline.Interest rates are consisitent with litearature as they show an upward trend after measures to financially liberalize in 1980. There is also a brief overview of the South African banking sector, which is shown to be comprised of many banks yet a few dominate the market. These oligopolistic tendencies show that there is still room for more liberalisation in the banking sector that could lead to optimal results for the economy.

In the second part of the chapter, there is an overview of the reforms that took place in the move towards financial liberalisation. These are examined from the viewpoint of the MS framework. Beginning with the transformation from repressive monetary controls to market determined interest rates as a main tool for monetary policy. Secondly an analysis of the relaxation of legislation now allowing more banks to enter the market and or set up repesentative offces and subsidiaries. Lastly, the reduced fiscal dependence on the banking system is slightly expanded to include the whole financial market. South Africa benefitted immensely from the fiancial rand that insulated the country`s balance of payments. As the country was somewhat immune to capital outflows and was consequently not adversely affected by large portfolio reversals as the finacial rand enabled authorities to quickly replace the withdrawn capital.

CHAPTER FOUR:

METHODOLOGY AND DATA DESCRIPTION

4.1 INTRODUCTION

The research's primary objective seeks to ascertain the degree to which the theoretical precepts of the MS hypothesis are manifest in the South African economy. In order to empirically examine these precepts, it is important to discuss the variable selection, model specification and estimation methods to be used in the study. The model specification criterion is presented and the proxies for the variables chosen are motivated. A description of the various econometric techniques to be used is proffered. The Johansen test for cointegration is explained. And since the presence of cointegrating relationships has implications for the way in which causality occurs, causality tests are also carried out. Using the Principal component analysis method, an index for financial liberalization is generated. This method takes into consideration the partial or phase-wise manner in which financial liberalization reforms are implemented.

4.2 MODEL SPECIFICATION

4.2.1 Variable selection

The MS hypothesis is clear on the variables that are pertinent to internal financial liberalisation. These are the interest rates, savings rates, and investment and growth rates. The precepts of theoretical MS literature dictate that higher real interest rates as an outcome of financial liberalisation bring about higher savings and consequently increased investment which in turn leads to higher economic growth. The path to economic growth from financial liberalization passes through financial development. This chain of events has been asserted by various authors (Robinson, 1952; Khan and Senhadji, 2000; Aziakpono, 2001; Chaudry, 2006). Consequently financial development indicators have been used to proxy financial liberalization.

Other variables that are used in the empirics of literature to proxy financial liberalization include the dependent variable of GDP. The independent variables used in the study are widely accepted in literature as proxies of financial development (Chaudry, 2006; Tswamuno *et al*, 2007; Adams, 2007); Ang and Mckibbin, 2007). This study recognizes the vast impediments of controlling for all non- financial liberalization related causes of growth in the dynamic South African economy.

Therefore, the behaviour of liberalization proxies is followed over time and a number of control variables are also included. The variables will be used in logarithm form since logarithms increase the sensitivity of the data and many theoretical calculations work more cleanly with the use of logarithms.

The proxies to be used are; claims of all banking institutions to the private sector i.e. the total credit extended to the private sector (DCE). This variable measures and controls for bank sector development. Most authors use the broad money aggregate i.e. M2 to GDP ratio, which measures the depth of the financial sector or the level of monetization in the economy (Lynch, 1996:7; Aziakpono, 2001 and Chaudry, 2006). However, the claims of banking institutions on the private sector are a better financial development indicator given the financial liberalization backdrop as espoused in Tswamuno *et al* (2007) that this variable proffers further insight into financial liberalization effects. Moreover a significant share of bank loans made to the South African private sector is owned by foreign lenders. This highlights the level relaxation of capital account (Chowdhury and Shrethra, 2007). *A priori,* as claims to the private sector increase a positive impact on investment is expected thereby stimulating economic growth. The model also includes the interest rate (INTR), as it plays an integral part in the MS hypothesis and is an important financial liberalization variable (Chowdhury and Shrethra, 2006). The interest rate is proxied by the prime overdraft rate since it is the rate that is advanced to most economic participants. This proxy is valid given the assumption that banks will aim to maintain a consistent margin hence an increase in prime overdraft rate will also increase the deposit rates. Savers are thus attracted to higher deposit rates.

The level of stock market turnover ratio is viewed as the proxy for stock market liquidity. Stock market turnover (JSETURN) is expected to have a positive relationship with economic growth (Levine and Zervos, 1998). In the absence of adequate liquidity, less investment takes place in high return projects that need long-run commitments of capital. JSETURN shows the extent of which resources are being used to improve stock market liquidity and risk diversification and as such an expected positive relationship with GDP and investment. It is obtained as natural log of the ratio of value of listed shares to real GDP. Furthermore, the level of government spending affects the economy and the government debt as a percentage of GDP is used to ascertain the effects of the level of government debt on the economic growth. (Chu, 2007).

There are various control variables that are used in this study. Chaudry (2006) uses a general globalization proxy of trade openness (TOP) and is calculated as the sum of total real imports and exports over GDP and a priori a positive relationship is expected with economic growth. Other control variables that may be very pertinent to South Africa are the health variable (HEALTH). This is pertinent to the study given that population health is integral to overall economic activity. South Africa's productivity may be impeded by the prevalence of the HIV/AIDS (McDonald and Roberts, 2004). In this regard the study uses the total spending on household health services which is important as decisions on labour force participation are taken at the household level (Son, 2003). The savings rate, (SAVINGS) is also included in the model. The savings are taken as the gross national savings as a percentage of GDP .The rise in savings rate given a relatively efficient intermediation process is expected to lead to a rise in the investment which consequently feeds into increased economic growth. Therefore, the investment rate (INV) is included in the model and is proxied by gross capital formation expressed as a percentage of GDP.

The equations are split into four to cater for the various ways to measure financial development i.e. M2/GDP, JSETURN/GDP and DCE/GDP. A financial liberalization index FLIBINDEX is constructed and this measure caters for phase wise domestic legal reforms in the financial sector. The models can be presented as:

MODEL1: LGDP1 =f (FINLIBINDEX, FD, INTR)

MODEL2: LGDP1 =f (FILIBINDEX, LDCE, INTR)

MODEL3: LGDP1 =f (FLIBINDEX, LM2, INTR)

MODEL4: LGDP1 =f (FLIBINDEX, LJSETURN, INTR)

Summary of Expected Signs of the Coefficients in the General Model

Variable	Theory intuition	Expected sign in relation to GDP
FD	Financial development generally improves the intermediary effects of financial institutions and this generally leads to increased quality investments that increase economic activity	**(+)**
FLIBINDEX	Financial liberalization has a positive effect on economic growth as it allows the market to function efficiently without government and statutory hindrances.	**(+)**
INTR	High cost of borrowing deters borrowing, thus less investment and economic activity.	**(-)**
M2/GDP	The higher the financial deepening and increased money in the economy should lead to increased economic activity.	**(-)**
JSETURN/GDP	A high stock market turnover signifies a vibrant economy that has shares changing hands as a sign of positive sentient held in many sectors. And increased ability to raise funds, thus a positive relationship with GDP	**(+)**
DCE/GDP	Domestic credit to private companies is a better than to public sector thus it shows productive use of funds linked to greater economic growth.	**(+)**

Control Variables

Variable	Theory intuition	Expected sign in relation to GDP
CPI	Inflation will cause production to decrease since goods are produced at higher prices	**(-)**
INV	Gross domestic investment is linked to economic growth as investments in fixed capital improve efficiency of factors of capital invested.	**(+)**
TOP	Openness is generally regarded as positive and as total trade increases economic growth rises	**(+)**
GVTDBT	High government debt usually crowds out the financial market. And is linked to less economic growth	**(-)**
HEALTH	An important human development control variable, as health increases the economy is set to gain from less absenteeism and increased productivity and efficiency.	**(+)**

4.3 ESTIMATION TECHNIQUES

A three step process shall underlie all the results unless otherwise specified. The three step process will begin by setting out all the descriptive statistics of the data set so as to ascertain its behaviour. Secondly, the testing for the existence of unit roots using the Augmented Dickey Fuller (ADF) test and KPSS stationarity test. Thirdly, tests for cointegration using the Johansen approach. It is important to note that in the event of a cointegrating relationship, causality tests of the Granger causality nature will be carried out as cointegrated relationships have implications for causality. Therefore, the methodology will highlight the methods to be utilised in order to realise the preliminary econometric validity of our data set, as such performing confirmatory data analysis (Brooks, 2002:382)

4.3.1 Unit root test

The analysis of econometric data and inferences made from time series regressions is based on the assertion that time series data is stationary (Bah and Amusa,2003). The stationarity of a time series may be tested through the use of a unit root test. In this case the more advanced and widely used in literature, ADF test is used. The ADF utilizes the equation:

$$\Delta y_t = c_1 + c_2 t + \omega y_{t-1} + \sum_{i=1}^{P} d_I \Delta y_{t-I} + v_t \qquad \text{.....(4.1)}$$

The null hypothesis is that there is a unit root in the time series, against the alternative hypothesis that the time series is stationary, represented as:

H_0: $\acute{\omega}=0$

$H_{1:}$ $\acute{\omega} <0$

This is a guide to determine the unit root; if the calculated statistic is less than the MacKinnon (1996) values then the null hypothesis is accepted. Thus there is a unit root in the series, i.e. not stationary. However, if it is greater than the MacKinnon statistic then we reject the null and therefore there is no unit root and the series is stationary. A major problem in unit root testing is the optimal number of lags of the dependent variable. There are two ways in which to determine the optimum number of lags. Firstly the frequency of the data may be used. For example, if the data is quarterly use 4 lags and if it is monthly use 12 lags and so on. Secondly, it is possible to use an information criterion such as the Schwartz information criterion (SIC).

The ADF has a major weakness which is its ability to detect a false null hypothesis. As such Nelson and Plosser (1982); Thomas (1997) put forward that this lack of power means that the ADF does not succeed in detecting stationarity when the series follows a stationary process. This could occur either because the null hypothesis was correct or because there is insufficient information in the sample to enable rejection. However, there are several ways to deal with this problem. Firstly, increasing the sample size and secondly the use of a stationarity test. The addition of sample size may however be restricted by data unavailability. While a stationarity test may be used without changing the data. Consequently Brooks (2002:382) suggests the use of a unit root test simultaneously with a stationarity test; we take a look at a stationarity test below.

4.3.2 The Kwiatkowski, Phillips, Schmidt and Shin (KPSS) test.

The KPSS procedures test the null that an observable time series is stationary around a deterministic trend against the alternative that it is non-stationary. It differs from the unit root tests since the time series is assumed to be trend-stationary in the null hypothesis (Kwiatkowski *et al*, 1992). The KPSS test is based on the residuals of the ordinary least squares. Its results have proved robust and consistent according to (Kwiatkowski *et al*, 1992) in testing the data against the Nelson and Plosser (1982) data set that confirmed ADF inconsistency.

4.3.3 Cointegration Analysis and vector error correction modeling (VECM)

Error correction and cointegration analyses have added much to time series analysis and as such further engraved the economic theory in explaining the relationship between economic variables. The forerunners to the VECM and cointegration analysis may be separated into two main sections where statisticians and econometricians used time series data in different ways. Firstly, assuming that the non stationarity of time series did not affect empirical analysis the econometricians utilised the classical linear regression model (CRL). The main problems to be dealt with in this regard were simultaneity and autocorrelation while little attention was given to the dynamics of the data such as spurious (nonsense) regressions resulting in flawed interpretation of the R^2, DW and t statistic (Granger and Newbold, 1974). Secondly, according to Kennedy (1998) time series analysts were inclined to avoid the dilemma of stationarity by differencing data as much as necessary to make it stationary. As the continual differencing is basically a representation of the dependent variables own past values as well as current and past errors therefore it is deemed atheoretical. These problems are adequately dealt with in the cointegration and vector error correction models described below.

Firstly, the Johansen cointegration procedure has been chosen over many other cointegration tests such as Engle and Granger, Stock and Watson (1988) test as it possesses several desirable properties. The Johansen cointegration procedure allows the identification of all cointegrating vectors in a set of variables if they exist. This is a marked distinction form the Engle and Granger approach that does not permit direct hypothesis testing on the cointegrating relationships (Brooks, 2002:407). Secondly, in the Johansen procedure all test variables are applied as endogenous variables and it possesses advanced asymptotic attributes that produce robust results. Furthermore, in this procedure after establishing the cointegrating relationships the VECM is estimated to cater for short run dynamics.

In selecting the appropriate procedure to use in cointegration analysis there are two main tests that may be used namely; the maximum likelihood estimation (VAR) and a residual based test. The residual tests are of the Engle and Granger form which is a single equation based technique that has a several weaknesses chief among them is lack of power in unit root tests, simultaneous equation bias, and inability to detect multiple cointegrating relationships. However, the Johansen and Juselius (1990) method incorporates maximum likelihood estimation based on VAR system. The Johansen procedure will therefore be used to test for the long run equilibrium relationships in the savings, investment, interest rate and economic growth nexus.

Cointegration is defined as a relationship between non stationary unit root processes. And the presence of a cointegrating relationship has the following economic intuition. If two series are cointegrated then even if both processes are non-stationary, there is some long run relationship linking the series that renders the relationship stationary (Escudero, 2000:12). Furthermore, if two variables integrated of the order one I (1) while the residuals obtained through regression of Y_t and X_t are I (0) this means these two series are cointegrated (Harrison 1995:52).

