

The Relationship between Financial System Development and Economic Growth in the Egyptian Economy

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The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

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*To the most respected and honourable **Prophet Muhammad**
(peace and blessings be upon him)*

... & to my parents and every member of my family

Acknowledgment

My utmost thanks to Allah Almighty who gave me the grace, ability and strength to embark upon and complete my PhD. I praise Him and glorify Him as He ought to be praised and glorified. I pray for peace and blessings upon all His noble messengers and the last Prophet Muhammad (PBUH) who was sent as a blessing and mercy for all mankind and all the universes.

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Abstract

Over the recent decades, there have been extensive theoretical and empirical debates on the relationship between finance and growth. However, the empirical results are ambiguous and vary according to the measures of financial development; function form; estimation method; and data frequency. Therefore, by using different time series techniques, this thesis investigated three different aspects but, nevertheless, interrelated dimensions of the finance-growth nexus in developing countries and, particularly, in the case of Egypt. Firstly, by using a Vector Error Correction Model (VECM) in which the banking sector and the stock market were modelled explicitly and simultaneously, we investigated the relationship and causality direction between financial development and economic growth. The co-integrating vector showed that, rather than the banking sector, stock market development was more conducive to a higher rate of growth. Moreover, the causality pattern showed that, whilst, in the long-run, there was a consistent causality pattern which supported the demand-following view, in the short-run, the causality pattern provided mixed results. Secondly, based on McKinnon's complementary hypothesis, we investigated the long-run and short-run association between financial liberalisation; financial development; interest rate behaviour; and savings and investment. On the one hand, the empirical findings indicated that McKinnon's complementary hypothesis did not hold in the case of Egypt and, on the other hand, financial development led to larger financial systems which contributed positively to savings; investment; and economic growth. However, financial liberalisation had an adverse effect on savings and investment.

Finally, we evaluated the validity of the new structuralism hypothesis highlighting a dynamic relationship between country's financial structure and the phase of economic development. The main findings confirmed the new structuralism hypothesis. Financial structure is dynamic and determined endogenously by the demands from the real economy for specific types of financial services. Consequently, particular types of financial system structures exist and are more effective than others in managing particular types of risk; matching savings with investment; promoting efficient allocation of resources; and spurring economic growth at particular points of time and stages of economic development. In the early stages of economic development, both the banks and the stock market are important. However, as the economic development advances, the stock market's importance, relative to banking system, becomes more significant. Accordingly, the primary policy implication is that future financial policies should strengthen the legal and institutional environment. This would enhance operational efficiency in the financial system and the allocation of capital resources. On the other hand, Policy-makers should encourage economic policies that repress the demand for money and speculation activities. In turn, these would spur investment and the rate of economic growth. Furthermore, when designing the appropriate financial policy, policy-makers should take into consideration the level of economic development and the structure of the real economy since certain types of financial institutions and arrangements are better than others in serving particular industries.

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1 Introduction

1.1 Motivation of Research

Over the last four decades, the relationship between finance and economic growth has received considerable attention. The theoretical foundation of the relationship between finance and growth goes back to Adam Smith who stated that “the trade of the city of Glasgow, doubled in about fifteen years after the first erection of the banks there; and the trade of Scotland has more than quadrupled since the first erection of the two public banks at Edinburgh” (Smith, 1776, p. 315). Moreover, Schumpeter (1911) highlighted the importance of the banking system and financial intermediaries in economic growth and the circumstances when financial markets could stimulate capital accumulation and future growth through funding innovations and productive investments. In addition, Robinson (1952) suggested that, as the real economy grew, more financial services and institutions arose in order to satisfy the demand for financial services. Namely, financial development follows economic growth.

Since then, the relationship between financial development and economic growth has gained more attention in the literature. Over the last four decades, one key apparent aspect of financial sector development, in the world economy, is financial liberalisation which, definitely, can affect the rate of economic growth. However, a convincing theoretical framework for the financial liberalization thesis was lacking until the publications of McKinnon (1973) and Shaw (1973), which provided a concrete theoretical framework to the link between financial liberalization and economic growth. According to the McKinnon and Shaw thesis, higher interest rates, resulting from financial liberalization policies, induce households to increase their savings. On the one hand, these policies encourage and boost the financial intermediation process and, on the other hand, they accelerate the supply of loanable funds available to the private sector. In turn, this has a positive impact on the level of investment; the efficient allocation of capital resources and, hence, economic growth.

As a result, from the early 1970s, there emerged a wave of financial liberalisation programmes; often, these were justified by appealing to the McKinnon-Shaw hypothesis. These policies were implemented not only in developed countries but, also, spread into emerging and developing countries. Since the domestic financial system plays a significant role in financing investment and, hence, promoting economic growth, it is

argued that developing countries should restructure their economies and move to market-oriented systems in which the financial sectors become more developed and fully liberalised in order to catch-up with advanced economies and to achieve rapid growth. These policies were intended particularly to raise financial system efficiency through liberalising the rate of interest and allocating credit efficiently to the most promising projects. A well-functioning domestic financial system accelerates economic growth through mobilising savings; allocating these savings efficiently into the most productive projects; providing diversifications of risk; and easing the flow of trade inside the economy.

Furthermore, another strand of the literature emphasised the importance of financial and technological innovations brought about by financial liberalisation and its positive impact on economic growth. However, if the economy enjoys a high level of financial innovation, coupled with more deregulated financial system, the impact of financial innovation on economic growth may be ambiguous and quite complex to predict. Moreover, the current financial crisis shed light on the adverse effect of an unregulated and unmonitored financial system on economic growth. An unregulated financial system is more likely to cause greater financing and financial fragility which lead to a financial crisis.

Therefore, based on the above discussion, it is of paramount importance to investigate the effect of financial development and, in particular, financial liberalisation programme on the economic growth in order to find out whether financial liberalisation policies are successful in achieving the expected results. Particularly, in recent years, there has been extensive theoretical and empirical debate on the role of finance in promoting economic growth. However, conflicting results, from various empirical studies at different levels, country group and specific country studies, using several econometric techniques could not help to reach a concrete conclusion. Indeed, the empirical results are ambiguous and vary according to the choice of financial variables; function form; estimation method; and data frequency (Khan and Senhadji, 2003, Kar and Pentecost, 2000b). In addition, these theoretical and empirical debates indicate not only that there is no agreement on the role of finance in economic growth but, also, that there is no agreement on the direction of the causality between finance and growth.

My research investigates the interrelationship between finance and growth in the case of Egypt. The importance of this study came from its focus on one of the major problems facing the Egyptian economy. This is the low level and growth rate of investment and, hence, the rate of economic growth which is the case for most of developing countries, in particular, the Middle East and North Africa (MENA region). However, investment has to be financed and herein lies the importance of the financial sector development. Furthermore, in the case of Egypt, this study was motivated by the lack of theoretical and empirical studies which investigate in depth and extensively different aspects of the interrelationship between finance and growth.

Like many other developing countries, Egypt implemented an extensive wave of economic reforms and, in particular, financial sector liberalisation with the expectation that, through promoting savings and investment, financial liberalisation policies would enhance the economic growth. In order to achieve rapid growth, the Egyptian government embarked on continuous financial development and liberalisation programmes which the World Bank (WB) and International Monetary Fund (IMF) prescribed at the onset of the 1990s.

This study considers a specific example of a developing country, namely Egypt. The argument, in favour of focusing on Egypt as a case study, is that Egypt is an interesting example which has promoted financial development and implemented a wide range of financial liberalisation measures. These resulted in changes in macroeconomic policies which reflected a shift from a state-dominated economy to a more market-oriented economy. However, it was observed that the shift from a financially repressive regime to a more liberalised financial system was relatively smooth whereby the programme of financial reforms was implemented gradually in a series of steps. Therefore, it did not lead to any major financial crisis which was significant enough to have a serious effect on the economy. This experience shows that in order to avoid a financial crisis the financial liberalisation programme should be implementation gradually according to a well-timed deregulation process in order to allow the economy some time to adopt and respond to the policy changes.

1.2 Objective of Thesis

The study's main objective is to examine, by using different time series techniques over the period from 1980 to 2011, the relationship between finance and growth in

developing countries and, in particular, in the case of Egypt. To this end, the relationship between finance and growth has been considered from different theoretical perspectives. Different schools of thought have different views regarding the link between financial development and economic growth and, in particular, the role of money in the economy. Another important aspect of the finance-growth nexus is the relationship between saving and investment which has significant implications for the role of the financial system in the economy.

More precisely, in order to address the main research question, the thesis investigates three different aspects but, nevertheless, interrelated dimensions of the finance-growth nexus. Specifically, this thesis aims to investigate, in the case of Egypt, the relationship and the direction of causality between financial development and economic growth. Moreover, the thesis extends the analysis of finance-growth by examining empirically, in the Egyptian context, whether or not financial liberalization has a positive impact on savings; investment; and economic performance. In other words, the study investigates the validity of McKinnon's complementary hypothesis. Finally, by exploring the relationship between financial structure and economic development in the context of the new structuralism hypothesis, the study inspects another key aspect of the relationship between finance and growth. In particular, the thesis investigates whether financial structure is stable or dynamic and determined endogenously by the demand from the real economy for specific types of financial services which change in response to different stages of economic development. Then, these objectives are broken down into several testable hypotheses which are assessed empirically in later chapters.

In summary, the main research questions, addressed in this thesis, are:

(i) What is the relationship between financial development and economic growth?

Also, does the causal relationship run from financial development to economic growth and/or does it run from economic growth to financial development?

(ii) Do financial liberalisation policies have a positive impact on savings and investment? Also, does McKinnon's complementary hypothesis hold in the case of Egypt?

(iii) What is the relationship between financial structure and economic growth? Also, is the financial structure stable or dynamic and determined endogenously by the level of economic development?

1.3 Research Methodology

The thesis aims to investigate, from different perspectives, the link between finance and growth. The methodological and analytical approaches, used in the thesis, are drawn from the finance-growth literature. On the one hand, this study assesses and analyses critically the literature on finance and growth. Furthermore, the study utilises some descriptive analysis to investigate the development of the Egyptian financial system during the period of securitisation.

On the other hand, by using secondary data collected from various international and domestic institutions, this study involves quantitative research including econometric modelling. Therefore, in order to analyse empirically different aspects of the relationship between finance and growth and investigate different hypotheses, the study utilises three prominent econometric techniques. These are, namely, the Co-integration and Vector Error Correction Model (VECM); the Autoregressive Distributed Lag (ARDL); and the Non-linear ARDL approach. Each technique was chosen based on its appropriate, efficient ability to test a specific hypothesis.

Specifically, the thesis employs a VECM approach to examine the relationship and the causality pattern between finance and growth. Then, an Autoregressive Distributed lag (ARDL) technique is employed to evaluate the validity of McKinnon's complementary hypothesis and to explore the channels through which financial liberalisation affects the economic growth. Finally, using a non-linear ARDL approach, the thesis investigates the validity of the new structuralism hypothesis which highlights the relationship between financial structure and economic development.

1.4 Structure of Thesis

The sequence of the thesis is as follows. Firstly, I consider the general issues about financial development and economic growth and, following on from that, I consider these particular aspects of financial liberalisation; their effects and, then, the financial structure. To some degree, financial development was connected and related to the financial repression and financial liberalisation literatures as in McKinnon and Shaw. This is on the basis that financial liberalisation or the removal of financial repression can be one way by which the development of the financial sector can affect the rate of economic growth. Hence, after considering the financial development, I move on to the

financial liberalisation which is considered to be a particular form of financial development. Then, there is another related issue which is the effect of the financial structure which is considered, also, to be another aspect of financial development. In the light of the rapid growth of financial markets since 1980s and, over the last four decades, their intermediation role increased as a new element of the financial system's components which provided different financial services from those provided by the banking systems. This is particularly so in developing and emerging countries such as Asian financial markets and MENA region. A large body of literature indicated that, as the economic development took place and the economy grew, the financial market tended to grow faster than the banking sector as a percentage of the overall financial system.

This thesis is organised into the following nine chapters. The first chapter sets the tone of the thesis and provides an overview of my motivation for the thesis. Then, the thesis' objectives and research methodology are discussed followed by the structure of the thesis.

The second chapter reviews different schools of thought which have different views of the relationship between finance and growth. This chapter considers the early arguments about financial intermediation and economic growth in both Keynesian and neoclassical theories. Then, it focuses on the debate about the relative merits of the theses concerned with financial repression and financial liberalisation. This is followed by criticisms of the financial liberalisation hypothesis represented by the post-Keynesian and neo-structuralist economists. Finally, this chapter considers financial development in the context of an endogenous growth theory.

Chapters three and four review the empirical literature on two different aspects of the finance and growth nexus. The purpose of chapter three is to analyse, in the context of the endogenous growth theory, the functional approach and key channels through which financial development can affect the rate of economic growth. Then, the subsequent section examines theoretically and empirically the possible directions of causality between financial development and economic growth. This is followed by a literature review on the relationship between financial development and economic growth.

Similarly, chapter four assesses empirically and theoretically the competing views in the literature on the financial structure and economic development. Generally speaking, the

literature acknowledged five competing theories. These are, namely: the bank-based view; the market-based view; the financial services view; the law and finance view; and, finally, the new structuralism view.

Chapter five assesses analytically the evolution and the nature of the financial sector development in Egypt during the period under consideration when different financial programmes were implemented. To this end, this chapter investigates the motivations for financial reform and the development of the Egyptian financial sector under both the financial repression system and the financial liberalisation programme. In particular, the chapter focuses on financial regulation and policies. These were followed through the implementation of the Economy Reform and Structural Adaptation Program (ERSAP) prescribed by the World Bank and the International Monetary Fund and how, in managing the Egyptian economy, these new trends affected the financial system and the macroeconomic performance.

The next three chapters present the empirical analysis conducted in the thesis and form the core of the study. These empirical chapters examine different aspects of the interrelationship between finance and growth. In particular, chapter six, the first empirical chapter, examines the relationship between financial development and economic growth. This was done by using a Co-integration and Vector Error Correction Model (VECM) in which the banking sector and the stock market were modelled explicitly and simultaneously in order to determine which one is more beneficial and more conducive to economic growth. Subsequently, on the basis of the error correction model, the Granger causality test was applied in order to examine, in both the short-run and the long-run, the causality pattern between the rate of economic growth; the development of the banking system; and the development of the stock market.