In the Johansen procedure, the hypothesis that is being tested is the null of non-cointegration and the alternative of cointegration, using Johansen's maximum likelihood method. This is done through the use of a vector auto-regression approach to model each variable as a function of lagged endogenous variables. To further explain this point Johansen (1988) proffers a hypothetical case where X_t is integrated of order one I (1) thus the first difference of X_t is stationary. The process X_t presented below is for an unrestricted VAR system of the order (n*1). Johansen (1988) presented the equation as;

$$X_t=\Pi_1 X_{t-1}+\Pi_2 X_{t-2}+\ldots\ldots+\Pi_k X_{t-k}+\mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.2)$$

Given that;

X_t= (n*1) vector of the I (1) variable;

Π_i= (n*n) the matrix of unknown parameters to be estimated (i=1,2,3….k);

μ_t = vector of error terms;

t = number of observations.

Now, suppose that the (change sign) = (I-L) where L is the lag operator of (4.1) that can be changed into the error correction form as shown below;

$$æX_t = \sum_{i=1}^{k=1} \Gamma_i \, æ X_{t-I} + \Pi \quad X_{t-k} + \mu_t \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.3)$$

Where ΔX_t is a stationary vector and I is an (n*n) matrix.

$$\Gamma_I = \sum_{i=1}^{k=1} \Pi_i - I, \; i=1, 2, 3 \ldots\ldots k-1 \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.4)$$

And

$$\Pi = \sum_{j=1}^{k} \Pi_j - I \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5)$$

The Vector Error Correction model is represented by equation (4.4). Furthermore the Johansen procedure develops maximum likelihood estimators of the cointegrating vectors for an autoregressive method with independent errors. The ($n \times n$) matrix Π may be presented as the result of α and β, two ($n \times r$) matrices each of rank r, such that Π=βα', where α contains the r cointegrating vectors and β represents the matrix of weighting elements. Thus, the equation above is changed to

$$\Delta X_t = \sum_{i=1}^{k-1} \Gamma_I \, \Delta X_{t-I} + (\beta\alpha) X_{t-k} + \mu_t$$

In the Johansen procedure the maximum likelihood method facilitates hypothesis testing of r cointegrating relations among the elements of X_t.

H_0: Π=βα',

Where the null is no cointegrating relations (r=0) means Π=0. Therefore, the test for cointegration is whether eigenvalues of the estimated Π are different from 0. In such a method there are tests for the number of cointegrating relations, where $0 \leqslant r < n$. If there is no cointegrating relationship, there is no linear combination of $nI(1)$ variables is stationary.

4.3.4 Impulse response.

Impulse response analysis measures the time profile of the effect of a shock, or impulse, on the future values of a variable**.** According to Brooks (2002:341) a unit shock is applied to the error term for each variable in each equation separately and the effects on the VAR system are observed over time. In so doing, the shocks can be attributed an economic meaning. For example in this study the impulse response analysis shows the sign, magnitude and persistence of the savings, interest rate and investment nexus shocks to financial liberalization. Furthermore, Naka and Tufte (1997) assert that a shock to a variable in a VAR does not only directly affect that variable, but is passed on to all other endogenous variables within the system because of the dynamic structure of the VAR.

4.3.5 Variance decomposition.

There is vast information that can be obtained through variance decomposition analysis about the savings, interest rate and investment nexus. The analysis of variance decomposition conducted on the VECM may offer information on the significance of shocks to the determinants of the financial liberalization in explaining variations in the nexus under study. Variance decomposition analysis may also be termed error variance decomposition analysis, which exhibits the level of the forecast error variance in one variable that is due to errors in forecasting itself and other variables in the VAR model (Alami, 2001:121). However, research (Alami, (2001): Brooks, (2002) and Lutkepohl (2007)) has shown that a shock of the series itself explains the error variance of a series in a VAR.

4.4 PRINCIPAL COMPONENT ANALYSIS

Principal component analysis (PCA) is considered the mainstay of modern data analysis. PCA offers a roadmap of how to condense a complex data set to a lower dimension to expose the sometimes hidden, simplified structures that often underlie it (Shlens, 2005). In this study PCA will be used to construct a financial liberalization index (FLI). The construction of the index will

explicitly follow the work of Adams (2007): Chowdhury and Shrethra (2006) as it avoids losing full information on domestic financial liberalization.

A principal component is defined as a linear combination of optimally weighted observed variables. Thus, the weights of the individual financial reforms will enable calculation of the principal component. The following is the general form of principal component analysis:

$$C1 = b\ 11(\chi 1) + b12\ (\chi 2) + \ldots\ b1p\ (\chi p) \qquad (4.6)$$

Given that;

C1= a subject score on the first principal component extracted,

b1p = the regression coefficient (or weight) for observed variable p, as used in creating principal component 1.

χ p = the subject's score on observed variable p.

The above is a mere explanation of how the principal component is attained. The full PCA procedure may be summarized as follows:

1.) Initial Extraction of the Components
2.) Determining the Number of "Meaningful" Components to Retain
3.) Rotation to a Final Solution
4.) Interpreting the Rotated Solution

The number of components extracted is equal to the number of variables under study. The first component can be expected to account for a large amount of total variance and each succeeding component will account for progressively smaller amounts of variance. In this way only few components will be important enough to be retained for interpretation. The principal component is obtained from reading from the *Eigenvalues of the correlation matrix*. An eigenvalue signifies the level of the total variance that is explained by a given component.

Secondly, there are several criteria that mandate how many components are truly useful to the study and should be retained for interpretation. The methods of selection that may be used for the purposes are; the eigenvalue-one criterion, the screen test, proportion of variance accounted for and the interpretability criteria. The criterion that this study follows is the interpretability criteria. This method is appropriate for the study as it interprets the substantive meaning of the retained components and verifying that this interpretation is prudent with regard to the constructs under investigation (Kim and Mueller, 1978). Steps three and four involve rotating the solution i.e. basically ensuring that the results meet the interpretability criteria.

In the construction of the financial liberalization index, an arbitrary value is given to each financial policy variable. The policy variables may take a value that is between 0 and 1 based on their degree of implementation in South Africa. If the sector is fully liberalized then the policy variable will have a value of 1, while a fully regulated sector takes on the value of 0. The index also sets out to capture partial and phase-wise financial liberalization as espoused in the various liberalization measures. For this purpose and in line with Chowdhury and Shrestha (2006), partial values 0.33, 0.5 and 0.66 have been used. A value of 0.50 shows the first phase of partial deregulation in a two-phased deregulation process, whereas a value 0.33 and 0.66 indicate the first and second phase, respectively, in a three-phased deregulation process.

A description of the policy variables used in the creation of the financial liberalization index and their dates of implementation are shown below;

- Interest rate deregulation- 1960 -1981 there is a system with controls over interest rates and credit. Full implementation of deregulated interest rates in 1985.
- Reduction in reserve requirements- the cost of cash reserves-based monetary system came into operation by the middle of 1985 (Casterleign, 2001).
- Removal of entry barriers to the banking sector- more banks entered the banking sector in the early 1990`s. However; a largely oligopolistic market structure exists in the banking sector. Only large players exist in the market, thus they are able to collude in price setting thus stifling competition (Ntingi, 2010). Full liberalization in terms of the entry barriers should include the unhindered entrance of second tier banks into the sector.

- Stock market reform- according to Mkhize and Mbanga (2006). The "Big Bang" on the JSE instituted a number of reforms that set to liberalize and bring the JSE in line with international standards.

- External account liberalization- most restrictions on non-residents were removed. Although several were still in place between 1997 and 1998. As such they helped to limit the contagion from the Asian financial crisis (Shogo, 2002).

- Abolition of financial rand- was not done in phases but an outright abolition in 1996 (Loots, 2002).

- Limits on investment abroad- many regulations regarding outside investment seem restrictive. However, the practical effect of the liberalisation policy in respect of Exchange Control being progressively implemented by the government is that a very wide range of transactions can be sanctioned by the Authorized Dealers themselves. To this extent this segment of the financial sector is relatively 'liberal'.

4.5 SYNOPSIS

This chapter describes the variable selection and definitions of the determinants of economic growth and investment to South Africa. The model determinants are added under the MS assertion that financial liberalization will lead to higher investments and consequently economic growth. The estimation techniques utilized in the study namely: Johansen Cointegration, VECM framework are presented. This is followed by the discussion of impulse response and variance decomposition analysis. To conclude the chapter there is a description of the principal component analysis (PCA) which is used to construct a financial liberalization index. The following chapter presents the actual estimation results of how well the MS hypothesis is manifest in the South African data as well as a financial liberalization index using the above mentioned techniques.

CHAPTER 5: ESTIMATIONS AND RESULTS ANALYSIS.

5.1 INTRODUCTION

The preceding chapter presented the analytical framework and the econometric techniques that will be utilized in addressing the objectives of this study. The current chapter now applies these econometric techniques to the data in order to address the objectives. This chapter is divided into seven sections. Section 5.2 looks at the generated financial development and financial liberalization indices. Section 5.3 provides graphical analysis and unit root tests of the series using the Augmented Dickey-Fuller and KPSS tests. Section 5.4 focuses on the cointegration analysis using the Johansen (1988) and Johansen and Juselius (1990) maximum likelihood method. This econometric procedure will be used to ascertain the existence of stable long and short run relationships between various economic variables. Weak exogeneity tests and diagnostic tests are also discussed in this section. The interpretations of the short and long run parameters are also proffered in this section. Additionally, the control variables are used to assess the robustness of the initial results. Furthermore, since the existence of cointegrating relationships has implications for causality, Granger causality tests are carried out and discussed. The results that will be obtained in this chapter will aid in answering the questions that were set out in chapter 1 of this study.

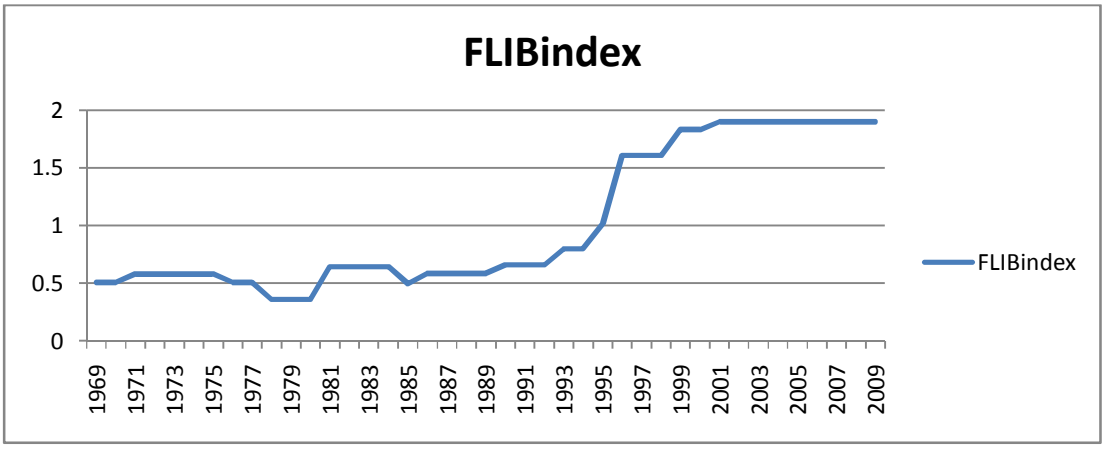
5.2 GENERATING THE INDICES

5.2.1 Financial liberalization index

The financial liberalization index was prepared based on five reforms namely: interest rates, the entry barriers to banking sector, stock market reform, exchange controls and external account liberalization. The phase wise fashion in which reforms takes place is accounted for as each measure may be assigned a value between 0 and 1 depending on level of liberalization. 0 represents an extremely repressed sector while 1 signifies fully liberalized. The values assigned to each reform are shown in Appendix. A principal component analysis of the values is then conducted. The first two principal components accounting for 87% of the variation are used. Each reform is multiplied by the value of the principal component and they are added up to generate the index, in a similar manner to Chowdhury and Shrethra (2007) for a financial

liberalization index for Nepal. The figure representing the generated trend in financial liberalization is given in figure 5.1.

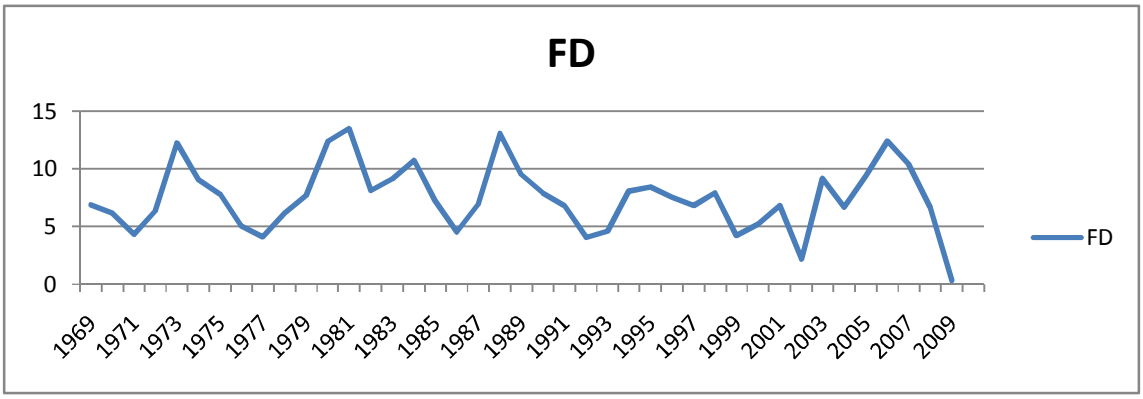
Figure 5.1: Generated Financial liberalization index for South Africa



5.2.2 Financial development Index

Since financial development is important in understanding the dynamics between financial liberalization and economic growth. The financial development index is created in line with the studies by Ang and McKibbin (2007). The index takes into account the various measures that may measure financial development. It uses the broad money aggregate (M2 to GDP), stock market turnover to GDP and total credit extended to the private sector as a percentage of GDP. The trend shown in the financial development indicator is shown in figure 5.2. It shows that the level of financial development has been volatile but exhibits a mean reverting behavior. Although the financial development index falls drastically around the time of the global financial crisis, this could be an indication of the financial sector`s ability to self-correct.