Following on from the results in chapter six, chapter seven, the second empirical chapter extends the analysis by assessing the financial liberalization hypothesis from different perspectives. Specifically, this chapter investigates the long-run and short-run association between financial liberalisation; financial development; interest rate behaviour; and savings and investment. To this end, this chapter consists of two major parts. The first part reviews the utilised econometric methodology, namely, the Bounds co-integration test and the ARDL approach. On the other hand, the second part examines empirically the impact of financial liberalisation on savings and investment

and, hence, Egypt's rate of economic growth. In other words, by using an extensive data set and bounds co-integration test within an ARDL framework, this chapter investigates the validity of McKinnon's complementary hypothesis.

Chapter eight evaluates the validity of the new structuralism hypothesis highlighting a dynamic relationship between country's financial structure and the phase of economic development. Generally speaking, this chapter consists of two intrinsic sections. The first part introduces the most recent technique of threshold regression, namely, a Non-linear ARDL model, as advanced by Shin et al. (2011), along with data sources and variables construction. The second part aims to test empirically the validity of the proposition advanced by the new structuralism and whether or not this argument matches easily with the Egyptian experience.

The thesis ends, in chapter nine, with a conclusion and final remarks. The chapter begins with a summary of the main empirical findings obtained from the empirical chapters and is followed by the thesis contributions to the existing literature. Next, there is a discussion of the policy implications and recommendations derived from the empirical findings. Finally, the chapter presents the limitations of the thesis and some suggestions for future research on the issue of finance and growth.

2 Literature Review of Finance and Growth: Theoretical Background

2.1 Introduction

The purpose of this chapter is to consider, from different theoretical perspectives, the relationship between finance and growth. Different schools of thoughts have different views regarding the linkages between financial development and economic growth and, in particular, the role of finance and money in the economy. Another important aspect of the finance-growth nexus is the relationship between saving and investment which has significant implications on the role of financial system in the economy.

The mainstream approach argues that saving creates investment; the economy operates at full employment; and that the capital-labour ratio is set by relative prices. Therefore, the financial system's main function is to ensure that all savings flow into capital formation and it is assumed implicitly that the allocation of capital is undertaken efficiently. Consequently, the neoclassical model has two fundamental implications. Firstly, the nature rate of growth equals the growth rate of the labour force plus the technical progress. Hence, the nature rate of growth is determined exogenously. Secondly, saving smoothly flows into investment. Therefore, higher saving does not affect the rate of natural growth but does affect the capital-labour ratio and the level of output.

In contrast, the Keynesian approach, based on the assumptions that investment creates saving, stresses the importance of the aggregate demand as a key determinant for the level of economic activity and the rate of long-run economic growth. Higher investment stimulates the level of output and economic growth and leads to more savings. However, investment needs to be financed. Accordingly, the financial system's main contribution is seen to be the creation of credit rather than facilitating the intermediation process between saving and investment.

The monetary theories, presented by Post-Keynesian and Neo-structuralist economists which appeared from the onset of World War II, emphasise the role of money within the economy. Hence, money is not neutral and it plays a key role in financing physical capital and the real economy. Therefore, these economists presented financial-growth models in which credit and credit expansion was necessary always to permit higher

aggregate demand and specifically investment. In turn, these factors affect positively the real output; economic activities; and the rate of economic growth.

A new wave of growth theories, Endogenous Growth Theory, emerged in mid-1980s. This Theory considers the rate of economic growth as an endogenous outcome to the economic activities. The long-run rate of economic growth is affected by education and human capital formation; technological improvements; financial policies; financial structure; and institutional arrangements. Thereby, either financial development can impact directly on the rate of economic growth through financing investment or indirectly through stimulating the technical innovations.

Based on the previous discussion, this chapter's main objective is to present different schools of thoughts which have different views of the relationship between money and economic development. In doing so, this chapter is organised as follows. The next section presents Keynes' approach. Then, there is a discussion of Tobin's model and Gurley and Shaw's model both of which emphasise the role of money on economic activities. Then, in addition to the financial liberalization thesis and its theoretical extensions, the section considers the causes and effects of financial repression policies implemented in developing countries. The review of the theoretical literature progresses by considering some criticism by both Post-Keynesian and Neo-structuralist economists of the financial liberalization thesis. Thereafter, the chapter investigates endogenous financial-growth models before ending with the concluding remarks.

2.2 Money in the Keynesian Theory

Starting with the Keynesian theory this section explores money's role in economic development. Keynes (1936) indicated that, as a result of price and wage rigidity, the neoclassical mechanism would be unable to secure the economic equilibrium at the level of full-employment. Keynes went even further than that and argued that free market economies, where wages and prices are completely flexible, would not be able to solve the problems of endogenous instability and underemployment where the latter might be even worse than would be with price and wage rigidity. Furthermore, he pointed out that, rather than the rate of interest, income was the main driving force for saving. In this case, due to the liquidity trap, an increased saving rate does not lead to higher investment since the demand for money is more likely to be perfectly inelastic

with respect to interest rate changes. Consequently, the economy will achieve equilibrium with a high level of unemployment.

According to Keynes's demand for money balances, there are three key motivations for holding money. These are transactions motive; precautionary motive; and the speculative motive which arose from the individual's desire to maximise their wealth based on the assumption that individuals allocate their wealth between holding money and government bonds which yield fixed dividends. Hence, the government bonds' market price is related inversely to the market's interest rate. A fall in interest rate stimulates individuals and economic agents to increase their money holdings rather than bonds since, in the future, they expect a higher rate of interest leading to a drop in the bonds' market price. This causes capital losses in the values of financial assets.

A lower rate of interest stimulates individuals to hold their wealth in the form of speculative money balances rather than bonds and financial assets. The liquidity trap defines the minimum rate of interest at which the demand for money becomes perfectly interest elastic and, hence, the monetary expansion, through money supply changes, has no effect on equilibrium rate of interest and, consequently, on investment and the level of output. At the liquidity trap, the rate of interest is higher than the corresponding rate of interest at full-capacity. This induces individuals to increase their money holdings at the expense of productive investment leading to lower levels of capital accumulation and investment. Consequently, planned saving exceeds planned investment whereby the level of planned investment is determined by animal spirit; marginal efficiency of capital; and the demand factor where there is little role for interest rates to play. On the other hand, planned saving depends mainly on the level of income.

Keynes (1936) pointed out that, historically, the interest rate tended to be higher than the level which would be its equilibrium level at full employment and this led to lower investment and output. Therefore, for the Keynesian model, the policy implication is to change the relative returns on money and financial assets. Expansionary monetary policy satisfies the liquidity preference and, in the meantime, reduces the rate of interest which stimulates investment and output levels. "Another strategy is to discourage the demand for liquidity by raising the opportunity cost of holding money without raising the interest rate ...[through]... stamp tax on money" (Fry, 1995, P. 12).

2.3 Tobin's Model: Money in the Neoclassical Theory

The neoclassical theory assumes that saving generates investment and that savings flow smoothly into investment and capital formation. This means that supply creates its own demand (Say's law). Therefore, it is assumed that the financial markets operate effectively to ensure that all savings flow into capital formation and it is assumed implicitly that the allocation of capital is undertaken efficiently. However, due to the neoclassical assumption of diminishing returns to capital leaving the long-run rate of growth unchanged, an increase in the savings rate is offset by an increase in the capital-output ratio. This is because the rate of steady-state growth depends on two factors, growth of the labour force and the growth of labour productivity. These two factors are determined exogenously and, therefore, the rate of steady-state growth rate is, also, exogenous (Palley, 2002).

The starting point, for the relationship between financial development and economic growth, goes back to Schumpeter (1911); Gurley and Shaw (1955, 1960); and Tobin (1965) who emphasised the role of money on economic activities. Many attempts were made to introduce money into the neoclassical growth theory. Tobin's model is one of the earlier models; through using the neoclassical (Solow, 1956) growth model, it incorporates money into the general equilibrium macro-framework in order to show the effect of money on economic growth. However, the Tobin model treats money as a stock of asset and unrelated to the financing of investment or the creation of the credit process.

In the neoclassical model, all saving is invested. Therefore, physical capital accumulation is the only form of wealth. However, in Tobin's model with its two-asset portfolio, money is treated as a durable asset which yields a flow of services to money-holders; this may be considered to be a rate of return from holding money. Hence, households can allocate their wealth between two different types of assets, money and physical capital. Consequently, the demand for money is related inversely to the opportunity cost of holding money (the nominal rate of return which can be obtained from physical capital that equals the real return on physical capital plus the rate of inflation).

Based on the assumption of perfect financial markets in which money is treated as a form of wealth that competes with other forms of financial assets in household

portfolios. Accordingly, the neoclassical demand for the real money function can be written as follows:

$$\frac{M_d}{P} = H(Y, r, d - \pi^e) \quad (2.1)$$

Where:	Y	Real income (GDP)
	r	real rate of return on physical capital
	$d - \pi^e$	Real rate of return on money (measured as nominal interest rate on bank deposits minus expected inflation rate)

Hence, with a given amount of savings, there exists a substitution relationship between real money balances and capital accumulations ($H_r < 0$). An increase, in the real return on money, stimulates the demand for real money balances which, in turn, deters the capital accumulation process and the level of investment. Contrary, an increase in capital returns relative to money returns induces households to increase the ratio of capital to money in their portfolios (more capital accumulation). In turn, this raises the capital-labour ratio and labour productivity. This effect leads to an increase in per capita income and, hence because of a decline in the relative return on money, a greater rate of economic growth in the short-run during the transition process from a lower capital-labour ratio to a higher capital-labour ratio.

To this end, a reduction in money return can be achieved through different ways such as reducing the deposit rates of interest or raising the growth rate of money stock and, thereby, increasing the rate of inflation. In other words, Tobin's model assumes that there is a positive relationship between inflation and economic growth.

In summary, improving capital accumulation can be achieved by lowering the rate of return in holding money, the interest rate on deposits, through the rate of inflation, leading. In the short-run, to a higher rate of economic growth is the so-called "Tobin effect" (Tobin, 1965, Fry, 1995). However, based on Solow's neoclassical growth model, the rate of long-run economic growth rate remains constant.

In contrast, Lee (1980) modified the households' portfolio allocation in Tobin's model by substituting inside money for outside money and irreproducible assets which were

held as inflation hedges for productive capital¹. He concluded that, due to a higher rate of inflation or monetary growth, a lower relative return on money would increase the rate of inflation and would reduce the real demand for money. Thereby, this would impede investment and economic growth through reducing the available funds to finance productive investment projects.

In summary, Tobin's model gives ambiguous results since the effect of money on economic growth varies according to households' choices between inside money; outside money; inflation hedges; and productive capital.

2.4 Gurley and Shaw Model

Gurley and Shaw (1960) argued that saving deposits issued by different types of financial institutions and intermediaries were very close and similar to money-deposits issued by commercial banks. Therefore, saving deposits are to be considered as liquid assets and classified as near-monies since, at any time, they can be converted into cash or cheque account deposits. However, the central bank does not control near-monies and saving deposits and, thereby, this lack of control weakens the operation of monetary policy. If the central bank decided to implement a more restrictive monetary policy in order to reduce liquidity and money supply, this policy would be ineffective since, at any time, near-monies could be transformed into cash or cheque account.

Gurley and Shaw's model postulated three different stages for financial development through the process of economic development. In the first stage, with the exception of outside money (fiat money), the economy has no financial asset. This impedes savings; capital accumulation; and efficient allocation of savings to productive investment.

In the second stage, as the economy develops, new types of financial assets emerge. These are inside money; direct claims such as equities and bonds; and indirect claims

¹ There are two types of money which serve primarily as a medium of exchange. Money such as bank deposits, which is backed by private sector loans and credit, is defined as inside money. Therefore, bank deposits exist as a result of the credit creation process. In other words, loans create bank deposits whereby banks can create these new loans independent of their reserves held at the central bank. On the other hand, outside money is money created outside the private sector. This includes government fiat money (cash notes and coins) and bank reserves which are considered to be the most important form of outside money (deposits held as reserves at the central banks). These bank reserves are held for two reasons: to satisfy reserve requirements; and to settle payments amongst banks in the interbank market. For further details, see (Ghatak, 1995, Fry, 1995).

which contain liabilities issued by financial institutions. For instance, these are deposit liabilities which are considered to be the most important sources to finance industrial sector.

In the third stage, the most important features are diversification; proliferation of different financial claims issued by financial and non-financial institutions; and the evolution of financial techniques from face-to-face loans to distributive techniques and intermediary techniques. These expand the financial market; increase market efficiency; and provide benefits for both borrowers and lenders (Fry, 1995).

As Gurley and Shaw asserted, whilst economic development takes place, it appears as though there is a positive relationship between economic growth and financial accumulation. This is because as per capita income rises, the growth rate of financial assets (for instance, intangible claims such as primary securities and indirect securities) turns out to be higher than the rate of economic growth. This can be explained in two different ways:

- (i) Financial and capital accumulation depends on the degree of specialization and division of labour which, in turn, hinges on real economic development (the growth of real output). Consequently, specialization increases financial accumulation through increasing savings-investment and the efficiency of financial intermediation.
- (ii) Financial and capital accumulation hinges on the expansion of the financial market which depends on increasing the supply of and demand for financial assets- claims. However, supply and demand forces are correlated with the growth of real economic activities (economic development).²

2.5 Financial Repression and a Policy of Low Interest Rates

Keynes's liquidity preferences theory along with Tobin's model formed the rationale for the financial repression policies which were implemented during the 1960s and 1970s. Many developing countries implemented various measures of financial repression policies (such as inflation tax; lower interest rates; directed credit programmes; high

² There are two methods of finance. Firstly, internal finance consists of self-finance and retained earnings. Secondly, external finance includes debt-asset techniques which are considered to be the most important instrument for mobilizing the financial surplus and leading aggregate domestic saving into investment. For further details, see Gurley and Shaw (1967).

reserve requirements; and state-owned financial institutions etc.) in order to promote their capital formation, investment and economic growth rate.³ Based on the assumption that financial repression policies and, in particular, a lower interest rate, which reflects the cost of borrowing/lending, are the main constraint for capital accumulation rather than the availability of loanable funds. Therefore, on the one hand, a lower interest rate promotes investment and economic growth and, on the other hand, fiscal deficits can be funded by a lower rate of interest.

Besides, there are some other factors which provide support to government intervention in both the structure and the mechanisms of financial markets, such as financial market imperfections, budget deficits, limits on fiscal expansion and infant industries protection. To a large extent, most developing countries were suffering from financial market imperfections whereby financial markets were segmented and dominated by a limited number of commercial banks which provided loanable funds mainly to foreign natural resources corporations rather than to the agriculture and domestic industry sectors and, consequently, this constrained investment and economic growth. Furthermore, high margins between deposit and lending rates were charged as a result of the banking sector's oligopolistic structure. Also, a high portion of non-performing loans as credit were granted based on political and personal relationships rather than on risk assessments and, finally, there was the high cost of monitoring and screening existing and potential investors (Killick, 1993).