Figure 5.2: Generated financial development index



5.3 UNIT ROOT TESTS

It is important in the use of the Johansen procedure and any other econometric procedure to check the behavioral traits of the time series data. For the purposes of cointegration it is required that the series be non-stationary at level i.e. have a unit root. This study makes use of one informal test i.e. a graphical analysis and it employs two formal tests namely the ADF and KPSS tests. Visual plots of the data set are usually the preliminary step in the unit root analysis as it allows for the exposure of any data capturing errors and gives ideas as to the stationarity and trends present in the data set.

The graphical plots in figure 5.1 show that FD, FLIBINDEX, LDCE LHEALTH and LJSETURN are trending upward over time while LSAVINGS exhibit a distinct downward trend. LCLAIMSGDP show a general decline over time and LINTR seems to be on a generally upward spiral from 1980 which augurs well with the MS framework. While LINV shows a progressive fall from the 1980`s to about 1995 thereafter an upward trajectory is observed. LGVTDBT and LTOP seem not to have a distinct movement up or down but show signs of volatility, but LTOP trends upwards from the mid 1990`s and a sharp fall in the earlier from 2005. Lastly, LM2 shows no particular trend but interestingly it seems to dip and rise in unison with LGDP1. The statistical inferences that can be derived from the visual plots are limited therefore we proceed to the formal tests of the ADF and KPSS.

Figure 5.3: Graphical plots of time series

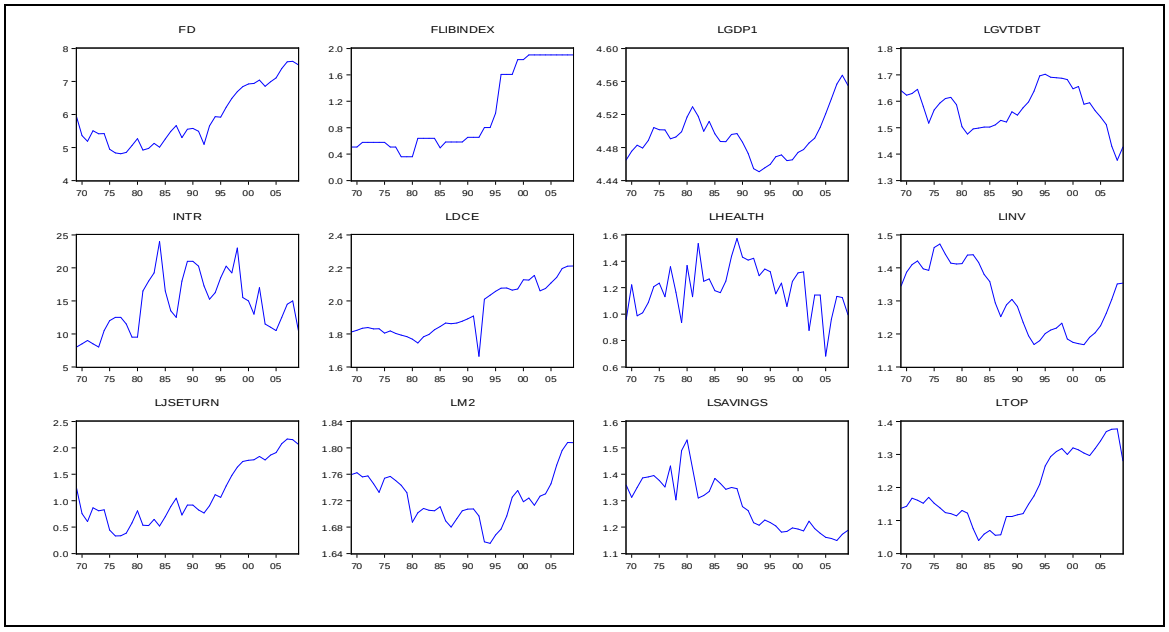


Figure 5.4 Stationarity Results

Variable	ADF Level	KPSS level	ADF 1ST Difference	KPSS 1st Difference	Order of Integration
FD	-0.15 (0.966)	1.025	-6.67 (0.000)	0.056	I (1)
FLIBINDEX	-0.03 (0.950)	1.199	-5.43 (0.000)	0.186	I (1)
INTR	-2.51 (0.122)	1.216	-5.59 (0.000)	0.144	I (1)
LCPI	1.30 (0.999)	0.699	-3.98 (0.002)	0.021	
LDCE	-0.29 (0.918)	0.366	-9.35 (0.000)	0.028	I (1)
LGDP1	-1.61 (0.467)	0.168	-3.89 (0.004)	0.352	I (1)
LGVTDBT	-1.70 (0.422)	0.645	-4.47 (0.005)	0.161	I (1)
LHEALTH	-0.42 (0.524)	0.920	-10.33 (0.000)	0.280	I (1)
LINV	-1.65 (0.449)	1.260	-3.91 (0.000)	0.025	I (1)
LJSETURN	0.58 (0.838)	1.160	-6.50 (0.000)	0.040	I (1)
LM2	-1.31 (0.614)		-5.59 (0.000)	0.053	I (1)
LSAVINGS	-1.56 (0.492)	1.375	-4.94 (0.002)	0.035	I (1)
LTOP	-1.34 (0.602)	1.610	-3.19 (0.002)	0.250	I (1)

Notes: p-values are in parenthesis.
Source: Thompson Datastream (2009), South African Reserve Bank and author's own estimates using E-views 6. The MacKinnon (1996) 1 % critical value is -3.485 and the KPSS 1% critical value is 0.739.

5.3 ANALYSIS OF LONG RUN RELATIONSHIPS AND SHORT RUN DYNAMICS

5.3.1 Cointegration Analysis

Stationarity tests showed that all the data is integrated of order one I (1), the next step is to test for the long run relationship between the variables. The starting point in Johansen cointegration analysis test requires the estimation of a VAR equation. Four VARs are estimated and the models aim to evaluate the existence of stable long run relationships between economic growth, financial liberalization, financial development and interest rates. The various models seek to test the extent to which financial liberalization is related to economic growth through financial development in its amalgamated form, and when different proxies are used for financial development i.e. domestic credit extended to the private sector, M2 to GDP and JSE turnover.

The robustness of the results are evaluated by adding several control variables to see if our cointegration results hold in a more dynamic model. The control variables include Savings, Trade openness, CPI, government debt and health expenditure. Furthermore, dummy variables are added to cater for major events since 1969 that may shift the outcome. The dummies are as follows: DUM1=South Africa`s independence in 1994, DUM2=Asian Financial crisis 1997-1998, DUM3=Global financial crisis, DUM4=1970`s oil crisis and DUM5=2001 -2002 financial crisis. The four main equations are presented as;

MODEL1: LGDP=f (FINLIBINDEX, FD, INTR)

MODEL2: LGDP=f (FILIBINDEX, LDCE, INTR)

MODEL3: LGDP =f (FLIBINDEX, LM2, INTR)

MODEL4: LGDP=f (FLIBINDEX, LJSETURN, INTR)

There is need to determine the optimum lag length in the use of the Johansen procedure that ensures that residuals are not serially correlated. Secondly, it is important to choose the appropriate deterministic trend assumptions for the estimation of the Johansen model. Johansen test statistics are very sensitive to lags used. In this study information criteria are used to determine the lags. However, the use of only one information criterion may prove to be misleading therefore a number of information criteria are used. It is also important to note that different information criteria may chose varying VAR orders. In light of this, information criteria are used as a starting point. The range of lags has been selected by the various information criteria and then tested for cointegration sequentially starting from smallest lag until results that are not serially correlated are obtained. The lag length selections are shown in Table 5.2 and as can be seen, different information criteria chose varying lags.

Table 5.2 Lag length Selection

Lag Criteria	Model 1	Model 2	Model 3	Model 4
LR	3	3	4	3
FPE	1	4	4	1
AIC	4	4	4	4
SC	1	1	1	2
HQ	1	3	4	1

Notes:

LR modified sequential LR test statistic (each at 5% level)

FPE Final prediction error

AIC Akaike Information Criterion

SC Schwarz Criterion

HQ Hannan Quinn Information Criterion

The results of cointegration of the four models are presented in table 5.3 and these results were subsequently tested for serial correlation. For models 1 and 2 lag order 3 under deterministic assumption 3 proffered the most meaningful results whilst models 3 and 4 used lag order 4 under deterministic assumption 3.

Table 5.3: Johansen Cointegration Test

				TRACE			MAX		
	OBS	K	A	r<0	r<1	r<2	r<0	r<1	r<2
Model 1.	41	3	3	98.925(0.00)	37.029 (0.01)	10.418(0.24)	62.135(0.00)	26.371(0.01)	6.409(0.56)
Model 2.	41	3	3	89.318(0.00)	27.820(0.08)	7.537(0.52)	61.498(0.00)	20.283(0.07)	6.099(0.60)
Model 3.	41	4	3	79.280(0.00)	37.984(0.01)	8.103(0.45)	41.295(0.00)	29.881(0.00)	4.261(0.83)
Model 4.	41	4	3	94.8450(0.00)	31.366(0.03)	12.438(0.14)	63.484(0.00)	18.927(0.10)	8.123(0.37)

Notes: Obs is the number of observations in the model, k represents the chosen lag length, and A is the cointegration assumption used. P-values are in parenthesis.

Source: Thompson DataStream (2009), South African Reserve Bank (2010) and author's own estimates using E-views 6

In models 1, 3 and 4, the trace statistics identified two cointegrating vectors while the maximum eigenvalue identified two cointegrating vectors in models 1 and 3. The maximum eigenvalue identified one cointegrating vector in model 4 while both the trace and maximum eigenvalue identified only one cointegrating vector for model 2.

5.3.2 Weak Exogeneity Tests

The next step after identifying the cointegating vectors is to estimate the VECM, where the estimation of VECM mandates normalizing on truly endogeneous variables. Therefore, weak exogeneity tests were carried out in order to distinguish between the endogeneous and exogeneous variables and reported in Table 5.4. In light of the fact that our objective is to ascertain whether financial liberalization has an effect on economic growth through the financial development route, the main concern is whether economic growth is truly endogeneous.

The endogeneity of GDP was explored by carrying out the weak exogeneity test. The null hypothesis that GDP is weakly exogenous is tested by placing a zero restriction on the α coefficient of GDP and running the models. The null hypothesis is rejected in models 1, 3 and 4 at a 1% level of significance. While model 2 showed GDP to be weakly exogeneous as the null is rejected at 6% level. This model identifies financial liberalization index as the endogeneous variable at 1% level. However, the general picture painted by the models is that GDP is indeed the truly endogenous variable. Furthermore, the explanatory variables were also tested to check whether they are weakly exogeneous. Model 3 and 4 suggest that Interest rates and Financial Development are endogeneous because they reject the null hypothesis of weak exogeneity at 5% level of significance. The summary of the weak exogeneity tests are summarized in table 5.4.

Table 5.4 Weak Exogeneity Tests

	Financial Dev. Variable Used	FD	FLINDEX	GDP	INTR
Model 1.	FD-Index	0.061 (0.80)	0.840 (0.36)	19.463 (0.00)	0.159 (0.69)
Model 2.	(DCE)	0.212 (0.65)	28.663 (0.00)	3.846 (0.06)	0.069 (0.79)
Model 3.	(M2)	1.270 (0.27)	0.032 (0.89)	11.351 (0.00)	10.736 (0.00)
Model 4.	(JSETURN)	4.023 (0.04)	6.273 (0.06)	12.293 (0.00)	1.084 (0.28)

Source: Thompson DataStream (2009), South African Reserve Bank (2010) and Authors' own estimates Eviews 6. P-values are in parenthesis.

5.3.3 Vector error Correction Models

The VECM models were estimated by normalizing on truly endogeneous variables in each of the models. The results are reported in Table 5.5. In model 1, financial development and interest rates are found to be negatively related to economic growth while the result suggests that financial liberalization has positive and significant long run relationship with economic growth. Thus in this model, a one point increase in financial liberalization will lead to 0.227% increase in economic growth. This result is meaningful as increased financial liberalization can be linked to economic growth via MS hypothesis which proposes that a major component of domestic financial liberalization is interest rate liberalization (McKinnon, 1973). The interest rate result is also intuitively appealing because we would expect increases in interest rates to retard economic growth because of their adverse effect on borrowing and current consumption. The dummy variables in the model show that dummy 4, the 1970`s oil crisis was significant and thus had a significant effect on the model outcome. This result is economically meaningful as South Africa set up the De Kock commission in the wake of the world oil crisis. Furthermore, according to (SADET, 2004:543) South Africa was in a debilitating economic recession by 1976. As such measures to protect and grow the economy were put in place. Financial liberalization and financial development may have been affected immensely during this period as this period coincides with the introduction of the financial rand and changes in the interest rate regime (Casterleign, 2001).

In model 2, the endogeneous variables are economic growth and the financial liberalization index. The results normalized on financial liberalization index show that financial liberalization is positively related to financial development and economic growth but negatively with interest rates. This result is insightful as it reinforces the a priori expectation of a long run relationship between economic growth, financial development and financial liberalization (McKinnon, 1973).

The results suggest that financial liberalization has a positive long run relationship with financial development; this is in line with much of the literature as liberalizing the financial sector allows financial deepening and competition thus the availability of high quality loans (McKinnon, 1973; Galbis, 1995). Two dummy variables were significant in this model namely dummy1 and dummy 4 which are for democracy and 1970`s oil crisis respectively. The democracy dummy was highly significant implying that democracy considerably affected the outcome of this model.

Furthermore in model 2, for the cointegrating equation normalized on GDP, we find that the interest rates and the financial liberalization index possess a positive long run relationship with economic growth. This result reinforces the model 1 result of a positive long run relationship between financial liberalization and economic growth. The results further suggest that interest rates have negative long run relationships with economic growth. Thus an increase in interest rates by one percentage point results in a 0.018% decrease in economic growth.

In model 3, GDP and INTR are the endogeneous variables. When the model is normalized on economic growth a positive long run relationship is observed with financial development, financial liberalization and interest rates. In model 3 the variable used is the broad money aggregate which is more a measure of financial deepening (Lynch, 1996). The result may be interpreted as financial deepening and financial liberalization having a stable long run relationship with economic growth. And while a negative was expected on the interest rates, the rationale for a positive influence of higher interest rates on economic growth may be explained via the MS hypothesis. Since higher interest rates are chief component of financial liberalization, then higher interest rates may have spurred a viable savings environment and through financial development and financial deepening i.e. quality investment this translated to economic growth. The dummy variable for democracy is significant in this model signifying that the new democratic dispensation had significant effects on the outcome of this model.

Furthermore, when interest rates are used as the endogeneous variable it is observed that a negative long run relationship exists with financial deepening and economic growth, while interest rates and financial liberalization exhibits a long run positive relationship. This result for model 3 is also statistically and economically meaningful as higher interest rates that take a cue from economic cycles are a feature of financial liberalization. The negative relationships are rational as high interest rates may be prohibitive to the development of the financial sector. And high interest rates may retard economic growth, in fact raising interest rates is usually a tool used to contract an overheating "economy". Dummy 5 representing the 2001 world trade recession

crisis has a significant effect on this model. This could be primarily because the model was normalized on interest rates and the trade recession coupled with September 11 attacks also caused uncertainty in the market. This caused negative expectations that affected interest rates and economic momentum. South Africa could have been affected adversely through the contagion effect, since its capital market movement is analogous to those in the USA and various international capital markets (Jefferis *et al*, 1999; Samouilhan, 2006 and Collins and Biekpe,2002).

Model 4, when the model is normalized on GDP it is observed that there is positive long run relationships with financial development and financial liberalization with economic growth. Model 4 reinforces the result that was obtained in the previous models that financial liberalization possesses a positive long run relationship with economic growth. In model 4, a one percent increase in financial liberalization increases economic growth by a significant 0.355%. More simply financial liberalization has a stable long run relationship with economic growth. Moreover model 2 (FIBINDEX) and model 3 (GDP) assert the notion that the positive long run relationship exists also with financial development.

When the model is normalized on financial development we find that the results suggest that financial development has a positive long run relationship with financial liberalization and a negative relationship with interest rates. The results for long run cointegration results for the four models are summarized in table 5.5.

Table 5.5: VECM: Estimated long run parameters

	Model 1	Model 2		Model 3		Model 4	
Normalized Variable	GDP	GDP	F. Lib	GDP	Intr	GDP	FD
Explanatory Variables							
INTERCEPT	-4.874	-6.179	11.339	4.391	-111.761	-4.886163	-0.71843
FD	-0.088[-2.56]	-0.970[-1.99]	1.871[4.41]	4.80[4.45]	-122.181[-5.32]	0.086[0.58]	NA
FLIBINDEX	0.227[4.76]	0.831[7.79]	NA	0.038[0.40]	0.963[0.37]	0.355[2.59]	4.152[4.98]
GDP	NA	NA	1.835[1.27]	NA	-25.453[-0.74]	NA	-11.68[-0.77]
INTR	-0.007[-2.92]	- 0.018[-3.39]	-0.032[-3.93]	0.039[5.14]	NA	-0.044[-6.19]	-0.515[-6.17]
Dum1	-0.007[-0.33]	0.001[0.09]	0.408[6.36]	0.009[2.37]	-0.941[-0.93]	-0.002[-0.55]	-0.002[-0.55]
Dum2	0.003[0.41]	0.008[1.19]	0.046[0.72]	0.008[1.19]	-2.235[-1.33]	-0.002[-0.29]	0.148[1.27]
Dum3	-0.009[-1.24]	-0.008[1.03]	-0.025[-0.34]	-0.002[-0.31]	3.33[1.86]	-0.002[-0.32]	-0.002[-0.29]
Dum4	-0.016[-2.02]	0.009[0.67]	-0.358[-2.98]	-0.009[-1.19]	3.367[1.71]	-0.003[-0.42]	0.0027[0.28]
Dum5	-0.001[-0.91]	-0.007[-1.03]	-0.089[-1.39]	0.003[0.47]	4.83[2.62]	0.003[0.29]	-0.008[-1.45]
ECM	-0.109[-2.31]	-0.032[-2.03]	-0.575[-6.12]	-0.033[-2.56]	-0.790[-5.93]	-0.048[-4.33]	-0.004[-4.33]
Adj R^2	0.33	0.31	0.54	0.34	0.49	0.611881	0.611881
Ser Corr.	14.927(0.53)	21.351(0.17)	21.351(0.17)	21.044(0.18)	21.044(0.18)	17.72(0.34)	7.961(0.95)

Notes: t-values in parenthesis The ECM are the short run adjustment coefficient of the VECM, and S.Cor is the serial correlation of the model. T- Values in parenthesis. Source: Thompson DataStream (2009), South African Reserve Bank (2010) and author's own estimates using E-views 6

All the error correction coefficients for all the models were negative and significant thus implying that the dependent variable(s) in each model returns to its equilibrium level with the various independent variables in the case of a short run disequilibrium. For the models that were normalized on GDP, we find that model 1 suggests that it returns to equilibrium the fastest as it recovers 10.9% each year. And for the model that was normalized on financial liberalization we find that the model corrects 57% each year while the model regressed on interest rates returns to equilibrium even quicker as it corrects 79% per year.

5.4 ROBUSTNESS CHECKS.

To ensure that the cointegration results are also applicable to a more dynamic model, several control variables are added to the four models. The results for the models with control and dummy variables are shown in tables 5.6; 5.7; 5.8 and 5.9.

Model 1

Table 5.6 Model 1 with control variables

Normalized Variable	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Explanatory Variables							
INTERCEPT	-2.831063	-4.676468	-5.139	-4.570368	-3.533769	-6.433860	-4.949152
FD	0.0462[2.71]	0.007[0.30]	-0.063[-4.06]	-0.034[-1.63]	0.021[0.67]	-0.126[-2.58]	-0.186[-2.22]
FLIBINDEX	0.110[3.90]	0.291[5.80]	0.167[7.19]	0.207[7.46]	0.171[4.81]	0.393[4.95]	0.600[4.51]
INTR	0.002[2.05]	- 0.030[-6.20]	-0.008[-7.19]	-0.014[-8.26]	0.012[-4.25]	0.018[5.13]	-0.049[-7.26]
CPI	-0.088[-3.51]	-0.044[-1.08]					
Gvt. Debt	0.005[0.06]		-0.204[-3.11]				
Inv	0.328[4.09]			0.093[1.22]			
Savings	0.704[8.46]				0.651[3.00]		
TOP	0.011[0.08]					- 1.116[-3.23]	
Health	0.091[3.62]						0.635[2.86]
Dum1	0.008[2.19]	-0.012[-1.91]	-0.013[-2.31]	-0.025[-2.96]	-0.009[-1.59]	0.003[0.85]	-0.006[-1.06]
Dum2	0.008[1.21]	0.004[0.55]	0.001[0.12]	-0.002[-0.38]	0.006[0.85]	0.004[0.70]	0.001[0.21]
Dum3	-0.005[-0.67]	-0.004[-0.51]	-0.004[-0.74]	-0.006[-0.92]	-0.011[-1.52]	-0.008[-1.23]	-0.010[-1.51]
Dum4	-0.005[-0.81]	0.007[0.56]	-0.001[-0.03]	0.001[0.06]	0.003[0.22]	0.005[0.76]	0.007[0.61]
Dum5	-0.012[-1.68]	0.01[0.13]	-0.000[-0.05]	-0.005[-0.47]	0.000[0.04]	-0.011[-1.58]	-0.006[-0.96]
ECM	-0.071[-2.42]	-0.087[-2.70]	-0.237[-4.41]	-0.194[-3.42]	-0.133[-2.46]	-0.089[-3.29]	-0.051[-3.72]
Adj R^2	0.194749	0.552244	0.613564	0.602590	0.549862	0.406276	0.529920
Ser Corr.	80.005(0.15)	33.09(0.13)	26.12(0.40)	16.21(0.91)	33.12(0.13)	16.91(0.89)	33.44(0.11)

Notes: t-values in parenthesis The ECM are the short run adjustment coefficient of the VECM, and S.Cor is the serial correlation of the model. T- Values in parenthesis. Source: Thompson DataStream (2009), South African Reserve Bank (2010) and author's own estimates using E-views 6

Model 1 is run with all the control variables and the results are shown in the first column. This model has a negative error correction coefficient that is meaningful i.e. negative and significant. The result suggests that economic growth exhibits stable long run relationships with financial

development, financial liberalization, interest rates and all the control variables with the exception of inflation. This result may be classified as meaningful for the control variables as *a priori* investment, savings, trade (TOP) and health are expected to have a positive relationship with economic growth. Since higher interest rates may increase the attractiveness of saving, thus higher savings rate result in the economy. Due to increased savings, the deposit taking institutions are now able to extend loans therefore investments increase. Investments in this case would increase in two ways, firstly a rise in domestic credit extension to the private sector via the deposit taking institutions. Secondly the high interest rates and a financially liberalized sector may attract foreign investors and quality long term investments which all have a positive impact on economic growth. The trade openness variable is positively related to economic growth thus signifying that trade openness is positive for the economy in the long run. As such the trade openness result is reinforced by Chaudry (2006) and Loots (2002) for Pakistan and South Africa respectively. The health variable is an important measure that seeks to control for human capital development in the economy (McDonald and Roberts, 2004). Thus an observed positive long run relationship with economic growth is in tandem with *a priori* expectations.

Parts of these results are rather suspicious as *a priori* we expected government debt to have a negative long run relationship with economic growth. This *a priori* expectation is premised on the fact that even though government debt may be used to further projects of a capital nature that are integral to economic growth. The counter argument is that in order to service this debt government must tax economic participants now. Tax in its many forms is widely regarded as inhibiting economic growth. With regard to financial liberalization Giovaninni and de Melo (1993) assert that tax maybe direct or manifest in inflation tax in order to service government debt. These wrong signs in the results may signify the presence of multicollinearity. Additionally given our limited sample size a model with so many variables runs the risk of violating the asymptotic properties of the data. To this end and in similar fashion with Aziakpono (2009) we add the control variables one at a time.

We add the control variables into the model one at a time in order to observe the effect and relationship between the control variable and economic growth as well as the other variables in model 1. We observe an interesting trend when the control variables are added separately. For example the initial model suggests that a positive relationship exists between government debt and economic growth, but when government debt is added separately it now gives an intuitively appealing result i.e. a 1% increase in government debt decreases economic growth by 0.204%, consequently government debt has a negative long run relationship with economic growth. Thus

this result gives credence to the practice of fiscal discipline. The trade openness result also changes suggesting that there exists a negative long run relationship between economic growth and trade openness.

Model 2

Table 5.7 Model 2 with control variable

Normalized Variable	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Explanatory Variables							
INTERCEPT	-3.649667	-5.225283	-5.802108	-4.285010	-0.529004	-6.952302	-10.85916
FD	0.036[16.50]	-0.384[-4.42]	-0.519[-5.05]	-0.063[-0.39]	-1.331[-5.34]	-0.872[-4.34]	5.906[4.77]
FLIBINDEX	0.035[3.02]	0.239[10.37]	0.182[7.26]	0.210[6.11]	0.055[1.11]	0.344[6.68]	3.107[9.61]
INTR	-0.001[-1.29]	-0.021[-10.68]	-0.005[-3.62]	- 0.011[-4.83]	0.003200	-0.014[-4.35]	-0.142[-7.16]
CPI	0.043[43.03]	-0.053[-2.81]					
Gvt. Debt	-0.300[-8.10]		-0.259[-2.82]				
Inv	0.117[3.19]			0.217[2.11]			
Savings	-0.047[-10.12]				1.071[4.76]		
TOP	0.054[-10.87]					-0.762[-2.72]	
Health	-0.013[-10.03]						3.346[4.99]
Dum1	-0.001[-0.07]	0.024[2.72]	0.001[0.29]	-0.018[-1.38]	0.003[0.54]	0.009[2.25]	0.004[0.61]
Dum2	0.010[1.36]	-0.008[-1.15]	0.008[1.31]	0.004[0.47]	0.0090[1.24]	0.008[1.18]	0.010[1.43]
Dum3	-0.002[-0.21]	0.010[1.41]	-0.006[-0.79]	-0.015[-1.45]	-0.006[0.78]	-0.006[-0.82]	-0.011[-1.14]
Dum4	-0.0145[-1.69]	0.012[0.97]	0.010[0.81]	-0.000[-0.16]	-0.011[-1.48]	0.013[1.07]	0.014[0.93]
Dum5	-0.0035[-0.40]	0.004[0.54]	-0.004[-0.63]	-0.001[-0.09]	-0.005[-0.80]	0.000[0.02]	-0.009[-1.19]
ECM	- 0.663[-1.67]	-0.164[-2.91]	-0.135[-2.36]	-0.118[-1.66]	-0.031[1.54]	-0.084[-2.40]	-0.005[-1.62]
Adj R^2	0.215724	0.520463	0.395427	0.238576	0.115500	0.367505	0.233519
Ser Corr.	92.134(0.19)	25.041[0.46]	18.304[0.83]	20.02[0.75]	32.15[0.15]	31.479[0.17]	34.010(0.11)

Notes: t-values in parenthesis The ECM are the short run adjustment coefficient of the VECM, and S.Cor is the serial correlation of the model. T- Values in parenthesis. Source: Thompson DataStream (2009), South African Reserve Bank (2010) and author's own estimates using E-views 6

In model 2, were the financial development is proxied by a traditional measure of financial development *viz;* domestic credit extension as a percentage of GDP. Here we observe positive long run relationships with economic growth and the following variables financial development, financial liberalization, inflation and investments. Negative long run relationships with economic growth are observed with interest rates, government debt, savings and health spending. These results would be difficult to interpret l*et al*one justify as they show evidence of multicollinearity. Therefore we move onto adding the control variables one at a time and observing those results. In so doing inflation and government debt now has correct signs thus signifying a negative long run relationship with economic growth. The only dummy variable that is significant is the independence dummy, signifying possibility of increased economic growth via the increased availability of credit to economic participants and viable projects in the economy. The error correction coefficient actually increases in the model with control variables versus the one without implying that model 2 (with control variables) corrects 66.3% per year back to equilibrium.