Budget deficit and limits on fiscal expansion were due to low income tax revenues as a result of low incomes; a high rate of tax evasion and tax avoidance; and the high cost and inefficiency of the tax collection process. Therefore, there was wide acceptance of a low interest rate policy since it allowed governments to:

- (i) Stimulate the economy and establish priority projects by means of a fiscal expansion policy and financing the budget deficits at very low-costs.

³ The government could stimulate the rate of inflation by increasing the money supply. One way of doing this could be through financing their budget deficit by seigniorage. With a fixed nominal interest rate on deposits, a higher rate of inflation reduces the demand for real money balances. Hence, inflation acts as a tax on cash and money balances. Consequently, more resources are available for the government which can be directed to investment in the public sector.

- (ii) Stimulate the level of investment through maintaining a low cost of borrowing which allowed more investment and capital accumulation to take place.

During the 1960s and 1970s, most developing countries adopted the import substitution strategy to mimic the developed countries' economic structures and to develop advanced capital intensive industries. However, these infant industries could not face the worldwide competition. Therefore, on the one hand, governments protected these infant industries by imposing tariffs on similar imports from abroad. These were a major source of government revenues. On the other hand, directed credit programmes were implemented in order to subsidize and support these priority industries. Moreover, after the great depression and collapse of the financial markets in 1930s, there was a consensus that banks were involved in speculative and highly risky activities in order to compensate the high cost (high deposit rate) which resulted from destructive competition in the financial markets (Fisher, 1933). Consequently, there was wide acceptance of imposing interest rate ceilings on banks.

Furthermore, in order for import substitution strategies to be successful, developing countries' governments imposed restrictions on capital flows and overvalued their domestic currencies. These were done to reduce the cost of imported intermediate and technologies goods and, hence, the current account deficit. However, like a double-edged sword, on the one hand, these development strategies cut the cost of imports and, on the other hand, had a negative effect on exports.

In many developing countries, there was a widespread popular acceptance of financial repression policies such as interest rates controls; high reserve requirements; and credit programmes directed to specific growth. These were done in order to finance their public sector and high-priority projects without increasing taxes interest rates, or inflation rates (Ang, 2008). In other words, financial repression economies were characterised by a high proportion of domestic resources and funds being channelled from domestic financial system to the public sector and a reduction in velocity of circulation through various measures such as interest rate ceilings; high reserve requirements; selective and sectorial credit programmes; controlling the foreign exchange rate; and suppression of private capital market. These impeded private sector competition to public sector funding.

However, from a neo-classical point of view, these policies might reduce the household's incentive to hold financial assets which, in turn, reduces the credit available to investment and, hence, reduces economic growth. Consequently, from neo-classical view, financial repression policies were responsible for the major problems and deficiencies in developing economies.

Therefore, from the 1970s, the financial liberalization thesis emerged to solve the problems which arose from financial repression policies. McKinnon and Shaw (1973) argued that, through increasing the allocation efficiency of credit, domestic financial liberalization would increase the quality and quantity of investment. Furthermore, capital account liberalization increases private capital inflow which increases capital accumulation, investment and, hence, the economic growth.

Building on the work of Schumpeter, McKinnon and Shaw (1973) presented a financial liberalization hypothesis. They argued that savings, and investment were repressed by financial repression policies, in the form of interest rate ceilings; high reserve requirements; and government intervention in credit allocation through directed credit programmes. Thereby, for less-developed countries to achieve economic development and catch up with developed countries, the policy has to liberalize interest rates to be determined through market forces; implement privatization; reduce or abolish reserve requirements; and increase competition via financial system liberalization. This increases savings-investment and, hence, encourages the level of output and spurs economic growth which, in turn, increases savings in a virtuous circle. Consequently, financial liberalization assumes a positive relationship between financial development and economic growth with the direction of causality running from financial development to the economic growth (Arestis and Demetriades, 1996).

2.6 Financial Liberalisation Thesis

McKinnon (1973) and Shaw (1973) argued that the financial repression policies, which followed during the 1960s and 1970s, affected savings negatively and resulted in financial markets inefficiencies which had adverse effects on macroeconomic performance. They presented a theoretical framework highlighting financial liberalization's important role as a key factor in promoting financial development; the quantity and the quality of capital accumulation; and growth-enhancing economic

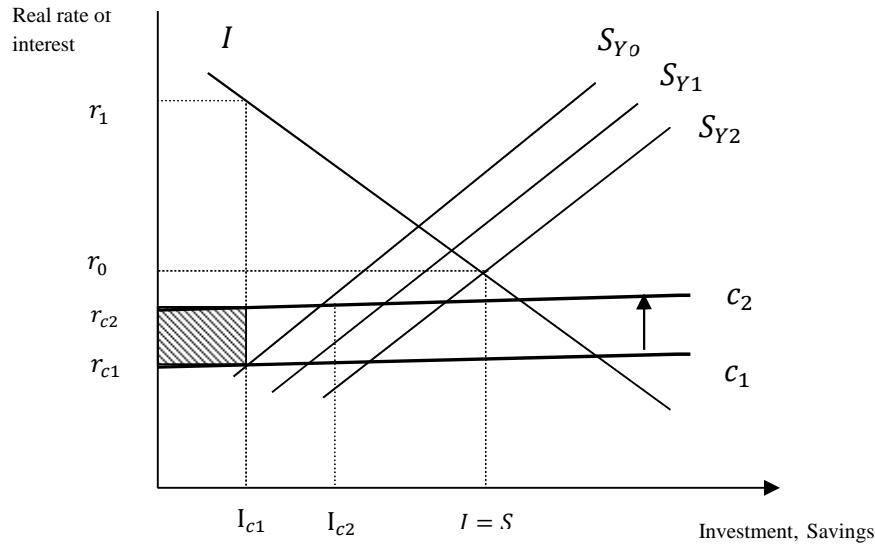
policies. These would spur economic development and, accelerate the rate of economic growth in developing countries.

Although, McKinnon's approach coincides with Shaw's view regarding the positive impact of financial liberalisation on saving, investment and economic growth, they have different transmission mechanisms. McKinnon postulates a complementary relationship between money and physical capital accumulation. This is based on an outside money model which emphasises the significant role of bank deposits in promoting investment projects since, firstly, sufficient deposits have to be accumulated before investment takes place. Due to investment indivisibilities and limitations on self-finance, sufficient real money balances should be accumulated in the form of bank deposits for investment to take place. On the other hand, using an inside money model, Shaw's debt intermediation approach assumes a substitution relationship between money and capital investment. Therefore, a higher rate of interest resulting from financial liberalisation would increase deposits and available loanable funds by financial intermediaries. In turn, this would increase the quantity and the quality of investment. Moreover, Molho (1986) pointed out that McKinnon's complementary hypothesis and Shaw's debt intermediation view were complementary rather than competing "... because most projects are financed in part with own funds and in part with borrowings ... the two views can be integrated without altering their basic conclusions" (Molho, 1986, P. 111).

The McKinnon-Shaw framework indicates that financial repression policies distort financial prices and, in particular, interest rates and foreign exchange rates lead to a reduction in savings and investment. The following diagram illustrates the basic idea for these two models.