However, it is interesting to note that when the control variables are added one at a time i.e. inflation, it assumes a correct negative sign while financial development changes signs from positive to negative. Thus, this result suggests that financial development has a long run relationship with negative relationship with economic growth. Thus a 1% increase in CPI would result in a 0.053 % decrease in economic growth while a 1% increase in government debt will result in 0.259% rise in economic growth; the trade openness variable also exhibits negative long run relationship with economic growth where a 1% increase in trade openness will result in a 0.762% decrease in economic growth. Financial liberalization has a positive long run relationship with GDP and interest rates possess the opposite. These results did not change with the addition of control variables hence such results are considered robust

Model3

Table 5.8 Model 3 with control variables

Normalized Variable	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Explanatory Variables							
INTERCEPT	-3.649667	-4.357015	-28.66255	-6.349781	-17.69066	-9.496858	-38.13810
FD	0.770[6.70]	0.146[0.31]	-12.482[-8.93]	-0.649[-0.55]	8.529[4.42]neg	2.538[6.24]	18.084[9.99]
FLIBINDEX	0.035[3.06]	0.112[2.34]	0.149[1.49]	0.191[2.33]	0.384[2.29]	0.005[0.21]	-0.017[-0.16]
INTR	-0.001[-1.29]	-0.010[-4.81]	-0.114[-11.63]	-0.057[-7.57]	-0.070[-5.19]	-0.016[-7.61]	-0.113[-8.01]
CPI	0.049[55.68]	-0.056[-1.22]					
Gvt Debt	-0.300[8.10]		-0.528[-1.57]				
Inv	0.117[3.19]			0.065[0.20]			
Savings	0.008[0.17]				1.655[1.87]		
TOP	-0.297[-5.12]					-0.326[-1.73]	
Health	0.102[7.52]						0.671[1.75]
Dum1	-0.001[-0.68]	0.004[1.11]	0.022[3.53]	0.007[1.48]	0.006[1.64]	0.015[2.81]	0.004[0.80]
Dum2	0.010[1.36]	0.003[0.43]	0.011[2.09]	0.002[0.28]	0.0101[1.84]	0.015[2.55]	0.009[1.58]
Dum3	-0.002[-0.29]	-0.009[-0.13]	0.014[1.83]	-0.005[-0.66]	-0.004[0.67]	-0.003[-0.43]	0.012[1.40]
Dum4	-0.014[-1.69]	-0.009[-1.37]	0.013[1.17]	0.011[0.95]	-0.009[-1.39]	0.009[0.76]	-0.001[0.10]
Dum5	-0.004[-0.39	-0.002[-0.36]	0.004[0.58]	-0.003[-0.51]	0.007[1.05]	0.021[2.52]	0.009[1.10]
ECM	0.158[1.33]	-0.096[-4.25]	-0.047[-4.71]	-0.042[-3.45]	-0.023[-3.43]	-0.185[-4.03]	-0.028[-3.55]
Adj R^2	0.215724	0.387654	0.685242	0.469331	0.475784	0.597245	0.569417
Ser Corr.	92.13[0.18]	29.98[0.23]	17.874(0.84)	30.165(0.21)	31.069[0.19]	22.35[0.62]	32.313[0.15]

Notes: t-values in parenthesis The ECM are the short run adjustment coefficient of the VECM, and S.Cor is the serial correlation of the model. T- Values in parenthesis. Source: Thompson DataStream (2009), South African Reserve Bank (2010) and author's own estimates using E-views 6

For the results of model 3 in table 5.8 , where the financial development is proxied by the broad money aggregate measure as a percentage of GDP. This result suggests that the broad money aggregate measure of financial development or financial deepening produces results that are

close to the *a priori* expectations. The results suggest that GDP has positive long run relationships with financial development, financial liberalization, inflation, investments, and savings. Such results are intuitively appealing as long run relationships are expected between economic and financial development and financial liberalization. This result is principally supported by MS hypothesis that proposes a stable relationship between savings and investments that lead to economic growth (McKinnon, 1973). Inflation was expected to have a negative long run relationship with economic growth. However, the results suggest that a 1% rise in inflation leads to a 0.049% increase in economic growth. This result could be plausible since a certain level of stable inflation is beneficial to the growth of the economy. This is exhibited in the unsurpassed economic growth phase that South Africa witnessed albeit in a stable inflationary environment. On the other hand negative long run relationships exist between INTR, GVTDBT and TOP. These results are in tandem with a priori expectations as the INTR result indicates that a 1% rise in interest rates may lead to 0.001% decrease in GDP.

However, the wrong signs could be due to multicollinearity. Thus the addition of control variables one at a time changes the CPI result. It now conforms to a priori expectations that a negative long run relationship exist between inflation and economic growth. All the other results change in magnitude but maintain the same relationship but interestingly financial development changes signs when certain control variables are used. In so doing, showing that the addition of a particular control variable renders negative, the long run relationship between financial development and economic growth. These control variables are government debt and investments indicating that M2 as a financial development proxy is highly responsive to the level of government debt and investments. This result is intuitively appealing as government debt through Open Market Operations (OMO) transactions impacts significantly on money supply. Furthermore, Giovannini and de Melo (1993) assert that through excessive government debt the financial markets may be repressed through 'crowding out'. Thus this negative relationship between government debt and economic growth reasserts the notion that excessive borrowing and or participation of government in financial markets may serve to financially repress the system. Thus, the control of government debt is a key component of improving financial development and thus domestic financial liberalization.

Investments may have a similar effect as they increase money in circulation as payments are effected for goods that make up the gross capital formation. Here the negative relationship may stem from the fact that the investments in gross capital formation may come from beyond South African borders. Such a result renders the local banking system mere conduits of foreign

exchange. The result suggests that a 1% increase in investments leads to a 0.065% increase in economic growth. While the relationship between economic growth and financial development becomes a negative long run relationship. The error correction coefficient in the model with all control variables was the largest at 15.8% implying that 15.8% corrects each year towards equilibrium in this model. While dummy 1, dummy 2 and dummy 5 were significant thus suggesting that democratic dispensation, Asian financial crisis and world trade recession of 2001 had significant effects on the model outcome. This result serves to fortify the result in models 1 and 2 that the democratic dispensation had a significant effect on economic growth and other economic variables.

Model 4

Table 5.9 Model 4 with control variables

Normalized Variable	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Explanatory Variables							
INTERCEPT	-2.191562	-4.978444	-4.892894	-4.077197	-3.780633	-4.802986	-4.497695
FD	0.126[3.72]	0.255[1.50]	-0.079[-3.15]	0.032[1.68]	0.076[2.74]	0.009[0.17]	-0.183[-0.68]
FLIBINDEX	0.131[3.32]	0.110[0.73]	0.156[6.25]	0.086[5.31]	0.041[1.39]	0.188[2.64]	0.665[2.35]
INTR	0.003[2.23]	-0.042[-4.39]	-0.010[-7.56]	-0.005[-4.60]	-0.003[-2.17]	0.019[4.21]	0.0883[6.05]
CPI	0.033[1.12]	-0.165[-1.25]					
Gvt.Debt	0.152[1.26]		-0.208[-2.96]				
Inv	0.518[4.33]			-0.284[-6.10]			
Savings	0.922[7.88]				0.489[4.72]		
TOP	0.007[0.03]					0.175[0.89]	
Health	-0.112[-3.31]						0.698[1.50]
Dum1	0.008[2.21]	0.003[0.54]	-0.012[-2.24]	-0.011[-1.49]	0.005[1.36]	-0.010[-1.38]	-0.0005[-0.11]
Dum2	0.008[1.19]	0.000[0.02]	-0.002[-0.41]	-0.007[-0.99]	0.009[1.45]	-0.003[-0.42]	-0.001[-0.13]
Dum3	-0.005[-0.69]	-0.006[-1.01]	-0.003[-0.47]	-0.006[-0.71]	-0.009[-1.37]	-0.006[-0.71]	-0.005[-0.88]
Dum4	-0.012[-1.69]	-0.010[-1.40]	-0.003[-0.33]	-0.009[-0.69]	-0.009[-1.40]	-0.005[-0.33]	0.006[0.53]
Dum5	-0.006[-0.93]	-0.008[-1.35]	-0.000[-0.06]	-0.002[-0.26]	0.001[0.26]	0.000[0.02]	-0.008[-1.37]
ECM	-0.052[-2.51]	-0.027[-2.70]	-0.218[-4.80]	-0.190[-1.73]	-0.162[-4.60]	-0.121[-2.35]	-0.028[-3.40]
Adj R^2	0.203594	0.422532	0.656719	0.536970	0.423085	0.524770	0.569364
Ser Corr.	80.47[0.49]	25.247[0.44]	19.499[0.77]	18.84[0.80]	22.761[0.59]	13.27[0.97]	33.88[0.11]
k	1		3	4	1	4	3

Notes: t-values in parenthesis The ECM are the short run adjustment coefficient of the VECM, and S.Cor is the serial correlation of the model. T- Values in parenthesis. Source: Thompson DataStream (2009), South African Reserve Bank (2010) and author's own estimates using E-views 6

In model 4, where financial development is proxied by JSE turnover as a percentage of GDP. The results suggest that economic growth has positive long run relationships with all the variables except for health. The positively cointegrated results for financial development, financial liberalization, investments and savings merely reinforces the results obtained in the previous models and asserts *a priori* expectations premised on economic theory. Since, stock market turnover has a positive long run relationship with GDP the result favours the notion that stock markets are critical to economic growth as they provide another financing avenue for

firms. This assertion is in line with the results by (Levine, 1998; Filer *et al*, 1999 and Shahbaz *et al*, 2008).

However, not all coefficients in the model conform to all *a priori* expectations. Since positive long run relationships are proposed for the following variables inflation, interest rates and government debt while we would prudently expect the reverse. The inflation result could be interpreted as inflation being positively related to economic growth. Economic growth may be positively affected as in times of high inflation economic participants' shift to stocks in order to hedge against inflation (Mahoney, 2001). Nonetheless, we begin the process of adding the control variables one at a time and find that inflation now has a negative long run relationship with economic growth while government debt and interest rates follow suit. These results are meaningful and in line with *a priori* expectations.

Savings and trade openness do not change signs but remain positive and this process indicates robustness of these results. Furthermore, the health variable changes signs and exhibits a positive long run relationship with economic growth as a 1% increase in spending on health raises economic growth by 0.698% which is a significant magnitude on the overall health of the economy. This shows the importance of human capital development and health on long run economic growth. This result is economically meaningful and highlights the importance of a healthy working population as economic productivity may be adversely affected due to ill health. Such result is further asserted by studies by Ogujiuba and Adeniyi (2005); Son (2007) which empirically validates that stimulus of human capital development spurs economic growth. These studies pertain to two developing countries i.e. Nigeria and Philippines. Moreover, a study by McDonald and Roberts (2004) that includes South Africa concludes similarly that human capital development in terms of household expenditure on health and HIV/AIDS reduction is positively related with economic growth. The error correction coefficient is again significant and in model 4 corrects 5.2% per year which is a very low rate of returning to equilibrium. On the other hand dummy 1 for independence shows that the democratic dispensation in South Africa truly had an effect on all the models in this study and the economic growth in South Africa.

5.4.1 Synopsis of results of long run terms

The results of the Johansen cointegration test and the VECM in all the models suggest that there is a positive long run relationship between financial liberalization and economic growth. Such a result is further reinforced by the tests carried out with control and dummy variables. This result is intuitively appealing as it confirms the theoretical MS hypothesis and empirical literature such

as Aron and Muellbauer (2000); Tswamuno *et al*, (2007); Odhiambo, (2009) who found that there is a positive relationship between financial liberalization and economic growth in South Africa.

The financial development result seems to be a rather volatile result and depends on the proxy used. The financial development index that consists of amalgamated financial development measures seems to have an overall picture depicting a positive long run relationship with economic growth. This result is in line with a priori expectations and vast economic theory in support of financial development as a precursor and a positive cointegrated relationship with economic growth (Levine, 1998; Levine and Zervos, 1998; Rousseau, 1999; Ang and Mckiibbin, 2007; Odhiambo, 2009). This could be an indication that financial development is integral for economic growth.