Let that $(S_{Y_0}, S_{Y_1}, S_{Y_2}, \dots)$ indicate different saving curves at different income levels (Y_0, Y_1, Y_2, \dots) which exhibit a positive relationship between savings and the real interest rates, whereas investment curve (I) shows an inverse function of the real interest rate (McKinnon, 1973). In a free market without any financial constraints, the equilibrium real interest rate will be (r_0) where investment equals savings $(I = S)$.

Figure 2.1. Saving and Investment under Financial Repression



Source: Fry (1995, P. 24)

Let's assume that the monetary authority applies at (r_{c1}) a financial repression policy such as an interest rate ceiling on deposits which is less than the equilibrium level of the real interest rate (r_0). Lowering the real interest rate would distort the economy and would create the following sequences (Fry, 1995, Fry, 1997):

- (i) A low interest rate induces households to increase their current consumption which may reduce savings below the social optimum level and, hence, reduce the amount of available funds for investment from (I) to (I_{c1}).
- (ii) Borrowers will be able to obtain low cost loanable funds; this may induce them to invest in capital-intensive techniques.
- (iii) Entrepreneurs are encouraged to engage in low-yielding projects which they would not be able to finance at the equilibrium interest rate instead of depositing their money in banks.
- (iv) Credit would be allocated based on non-price criteria such as the quality of the collateral; the borrower's reputation; political pressure; and corruption of credit officers ... etc.
- (v) With a low interest rate ceiling, financial institutions are encouraged to finance low-risk ventures since they are prohibited from charging high interest rates associated with high risk ventures.

Furthermore, since the real interest rate falls due to a reduction in the nominal interest rate or an increase in the rate of inflation, households shift from bank deposits to inflation hedges such as tangible assets. Inflation hedges prices tend to increase relative to the general price level and this leads to an increase in household's wealth-income ratio. This induces households to increase their consumption and, therefore, reduce their savings from their incomes (Fry and Williams, 1984).

Moreover, credit allocation programmes, where financial institutions are obliged to allocate a minimum proportion of their credit to priority sectors selected by government at subsidized loan rates of interest, lead to high delinquency and default rates. These reduce the availability of credit for new investment projects and result in an increasingly fragile financial system.

When monetary authorities decide to ease the financial constraints and increase the real interest rate from (r_{c1}) to (r_{c2}), both savings and investment increase from (I_{c1}) to (I_{c2}). Also, easing financial repression enhances the efficiency of investment by discouraging entrepreneurs from undertaking low-yielding investment projects (shaded area in the figure) and, hence, improves the average productivity of capital in the economy (Dixon, 2000).

This model suggests that an increase to the real interest rate is the key factor to an increased level of investment and improving investment efficiency. In other words, increasing both the quantity and the quality of investment increases the aggregate income of the economy and the savings level. Hence, the saving curve shifts up to the right from (S_{Y_0}) to (S_{Y_1}) leading to an increased level of actual saving and investment.

In this approach, increasing the real interest rate through full financial liberalisation (the abolition of financial repression policies) induces economic agents to increase savings and, hence, to increase the availability of credit. This enables more investment to take place and, in turn, increases the rate of economic growth. In other words, it is assumed that there is positive relationship between savings and availability of credit. Namely, higher saving leads to accumulated bank deposits and, then, banks lend out those deposits for entrepreneurs to finance investment projects. This means that saving creates investment (Say's Law) or deposits create the availability of credit. In contrast, Post-Keynesian economists suggested that, when a firm wished to invest, it approached banks for loans which, when granted, led to bank deposits being created and, therefore,

investment generated savings. This means that deposits are driven by the demand for credit.

2.6.1 McKinnon's Complementary Model

Recently, the theoretical literature (King and Levine, 1993a, King and Levine, 1993b, King and Levine, 1993c) argued that there was a positive correlation between the real interest rate; financial development; and economic growth. As represented by McKinnon (1973), this positive association between financial development and economic growth was based on the complementary hypothesis between money and physical capital accumulation. Where economic agents have no access to external finance, investment is lumpy and restricted to self-finance. For investment to materialise there is a need to accumulate, in the first place, an adequate volume of savings in the form of sufficient bank deposits. This can be achieved through easing financial constraints by means of financial liberalization policies which allow real rates of interest to be determined by the market forces. A positive real rate of interest increases the volume of financial savings mobilisation. In turn, this fosters the rate of economic growth through accelerating physical capital accumulation and the average productivity of capital. On the other hand, a higher real rate of interest discourages investors from undertaking low-return projects which are no longer profitable and, thereby, has a negative impact on the efficiency of investments (Fry, 1997, Levine, 1997).

McKinnon assumes a complementary relationship between money and physical capital accumulation where money is treated as a holding asset related to the financing expenditure rather than the creation of credit. This is in contrast to traditional theories which suppose that there is a substitution relationship between money and physical capital (Ghatak, 1995). This is based on the following assumptions:

- (i) All economic agents have no access to external finance and, therefore, are restricted to self-finance. Investors are not allowed to borrow in order to finance their investment projects.
- (ii) Indivisibilities in investment activities where investment projects are lumpy. Hence, investors must accumulate money balances in the form of financial assets until they have enough amounts to invest before they can begin their investment projects.

(iii) In such circumstances, where total revenues are directed only to cover the government consumption, the government does not contribute to the capital formation process either by fiscal or monetary policies.

McKinnon (1973) argued that, in developing countries where financial markets were fragmented and under developed and governments played little role in capital accumulation, capital accumulation was restricted by the availability of funds rather than the availability of investment opportunities. Therefore, easing financial constraint and/or repression through financial liberalization and allowing real rates of interest to be determined through the market forces increases the real rate of interest. This has a positive impact on savings; the accumulation of physical capital; and the rate of economic growth.

In other words, based on the complementary relationship between real money balances as financial assets and accumulation of physical capital, McKinnon's model tries to analyse the effects of the real deposit rate of interest on savings; investment; and the rate of economic growth. "If the desired rate of capital accumulation (and hence private saving) increases at any given level of income, the average ratio of real cash balances to income will also increase" (McKinnon, 1973). Namely, real money balances have to be accumulated before the formation of physical capital and investment take place.

McKinnon's complementary hypothesis has two dimensions. Firstly, the demand function for real money balances; this represents the key motivations for holding money; the transactions motive represented by the level of income; and the self-finance motive captured by the investment ratio along with real return on money. Hence, the demand for real money function can be written as:

$$\frac{M_d}{P} = F \left(Y, \frac{I}{Y}, R \right) \quad F_Y, F_I, F_R > 0 \quad (2.2)$$

Where the demand for real money balances, $\frac{M_d}{P}$; is correlated positively with real income or GDP (Y); the real interest rate on bank deposit (R) is measured as the nominal interest rate on bank deposits minus the expected inflation rate in the future ($d - \pi^e$); and the ratio of domestic investment to income is $(\frac{I}{Y})$. Secondly, since the complementary hypothesis works both ways and as a result the conditions of real money balances affect investment decisions, investment can be represented as the positive

function in real return on physical capital (r) and the real interest rate on bank deposits (R). Accordingly, the first order partial derivatives of real demand for money and investment functions with respect to their explanatory variables are expected to be positive.

$$\frac{I}{Y} = L(r, R) \quad L_r > 0, L_R > 0 \quad (2.3)$$

On this basis, the complementary hypothesis postulates that, for deposits, the higher real rate of interest increases the demand for real money balances. This is complementary to investment which leads to greater capital accumulation and investment. Therefore, the complementary hypothesis holds true if:

$$F_I > 0 \text{ and } L_R > 0 \quad (2.4)$$

2.6.2 Shaw's Debt-intermediation Model

There is no consensus about the precise definition of financial deepening since different authors have different definitions. The World Bank defines financial deepening as “An increase in the stock of financial assets” (WorldBank, 1989, p. 27). However, Shaw set it as “a process involving specialization in financial functions and institutions through which organized domestic institution and markets relate to foreign markets” (Shaw, 1973, p. 8). According to the literature on finance and growth, financial deepening is measured by the ratio of money supply to GDP. This is based on the idea that the accumulation of saving takes mainly the form of bank deposits. Furthermore, investment projects are funded through banking credit which, in turn, transfers into bank deposits and, hence, increases the total financial assets in the economy. Accordingly, development in financial systems would lead to economic development.

Shaw (1973) developed a monetary model based on inside money and the debt-intermediation view (Gurley and Shaw, 1955, Gurley and Shaw, 1960). This model assumes a positive relationship between the level of per capita income and the degree of financial deepening. According to this view, “expanded financial intermediation between savers and investors resulting from financial liberalization (higher real institutional interest rates) and financial development increases the incentives to save and invest; it also raises the average efficiency of investment”(Fry, 1995, P. 28). Thus, financial intermediaries play an important role in improving both capital accumulation

and the allocation of capital resources which influence positively the real economic activities and economic growth..

Shaw emphasises that saving, investment and financial intermediation are under their optimum level when, using financial repression policies, the real interest rate is set under its equilibrium level. Therefore, ending financial repression and increasing, via financial liberalization and financial development, the real interest rate on deposits provide greater incentives to save; larger loanable funds; and high levels of investment.

In this context, financial intermediaries expansion can offer valuable and important services to the economy through (Fry, 1995):

- (i) Increasing the real rate of return to savers which induces them to increase their savings.
- (ii) Reducing the real borrowing cost to investors by providing liquidity and minimizing risk through diversification and improving the efficiency of the lending process.
- (iii) Promoting operational efficiency by lowering, through financial specialization, the information cost to savers and investors.
- (iv) More effective allocation of capital resources and investment efficiency.

Shaw's model assumes that all forms of wealth yield real returns. This includes money where there is no complementary relationship between money and physical capital, since investors have access to external finance and are not restricted only to self-finance. Consequently, in Shaw's model, the debt-intermediation view is based on inside money which can be represented by the following demand function for money:

$$\left(\frac{M}{P}\right)^d = f\left(\frac{Y}{P}, v, d - \dot{P}^*\right) \quad (2.5)$$

Where: v is the real opportunity cost of holding money. According to the above demand function, both the real income and the real deposit rate of interest have positive effects on the real demand for money. Whilst the real opportunity cost of holding money has a negative effect, holding other variables remains constant.

2.7 The Proponents of Financial Liberalisation Thesis

Both the McKinnon and Shaw models illustrate that financial repression policies affect negatively the mobilisation of savings and investment and, hence, economic growth. It is argued that financial liberalization improves the economic growth by stimulating savings-investment and the efficiency of allocating capital. Therefore, financial liberalization promotes both the quantity and the quality of investment.

Furthermore, using Fisher's two-period analysis (1930) and a neoclassical production function with diminishing marginal returns to capital, McKinnon (1973) pointed out that financial repression, in the form of interest rate ceilings and directed credit programmes, was likely to create economic dualism in developing countries. This is because, in such countries, there is a traditional sector with traditional techniques, low productivity and low incomes compared to the modern sectors with advanced techniques; high productivity; and high incomes. Additionally, there are different abilities to access credit in the market through credit allocation programmes that provide low-cost credit to some sectors whilst ignoring others. These programmes resulted in increases to both investment inefficiency and income inequality.

On the other hand, Krugman (1978) argued that when interest rates were set below their equilibrium rates, financial repression policies caused investment inefficiency and income inequality. However, financial repression is not responsible for the existence of economic dualism. Under financial liberalisation policies and the free market mechanism, both traditional and modern techniques exist and are used to the optimum when all economic agents face identical situations of market borrowing-lending.

In addition, Cho (1984) argued that, as a result of two factors, financial repression, in the form of deposit and loan rate ceilings, worsened the income distribution. Firstly, when interest rates are less than the market equilibrium, the major proportion of economic rent goes to large borrowers at the expense of small lenders. Secondly, using capital-intensive production techniques reduces the demand for labour. Therefore, unskilled labour wages tend to drop leading to more dispersion of wages.

Building on the work of McKinnon and Shaw, the first generation school of financial liberalisation developed a number of financial-growth models. Whereas, Galbis (1977) and Fry (1979, 1980, 1982) allowed the financial conditions to affect the quality of

investment (output/capital ratio). Kapur (1976) and Mathieson (1980) argued that, by holding output-capital ratio constant, financial liberalisation policies had positive effects on the rate of economic growth through increasing solely the quantity of investment. This is based on the following assumptions:

- (i) There is an excess supply of labour in developing countries.
- (ii) Using Harrod-Domar production function: $y = \sigma k$.

Where: y is the real output; σ is output-capital ratio which is constant; and k is the total utilized capital which consists of two components, fixed and working capital.

- (iii) Working capital constitutes the major constraint on the level of output. Therefore, there is always an unutilized proportion of the fixed capital.
- (iv) Utilized fixed capital is combined with working capital in a constant ratio.
- (v) Financial repression can be put into effect through reserve requirements or, for deposits, a fixed real rate of interest under the equilibrium rate. This induces households to hold unproductive inflation hedges rather than holding bank deposits which encumber financing investment and, hence, reduce capital accumulation and the rate of economic growth.

However, some empirical studies (e.g. Fry, 1988, Fry, 1990, Galbis, 1977, McKinnon, 1973, Shaw, 1973) showed that financial liberalization and development had greater effects on output-capital ratio (the quality of investment) rather than on the quantity of investment.

2.7.1 Kapur's Model

Using the McKinnon-Shaw framework, Kapur (1976) developed a mathematical growth model to illustrate the transmission mechanism of financial liberalisation. In this model, working capital is the key channel through which financial liberalisation can affect the rate of economic growth. Based on the following assumptions, bank credit is used to finance new additions to the real working capital and fixed portion of depleted working capital (θ) whilst the remaining portion is self-financed ($1-\theta$). Thereby, Kapur's growth model can be written as:

$$\gamma = \mu \frac{M}{P.Y} \cdot \frac{\sigma q}{(1-\alpha)} - \pi\theta \quad (2.6)$$

Where: γ is the economic growth rate $(\frac{\Delta Y}{Y})$; μ monetary growth rate $(\frac{\Delta M}{M})$, $\frac{M}{P.Y}$ is the inverse of income velocity of circulation; σ is the output/capital ratio; q is the ratio of loans to money stock; α is the utilized fixed capital to total capital ratio; whereas $(1 - \alpha)$ is the proportion of the working capital to total capital and π is the inflation rate. Hence, the rate of economic growth is correlated positively to the rate of monetary growth rate; the output-capital ratio; the banks credit ratio; and the fixed capital to total capital ratio utilised. However, it has a negative relationship with the income velocity of circulation and the rate of inflation. Therefore, the economic growth rate is considered to be a function of the supply of bank credit which is determined by the rate of monetary growth μ ; the ratio of loans to money stock q ; the financing portion of depleted working capital θ ; and the demand for real money balances $(\frac{M}{P})$.