However, the results for the relationship with economic growth are not consistent across all models. Other models suggest a long run negative relationship between financial development and economic growth. The assertion of a negative relationship between financial development and economic growth may be probable since we are using historical data for our interpretations. It may be interpreted as financial development in South Africa being repressed thus the suggested results exhibit a negative long run relationship with economic growth. The lack of financial development is in the form of an oligopolistic banking sector as alluded to in Chapter 3. Furthermore the savings culture in South Africa has negatively affected the quality of investment thus financial development. As financial development measures the efficiency to which financial intermediaries are able to change deposits into loans. This is reflected in the measure of domestic credit extended to the private sector. The JSE turnover is an important measure, since the stock market is an integral part of the economy. Here the exchange controls i.e. restrictions on money transferable out of the country and stock market ownership limits impede the growth of this measure. (Tswamuno *et al*, 2007) alludes to the fact that most credit extended in the local financial sector belongs to foreigners. Thus it is prudent to assume that relaxation of credit controls allowing entry and exit of finances in South Africa would increase credit available to the private sector *ceteris paribus*.

The interest rate result also proved to be fairly robust in all models. The results suggested that interest rates have a negative long run relationship with economic growth. An appealing result stemming from the fact that high interest rates may be prohibitive to borrowing and consumption thus high interest rates would prudently be assumed to be negatively cointegrated with economic growth. Moreover, since interest rate liberalization is catered for in the financial

liberalization index we prudently conclude that interest rate liberalization has a positive long run relationship with economic growth a notion reinforced by (Odhiambo, 2009) for South Africa.

The control variables proved to be a vital robustness checks as some results that did not proffer economically meaningful results changed when the control variables were added one by one. The inflation and trade openness result was most notable in this regard. This showed that inflation can be regarded as a double edged sword that can at times be beneficial to the economy albeit in excess an adverse impact on the economy can be expected. The trade openness result also showed similar characteristics indicating its potential pros and cons. Model 1 and 2 maintain a negative long run relationship for trade openness with economic growth while models 3 and 4 suggest a positive long run relationship. Thus model 1 and 2 serves to reinforce South Africa's reluctance to change trade laws in some industries such as the automobile industry. South Africa restricts the importation of motor vehicles in favor of local industry so as to protect the local market. The automobile industry is estimated to contribute 7% to GDP (SAINFOb, 2010).

Investments and savings behave fairly well and generally conform to *a priori* expectations. And generally have a positive long run relationship with economic growth. This result is intuitively appealing as such a relationship is theoretically and empirically validated. The MS hypothesis theoretically advances this relationship (Shaw, 1973).

5.4.2 Impulse response

A shock to the n-th variable not only directly affects the n-th variable but it may also be transmitted to all of the other endogenous variables through the dynamic lag structure of the VAR. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables (E-views Guide)

The impulse response results are reported in *Appendix A*. The focus is on the responses of GDP, FINLIBINDEX and FD to shocks in its determinants since the study investigates the interactions of these variables with each other and other pertinent variables. Most of the impulse response analysis results have the correct signs and verify some of the findings from the short run analysis. For the impulse responses on LGDP shown in Appendix C, a one period standard deviation shock on LGDP produces a large positive impact on itself that is persistent over time. LM2, LGVTDBT exhibits a similar trend although the initial impact is not large however the positive impact is persistent over time. LCPI and LINTR follow the reverse as GDP has a negative impact on LCPI, INTR that is persistent over time while innovations to LSAVINGS

and LINV seem small and negative. FD is initially negative but in the eighth year becomes positive while FLIBINDEX is initially positive declining in the sixth year and becoming positive again in the eighth. LJSETURN is initially positive but declines and dips in to the negative in the fourth year and becomes positive and persistent thereafter.

For impulse responses on FLIBINDEX, it produces an initial positive impact on itself that dips sharply and becomes negative and persistent overtime. Similarly LGDP begins with a small positive impact that becomes negative in the second year and rises again for three years only to become negative and persistent thereafter. Innovations on the following variables FD, INTR, LCPI, and LM2 exhibit an initial negative impact that becomes positive and persistent. LJSETURN is initially positive but dips and becomes negative in the fifth year. For the LINV, LDCE, LGVTDBT and LSAVINGS variables their impact is minimal and tends to quickly fizzle out.

The results of innovations on FD are similar to those on the VECM results with and without control variables. FD exhibits unstable relationships with many of the other variables. Again the impulse response results show that FD has an initially positive impact on itself that dips sharply into the negative in the second year becoming positive again in the sixth and generally dies off. FLIBINDEX has a small initial positive impact that dips in the fourth year and becoming positive again in the eighth year. INTR stars off negative and becomes positive in the fourth year and dips again in the eighth year. Similarly LCPI and LJSETURN start off positively but no trend is discernable and the impact eventually dies off. The innovations on the LGDP, LDCE, LGVTDBT, LM2, LSAVINGS, LTOP and LINV have minimal impact that generally quickly dies off

5.4.3 Variance decomposition

This analysis provides a mechanism of assessing the relative importance of shocks to each of the determinants of GDP, FD, and FINLIBINDEX in explaining its variations. Similar to the impulse response analysis, only the results of changes in the selected variables following shocks to itself or its determinants are discussed. The results of variance decomposition for the models are presented in appendix B.

GDP is explained by itself only by 34.21% after ten years. This is consistent with impulse response results and serves to buttress the agglomeration effect which is a micro economics phrase that means that current and future values are determined by its own past values (Ahmed

et al, 2005). The other variables together account for 65.69% of the error variance, where CPI and interest rates explain a significant 9.51% and 25% error variance respectively. FD explains 8.86%, LJSETURN explains 6.43%, LGVTDBT explains 4.5%, FLIBINDEX explains 4.07% and LM2 explains 4.71% while LTOP and LSAVINGS each explain very little of the forecast error variance as each variable explains less than 2% to the forecast error variance.

FLIBINDEX explains 18.19% of the error variance of itself after ten years. This low number is expected as FLIBINDEX is an index of changes in statutes regarding the financial markets. Thus it is expected that in the tenth year, its effects may not be noticeable as they would have been absorbed as into normal operation of the affected sector and thus the financial liberalization aspect may become indiscernible. The FD index explains a significant 10.48% of the forecast error variance in FLIBINDEX. This reinforces the impulse response and the cointegration results that a stable long run relationship exists. INTR explains a considerable 20.79% of the error variance of LGDP. However, this result is intuitively appealing and asserts the proposal of Williamson (2002) that domestic financial liberalization mainly pertains to interest rate liberalization which is posited to have a positive impact on long term economic growth. LGDP explains 6.99% of the error variance in FLIBINDEX; this lends some credence to the point put forward by (Robison, 1952) that the economy must grow to a certain level before financial liberalization policies can be implemented. Furthermore the LJSETURN, LCPI, LM2, LDCE explain a sizeable 12.76%, 9.16%,8.48%,5.40%,2.58%, 2.39% respectively. LTOP and LGVTDBT explain a smaller variation as each of these variable explains less than 2% of the forecast error variance in the FLIBINDEX. There is a wide dispersion in the forecast error variance which could be indicative of the possibility that financial liberalization affecting a broad spectrum of economic indicators as evidenced in the data used in this study.

FD explains 24.54% of the error variance of itself after ten years. The other variables put together explain 75.46% of the variance while the components of FD (LM2, LJSETURN and LDCE) explain a significant 28% of the total error variance. The result suggests that LJSETURN explains a considerable 20.03%, LM2 explains 6.56% and LDCE explains 2.34%. The other variables that contributed significantly are LGVTDBT 3.48%, LINTR 19.94%, LCPI 7.63% and LGDP 2.64%. The remaining variables each explain very little of the forecast error variance as each variable explains less than 2% to the forecast error variance.

Variance decomposition analysis has revealed that while FLIBINDEX, FD are important to economic growth there are other variables that aid to better explain the forecast error variance of

GDP. The FLIBINDEX seems to be having diminishing power in explaining the forecast error variance for GDP over time. This is a plausible result as laws can be changed to a certain level while some laws must stay in place to ensure prudent regulations in the market (Vittas, 1992). LGVTDBT, INTR, LCPI, FD and LJSETURN seem to have greater explanatory power of GDP. However, the importance of, LGVTDBT, FD and LJSETURN seems to be declining while that of LGVTDBT increases. The INTR, LCPI, LJSETUTRN variables also appear to have significant explanatory power with regard to error forecast variance for LGDP, FD and FILINDEX.

5.5 GRANGER CAUSALITY TESTS

The Johansen cointegration tests carried out have affirmed the existence of stable long run relationships among the variables. However, since the presence of cointegrating relationships has implications for the way in which causality occurs, Granger causality tests are also carried out. The Granger causality test results will seek to examine the fit of the South African economic data into the MS hypothesis which proposes a chronological order for the interaction of variables in the interest rate, savings and investment nexus. This order has implications on the financial development, financial liberalization and economic growth nexus. The MS hypothesis puts forward the idea that financial liberalization through higher interest rates causes increased savings which are turned into quality investments that ultimately lead to economic growth. Thus MS aggregate asserts that financial liberalization leads to financial development and ultimately economic growth. Such a posit is held by Chaudry (2006). The results of the Granger causality tests are shown below.

Table 5.10: Granger Causality Results

Granger Causality

Variables	Lags	Probability	Result
FLIBINDEX-LGDP	4	0.005	Financial liberalization granger causes GDP
LGDP-FLIBINDEX	4	0.317	
FD-FLIBINDEX	5	0.370	No clear causal relationship exists between financial
FLIBINDEX-FD	5	0.271	development and financial liberalization. Thus possibility of bidirectional causality.
INTR-FLIBINDEX	5	0.395	Financial liberalization granger causes interest rates
FLIBINDEX-INTR	5	0.028	
FLIBINDEX-SAVING	2	0.020	Financial liberalization granger causes savings
SAVING-FLIBINDEX	2	0.368	
FLIBINDEX-INV	2	0.978	Investments granger cause financial liberalization
INV-FLIBINDEX	2	0.005	

SAVINGS-INV	4	0.832	Investments granger cause savings
INV-SAVINGS	4	0.001	
FLIBINDEX-LGVTDBT	2	0.375	Government debt granger causes financial liberalization
LGVTDBT-FLIBINDEX	2	0.095	
INV-GDP	2	0.280	GDP granger causes investments
GDP-INV	2	0.000	
FD-GDP	2	0.000	Financial development granger causes GDP
GDP-FD	2	0.558	
LGDP-LHEALTH	2	0.773	Health granger causes GDP
LHEALTH-LGDP	2	0.023	

The granger causality test results show firstly that financial liberalization granger causes GDP. This result is intuitively appealing and concurs with a priori expectations. The bi-directional causality between FD and FLIBINDEX is to be expected given the various signs that were recorded in the VECM results. This serves to show that both assertions are correct and the strength of the causality may change on a case by case basis. The interest rate result is meaningful as FLIBINDEX granger causes INTR, since the laws must be changed that limit the hand of government in the affairs of the central bank thereby rendering it independent. Furthermore the determination of interest rates should take cues from economic cycles.

Financial liberalization granger causes savings, such a position is put forward in the MS hypothesis that financial liberalization through market determined interest rates may cause an increase in savings. The study further tests for causality between savings and investments expecting savings to granger cause investments but instead finding that the data suggests that investments granger cause savings. And another surprising result is that GDP granger causes investments. This result although against the MS framework is plausible as the GDP and GDP growth rate are features that attract investors into a country thus if the GDP is low then few investors will not be willing to invest meaningfully and vice versa.

The FD granger result shows the importance of financial development on economic growth. FD granger causes GDP at the 1% level of significance. Another important variable that is not often controlled for in many studies is human development. The granger causality tests suggest that HEALTH granger causes GDP. An intuitively appealing result as the health of economic participants is important for economic activity in a country.

5.6 SYNOPSIS

This chapter analyzed the interaction between FD (M2, DCE, and JSETURN), INTR, GDP and FLIBINDEX using Johansen cointegration and vector error correction modeling framework. Graphical analysis and unit root tests showed that most of the series were non stationary in level but become stationary after first difference. Thereafter, the Johansen cointegartion tests were carried out in all models. Weak exogeneity tests confirmed the endogeneity of GDP while the diagnostic tests showed that residuals are well behaved.

Financial liberalization, investments, savings and health emerged as having significant positive and stable long run relationships with economic growth. Most of the impulse response analysis results had the correct signs and established the cointegration results but showed minimal response to innovations. Thus most shocks were not persistent. The variance decomposition results suggested that interest rates had significant explanatory power on economic growth. Other variance decomposition results showed that financial liberalization and financial development have a positive relationship and thus explain a significant portion of the other's forecast error variance. For financial development the stock market turnover explained a considerable 20% of the error variance.

On the other hand interest rates, government debt, inflation and trade openness were found to possess negative long run relationships with GDP. Again this was in line with a priori expectations and in line with much of the literature (Du Plessis and Smit, 2007; Giovannini and deMelo, 1993; Hodge, 2005 and Loots, 2002) respectively. Most of the impulse response analysis results had the correct signs and established the cointegration results but showed minimal response to innovations. LCPI also had significant long run relationships with GDP and the variance decomposition results suggest that it has explanatory power in the variance of GDP.

The Granger causality results reaffirmed some assertions of literature i.e. financial liberalization granger causes economic growth, financial development granger causes economic growth and health granger causes or precedes economic growth. However, it is implied by these results that for South Africa investments granger cause savings and economic growth granger causes investments. This is the reverse to the *a priori* expectations; as such it suggests that the South African economic data is not a perfect fit into the MS hypothesis but rather a Keynesian framework that believes in prior-investment (Odiambo, 2009). This may be due to the fact that South Africa has an unusual savings culture that has led to dissaving in the economy. And consequently investments are not directly taken from savings but elsewhere e.g. FDI. Moreover,

the high GDP and impressive growth rate may be an attractive investment incentive or manifestation of the agglomeration effect thus the economy is benefitting from inertia of past GDP. This is confirmed by the impulse response results were GDP has a large and positive effect on itself that is persistent over time.

CHAPETR 6: SUMMARY OF FINDINGS, POLICY RECOMMENDATIONS AND AREAS FOR FUTHER RESEARCH

6.1 SUMMARY OF FINDINGS

The study set out to ascertain the extent to which the MS hypothesis is borne out of South African economic data. This was with a view to establishing the extent of relationships between financial liberalization, financial development and economic growth. There was a review of theoretical and empirical literature. In this task there was an analysis of the financial sector and the real economy, the money transmission mechanism, financial repression its types and rationale. This gave way to a discussion of literature on the MS hypothesis which laid the ground for an analysis of the nexus between financial liberalization, financial development, interest rates and economic growth. And lastly, a look at how financial liberalization may affect the greater economy through literature on the interaction of monetary policy and financial liberalization

Empirical studies have generally split the study into three main segments: savings and interest rates (Micksell and Zinser, 1973; Giovannini ,1985 and Gupta,1987).Secondly, credit availability and investment (Fry, 1981; Greene and Villanuaeva, 1991). And, lastly the growth link (Levine and Zervos, 1998; Ang Bonfiglioli, 2005 and McKibbin, 2007). The section focusing on savings and interest rates showed that there was general consensus in the studies that there existed a long run stable relationship between savings and investments. Moreover, there was consensus that savings caused investment. The second segment focuses on credit availability and investments as an outgrowth of financial liberalization. Here it is shown that financial liberalization has effects on other facets of the economy other than savings, interest rates and economic growth. There are also empirics to support that credit availability creates positive factor productivity and capital accumulation (Bonfiglioli, 2005).

The growth link seems to assert widely that there is strong meaningful relationship between financial liberalization, financial development and economic growth (Levine, 1993; Rousseau, 1999; Bakaert *et al*, 2001). On the other hand, most of these studies were cross sectional studies based on weak statististical basis (Arestis and Demetriades, 1996). From this counter argument there is an attack on financial liberalization (Arestis, 2004; Ayadi, 2006) that financial liberalization may in fact lead to financial crisis. However, the empirical studies showed the varying positions that could emerge especially when a cross section of countries is studied; hence

the need for single country focus as the economic variables may interact differently from country to country.

Chapter 3 highlighted the broad financial sector reforms were undertaken post De Kock Commission. These reforms steadily changed till 1985 when there was the re-emergence of the financial rand in response to massive capital flight (Casterleign, 2001). The other reforms occurred in the 1990`s chief among them the opening up of the banking sector, reforms on the stock exchange and ultimately the use inflation targeting in 2001. Major reforms have already been undertaken and this is shown by the financial liberalization index that stays constant as from 2000 onwards. This chapter also showed sectorial analysis of the banking sector and the banking sector and the overall economy. A peer review is tabled of financial liberalization status of various SADC countries in the latter part of the chapter.

The Johansen cointegration results show that there is stable long run relationships to GDP with the following variables; financial liberalization, savings, investment and health. These results confirmed past South African studies (Tswamuno *et al*, 2007; Odhiambo, 2009). While, the following had negative long run relationships with GDP; interest rates, inflation, government debt. These results were consistent throughout all models and statistically significant.

The following variables relationships with economic growth changed from model to model i.e. financial development and trade openness. Financial development went against a priori expectations as it exhibited signs of a negative long run relationship with GDP. The cointegrating relationship between economic growth and financial development showed that financial development exerts a significant impact on economic growth. However, the effect depended on the measure used for financial development. This result is in line with the findings of Amusa (2000) and Takaendesa and Odhiambo (2005) for South Africa. The impulse response results set to reinforce the VECM results. While the granger causality results showed causality with some surprising results i.e. that investments granger cause savings and economic growth granger causing investments. This asserts the mantra "where enterprise leads finance follows" (Robinson, 1952). Thus the MS hypothesis is not completely manifest in the South African data, however it is an important starting point for analysis of financial liberalization and financial development issues.

6.2 POLICY IMPLICATIONS

The following recommendation may be advanced to financial policy-makers, governments on the basis of the findings of the study. The results strongly favour financial liberalization theory as a long run positive relationship between economic growth and financial liberalization exists (McKinnon, 1973). The interest rate facet is in line with a fully liberalized sector as it takes a cue from economic cycles and it is determined by a credible and independent central bank (Wessels, 2006). However, it is important to note that financial liberalization is not only interest rate liberalization, therefore, the South African government should continue to liberalize the financial sector through allowing more players into the banking sector, relaxing exchange controls and increased trade openness. Conversely, there is empirical evidence suggesting that financial liberalization can bring destabilization of the financial system and generate financial crises in the absence of suitable sound macroeconomic policies (Villanueva and Mirakhor, 1990). The South African government has historically done well in this regard. As policies regarding liberalizing the financial markets have generally been taken with due regard to potential problems. Thus South Africa instituted some levels of protectionism in the form of the financial rand and exchange controls as in Mexico and Chile (Kassimatis and Spyrous, 2001).

Financial development relationship with economic growth though sensitive to measures used is important to economic growth (Amusa, 2000). Therefore, financial liberalization measures must be complemented in order to translate into financial development and financial deepening that will ultimately translate to economic growth. This may be done primarily by easing credit terms to private businesses, greater penetration into the unbanked masses in South Africa (Daniel, 2010).

The savings and interest rate nexus is the reverse to the MS hypothesis. Thus the South African case is odd and a correction of the savings culture will enable the savings to be converted to quality investments for productive means (Mckinnon, 1973). It is thus of paramount importance that there is concerted effort by the monetary authorities that highlights and serves to change the savings culture paradigm. There is currently the South African Savings Institute (SASI) trying to implement this mandate. However SASI is currently independent and not in the public domain, thus it should be taken under the ambit of the ministry of finance and extensively market itself and its cause to individuals and households through a campaign aimed at changing the savings culture.

The inflation results showed a consistent negative long run relationship with economic growth, thus asserting the notion that low stable inflation is necessary for sustainable long term economic growth (SARB, 2010). In this regard South Africa must be commended for using the inflation targeting framework successfully to contain inflation within the set parameters of 3 to 6 percent. It is noteworthy that the success of inflation targeting is not only embedded in controlling prices but also includes anchoring of inflation expectations, reduced inflation forecast errors, lower inflation inertia and a weaker relationship between inflation and cost-push factors such as oil price changes (Burger and Marinkov,2007).

Government debt did not only serve as a control variable, but also as an important facet of financial liberalization. A financially repressed market is typified by excessive government intervention in the financial markets in terms of legislation and stifling lending through ballooning government debt. The level of government debt exhibited a negative relationship with economic growth primarily through the 'crowding out effect' (Giovannini and de Melo, 1993). According to the SARB (2010) if government debt exceeds 60 per cent of annual gross domestic product, it is deemed to be excessive in terms of European Union criteria. A very high borrowing ratio implies that a high proportion of the productive sources of a country is utilized by government in its operations. As a result, the private sector has less access to funding for its operations. Thus; it would be prudent for South Africa to increase the practice of 'fiscal discipline' i.e. maximizing revenue collection by widening the tax base and eliminating non essentials from budget e.g. lavish expenditures by ministers and other civil servants would be a good starting point.

Trade openness showed mixed results in relation to economic growth. Thus some industries need more protection than others e.g. automobile industry that contributes about 8% to GDP and the cotton industry that employs about 58 000 seasonal workers (NDA, 2006). Therefore trade openness is an important contributor to economic growth (Loots, 2002). The government must also give due regard to employment creation in the country thus some industries may benefit from increased openness whilst some may benefit from extended protectionism. This reinforces the findings of Villanueva and Markhor (1990) that concluded that it is important to provide some level of protectionism in the infant stages of any liberalization effort.

In light of the findings, South Africa would benefit immensely from increased financial liberalization and financial development. The relaxation of exchange controls and entry of more banks would bring much needed stable capital inflows. The increased banking competition will

ultimately benefit the customers in terms of lower bank charges and wider service provision. The savings culture should improve at the household level as this would benefit financial intermediation and investments positively. As for the inflation, interest rates the responsible authorities should continue on their positive path as current policies are positive and encourage growth.

6.3 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

Major limitations of most empirical studies are related to data. Variables such as commercial bank assets and derivative contracts which are important and more sophisticated measures of financial development were not included in the models because of data constraints. Furthermore due to the dynamic nature of economics it would have been desirable to have more variables to the model, however the inclusion of too many variables will lead to the loss of degrees of freedom thus one is unable to estimate a model with too many variables. Our models were composed into four models and then into a further four models for robustness checks. This procedure of decomposing the model has weaknesses in that research does not provide a conclusive single model with all the variable relationships with economic growth. Other studies could also use the causality tests that can test three relationships.

This study identified areas where further studies could be conducted in order to improve the quality of the results. Firstly, the study used traditional measures of financial development and constructed joint financial development index to proxy financial development in South Africa. Future studies may use other measures of development such as price based indicators, stock market based indicators in an individual or joint manner to represent financial development in a holistic way.

This study also highlighted but did not delve into the effects of legal statutes on economic growth. This was highlighted in the phase wise capturing of the financial liberalization index data. It took into account that there are various steps that may take place in altering laws. As such Beck and Levine (2002) allude to the fact that there is growing literature suggestive of the notion that sound legal institutions matter for a country's financial system and economic outcomes. Thus, future studies may inculcate the effect of law and legal institutions on economic growth in South Africa.

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Appendix A : Financial Liberalisation Policy Variables

DATE	INTR	EBB	SMR	EC	EAL
1969	0	0.33	0.5	0	0.33
1970	0	0.33	0.5	0	0.33
1971	0	0.5	0.5	0	0.33
1972	0	0.5	0.5	0	0.33
1973	0	0.5	0.5	0	0.33
1974	0	0.5	0.5	0	0.33
1975	0	0.5	0.5	0	0.33
1976	0	0.33	0.5	0	0.33
1977	0	0.33	0.5	0	0.33
1978	0	0.33	0.5	0	0
1979	0	0.33	0.5	0	0
1980	0	0.33	0.5	0	0
1981	0.3	0.33	0.5	0	0.33
1982	0.3	0.33	0.5	0	0.33
1983	0.3	0.33	0.5	0	0.33
1984	0.3	0.33	0.5	0	0.33
1985	0.3	0.33	0.5	0	0
1986	0.5	0.33	0.5	0	0
1987	0.5	0.33	0.5	0	0
1988	0.5	0.33	0.5	0	0
1989	0.5	0.33	0.5	0	0
1990	0.5	0.5	0.5	0	0
1991	0.5	0.5	0.5	0	0
1992	0.5	0.5	0.5	0	0
1993	0.5	0.5	0.5	0.33	0
1994	0.5	0.5	0.5	0.33	0
1995	0.5	0.5	1	0.33	0
1996	0.5	0.66	1	0.5	1
1997	0.5	0.66	1	0.5	1
1998	0.5	0.66	1	0.5	1
1999	1	0.66	1	0.5	1
2000	1	0.66	1	0.5	1
2001	1	0.66	1	0.66	1
2002	1	0.66	1	0.66	1
2003	1	0.66	1	0.66	1
2004	1	0.66	1	0.66	1
2005	1	0.66	1	0.66	1
2006	1	0.66	1	0.66	1
2007	1	0.66	1	0.66	1
2008	1	0.66	1	0.66	1
2009	1	0.66	1	0.66	1

APPENDIX B

Variance Decomposition of LGDP:

Period	S.E.	LGDP	FD	FLIBINDEX	INTR	LCPI	LDCE	LGVTDBT	LINV	LJSETURN	LM2	LSAVINGS
1	0.014151	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.022115	54.52552	0.027624	10.65710	22.99198	0.040996	0.016461	0.015206	0.108408	8.569979	2.433510	0.154140
3	0.034347	31.57975	4.205677	8.473060	33.59288	2.989319	0.232996	0.885286	0.116303	16.06032	1.019890	0.524631
4	0.045593	28.44241	7.590536	7.946334	34.05658	7.810466	0.281715	3.419567	0.115806	9.123656	0.588452	0.442347
5	0.054714	28.48154	10.23896	6.027609	30.63851	10.13326	0.203575	5.001997	0.100104	8.169727	0.477483	0.395507
6	0.060473	31.19866	12.25659	4.943279	26.58316	9.266915	0.291949	5.745658	0.082232	8.578543	0.618953	0.324880
7	0.063636	34.90317	11.99535	4.755503	24.31303	8.605528	0.374679	5.765704	0.076626	8.156548	0.575859	0.368650
8	0.066333	37.48065	11.03988	4.527002	22.97803	8.357893	0.354115	5.520411	0.075506	7.551551	1.341966	0.644687
9	0.070072	36.99835	10.12833	4.069435	22.80568	8.698878	0.345386	5.039617	0.111401	7.145405	3.214696	1.268742
10	0.074996	34.21263	8.862406	4.068923	25.00552	9.510757	0.423100	4.498069	0.211254	6.433192	4.705809	1.832460

Variance Decomposition of FD:

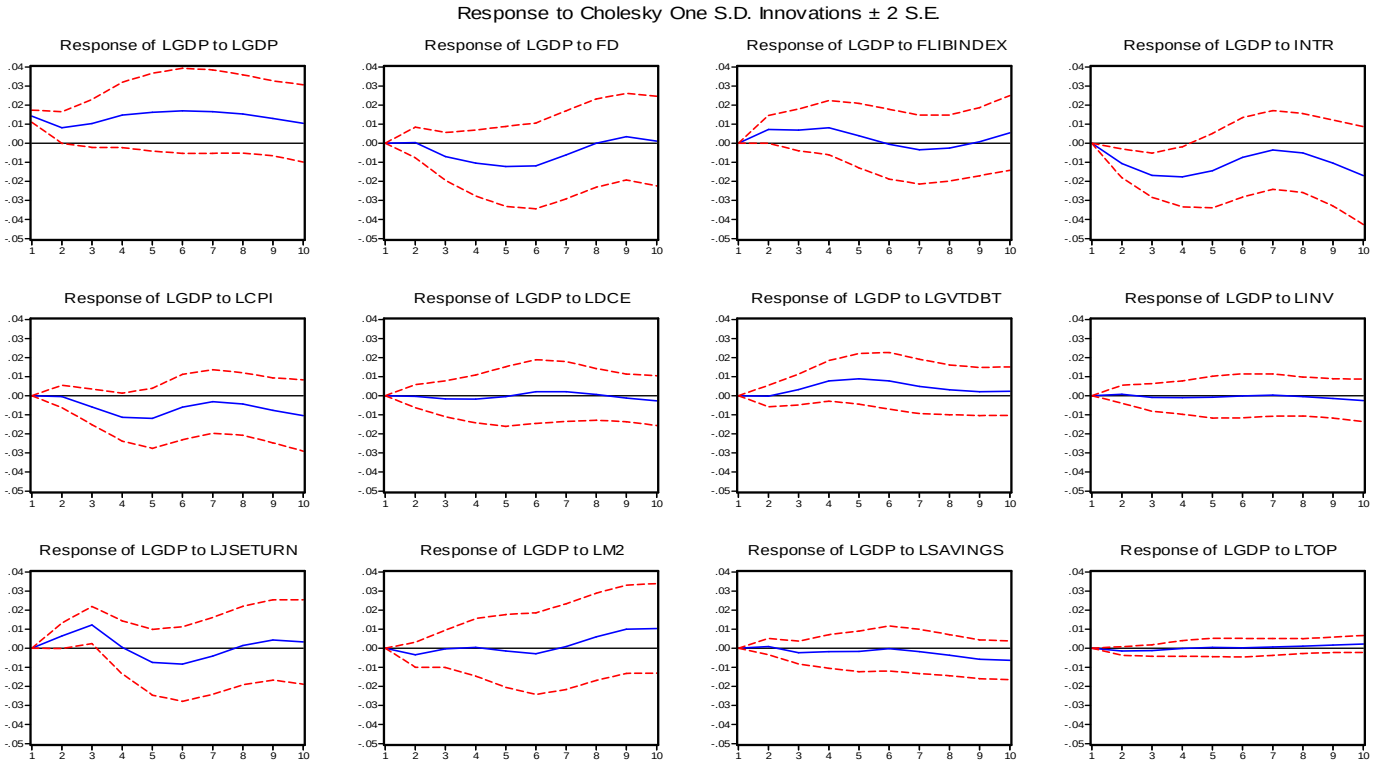
Period	S.E.	LGDP	FD	FLIBINDEX	INTR	LCPI	LDCE	LGVTDBT	LINV	LJSETURN	LM2	LSAVINGS
1	1.878760	0.127408	99.87259	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	2.813470	3.546690	45.50556	6.726924	3.413749	2.044235	1.796977	2.565355	0.032980	33.64617	0.018270	0.565955
3	3.430535	2.406115	31.48588	12.72497	18.07113	6.537231	1.942736	2.557443	0.111136	23.25684	0.107276	0.561358
4	3.906736	2.463519	33.11488	10.20558	15.39394	8.177131	1.512765	4.220590	0.248172	23.32985	0.663094	0.461167
5	4.388119	2.697360	30.73047	8.500604	12.80856	6.484884	1.763407	4.732523	0.230883	25.75694	5.199301	0.918954
6	4.785007	2.892855	26.25632	9.713088	15.95412	7.288651	2.257121	3.985377	0.528284	23.52785	6.186785	1.217738
7	5.019314	2.980295	24.42249	11.12198	18.85218	7.364196	2.079986	3.813921	0.548662	21.87532	5.656841	1.106791
8	5.192426	2.881429	26.25734	10.73087	18.08122	6.883324	1.950582	3.753461	0.530089	21.45018	6.184626	1.131114
9	5.359867	2.737134	26.06453	10.30905	17.90336	7.138204	2.036904	3.691456	0.506414	21.28034	6.877827	1.292417
10	5.528000	2.642320	24.54155	11.00499	19.93715	7.631183	2.235125	3.482362	0.508095	20.02666	6.561948	1.269883

Variance Decomposition of FLIBINDEX

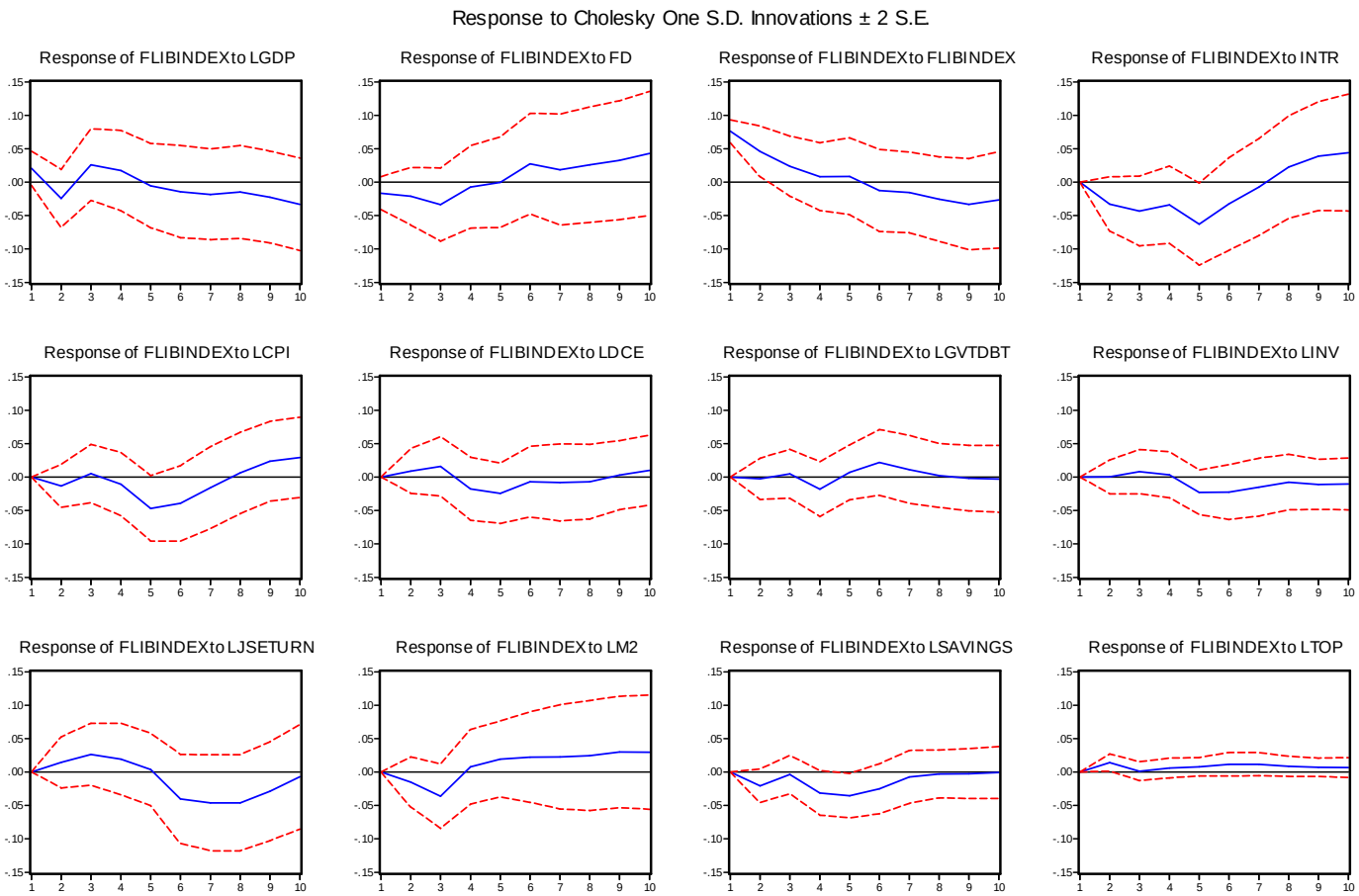
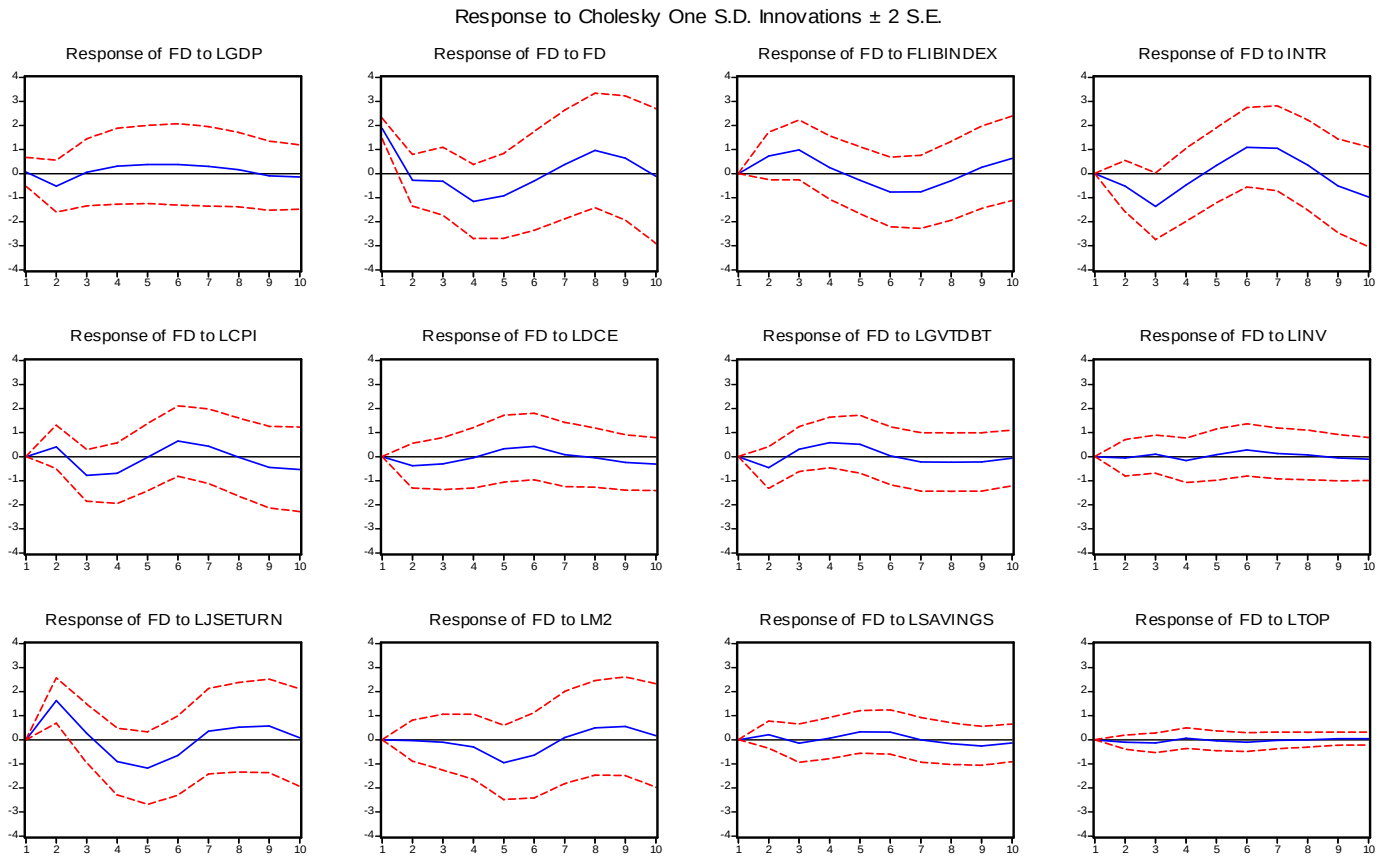
Period	S.E.	LGDP	FD	FLIBINDEX	INTR	LCPI	LDCE	LGVTDBT	LINV	LJSETURN	LM2	LSAVINGS
1	0.080576	6.628168	4.175394	89.19644	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.109777	8.523495	5.996602	65.59174	8.927005	1.485281	0.668901	0.059028	0.000385	1.690343	1.867600	3.566428
3	0.136659	9.129124	9.901109	45.36024	15.73351	1.103414	1.779615	0.156333	0.352874	4.808154	8.239701	2.380850
4	0.149824	8.914738	8.477810	38.03424	18.19419	1.425864	2.866724	1.604360	0.340617	5.635360	7.118380	6.360009
5	0.177688	6.434995	6.027611	27.27914	25.43088	7.963249	3.907641	1.294615	1.899071	4.048701	6.254745	8.533568
6	0.198050	5.698964	6.781793	22.36078	23.19088	10.36401	3.271001	2.251300	2.828629	7.403724	6.280331	8.488797
7	0.209072	5.882335	6.877747	20.61304	20.93368	9.880480	3.088093	2.308787	3.063618	11.52269	6.805985	7.744086
8	0.220717	5.727647	7.566838	19.82549	19.81517	8.942592	2.871821	2.080592	2.870070	14.69271	7.347126	6.965687
9	0.235273	5.947186	8.595367	19.42894	20.14741	8.872159	2.541746	1.836387	2.751922	14.43103	8.073391	6.143646
10	0.251041	6.987180	10.47938	18.18643	20.79413	9.161368	2.394347	1.626081	2.587705	12.75698	8.481712	5.396957

APPENDIX C: IMPULSE RESPONSE FUNCRIONS

IMPULSE RESPONSE OF LGDP



IMPULSE RESPONSE OF FLIBINDEX



IMPULSE RESPONSE OF FD