Using Cagan's demand for money model (1956), Kapur presented the following demand for real money function:

$$\frac{M}{P} = Y \cdot e^{a(d-\pi^e)} \quad (2.7)$$

Where: d is the interest rate for deposits, π^e is the expected inflation rate. Dividing both sides of the equation by Y , we get:

$$\frac{M}{P.Y} = e^{a(d-\pi^e)} \quad (2.8)$$

By substituting equation (2.8) in equation (2.6) Kapur's augmented growth model can be rewritten as:

$$\gamma = \mu \frac{\sigma q}{(1-\alpha)} e^{a(d-\pi^e)} - \pi\theta \quad (2.9)$$

Hence, according to Kapur's growth model, financial liberalisation policies enhance the economic growth through:

- (i) Increasing the interest rate of deposits (d) towards the competitive equilibrium level would increase the demand for real money and, hence, the real supply of bank credit. Consequently, this would enhance the accumulation of capital and the rate of economic growth.

- (ii) At any given rate of inflation, the abolition of reserve requirements is likely to maximize the rate of economic growth since a reduction in requirement reserve ratio increases the real supply of bank credit and increases the competitive deposit rate of interest; this increases the real money demand and expands the financial system.

Higher monetary growth rate (μ) can have both positive and negative impacts on the rate of economic growth. An increase in the growth of money increases the flow of bank credit to the real economy; this affects positively the rate of growth. In the meantime, higher monetary growth would produce a fall in the velocity of circulation which, in turn, would stimulate a higher rate of inflation and negatively affect economic growth. Therefore, the exponential function indicates the presence of a unique rate of monetary growth (μ) which maximizes the rate of economic growth (γ).

2.7.2 Galbis' Model

Galbis (1977) developed a financial intermediation-growth model with two sectors: the traditional self-financed sector with low fixed return on capital (r_1); and the modern technology sector with a constant high rate of return on capital (r_2). This model indicates that financial repression policies, in particular low real interest rates, encourage economic dualism by allowing projects, with low rates of return on capital, to take place; compete; and crowd out high quality investment. Therefore, financial liberalisation policies spur the rate of economic growth by promoting the average efficiency and quality of investment (output/capital ratio).

This model assumes that there are two factors of production, capital and labour, which are utilised fully and that they receive payments equal to their marginal productivities. Hence, according to Euler's theorem, the total output is distributed fully amongst the production factors based on their marginal productivities as follows:

$$Y = Y_1 + Y_2 = r_1 K_1 + \omega_1 N_1 + r_2 K_2 + \omega_2 N_2 \quad (2.10)$$

Where: r_i and ω_i are the real rate of returns on capital and labour (K, N) in sectors one and two respectively. Based on the assumption that the production factors are constant and utilised fully, and capital resources are redistributed from the traditional sector to the modern technology sector, an increase in K_2 , at the expense of K_1 , would increase the average productivity of capital σ and, hence, the total output Y since $r_2 > r_1$.

In the traditional sector, the total investment is self-financed completely since they do not have access to borrowing from banks. Therefore, the level of investment is determined positively by the real rate of return on capital (r_1) and related negatively to the real interest rate of bank deposits ($d - \pi^e$) as follows:

$$I_1 = H_1(r_1, d - \pi^e)Y_1 \quad (2.11)$$

Since the traditional sector is constrained by self-finance and bank deposits are the only available form of financial assets, the saving function can be represented as:

$$S_1 = I_1 + \Delta \left(\frac{M_1}{P} \right) \quad (2.12)$$

Where: $\left(\frac{M_1}{P} \right)$ is the accumulated real money balances in the form of bank deposits held by the traditional sector. Consequently, in the modern technology sector, the supply of capital resources is determined by the level of savings in the modern technology along with the volume of bank credit. This depends on the level of bank deposits held by the traditional sector. Hence, the level of investment is given by:

$$I_2 = S_2 + \Delta \left(\frac{M_1}{P} \right) \quad (2.13)$$

Similarly, in the modern technology sector, the investment decisions are determined by the cost of borrowing; the banks' real rate of lending ($l - \pi^e$), in a negative relationship and the real rate of return on capital in the modern sector (r_2) in a positive relationship. This is shown as follows:

$$I_2 = H_2(r_2, l - \pi^e)Y_2 \quad (2.14)$$

Accordingly, financial repression policies, which set the real interest rate of bank deposits lower than the equilibrium level, reduce the traditional sector's accumulated real money balances in the form of bank deposits. In turn, this constrains the available loanable funds and, hence, reduces investment in the modern sector. A higher real interest rate, brought about by financial liberalisation, would stimulate higher bank deposits at the expense of investment in the traditional sector and, therefore, more loanable fund would be available to invest in the modern sector. In other words, channelling financial resources from the traditional sector to the modern technology sector, would decreases (I_1) and would increases (I_2) and, in turn, would enhance the average productivity of capital resources and the efficiency of investment.

2.7.3 Mathieson's Model

Contrary to Kapur (1976), Mathieson (1980) postulates that the volume of fixed capital is employed fully and that bank credit is used to finance a fixed portion (θ) of the total working and fixed capital. Hence, the real demand for loans (L_D) can be written as:

$$L_D = \theta K \quad (2.15)$$

On the other hand, the investment decisions and, hence, the rate of capital accumulations is determined by the level of income and the firm's physical saving behaviours. These depends on both the real rate of return on capital (r) and the real interest rate on bank loans ($l - \pi^e$). Consequently, the rate of investment and, hence, the demand for bank loans is given by:

$$\Delta K = s(r - l + \pi^e).Y \quad (2.16)$$

Subsequently, dividing both sides by (K) and then substituting (Y/K) with the output/capital ratio (σ) gives Mathieson's growth model as:

$$\Delta K/K = s(r - l + \pi^e). \sigma \quad (2.17)$$

In the steady-state equilibrium ($\Delta K/K = \Delta Y/Y = \gamma$), so therefore:

$$\gamma = s(r - l + \pi^e). \sigma \quad (2.18)$$

The rate of economic growth (γ) is correlated positively with real rate of return on investment; the expected rate of inflation; and the efficiency of investment (output/capital ratio). However, it is affected negatively by the rate for nominal loans.

On the other hand, the supply of bank loans (L_S) is determined via the demand for bank deposits by the private sector (D) and the required reserve ratio by the monetary authority ($1 - q$):

$$L_S = q.D \quad (2.29)$$

Consequently, the private sector's demand for deposits can be written as follows as a positive function in both real interest rate on deposits ($d - \pi^e$) and the level of income (Y):

$$D = f(d - \pi^e).Y \quad (2.20)$$

In a competitive financial intermediation sector with zero cost and interest rate spread, the interest rate on bank loans should equal the interest rate on deposits over the ratio of loans to money stock ($l = d/q$). Hence, in the steady state equilibrium, the equilibrium interest rate of deposits is determined as follows by the equality between the demand for and supply of loans:

$$\theta K = q \cdot D \quad (2.21)$$

Dividing both sides by (q) and substituting Kapur's demand for real money function by the demand for bank deposits (D), equation (2.7), the equilibrium condition can be written as follows:

$$Y \cdot e^{a(d-\pi^e)} = (\theta/q)K \quad (2.22)$$

According to the rational expectations approach, economic agents are capable of estimating the effects of existing government procedures on the future direction and movement of the rate of inflation; on average, this is correct but subject to random errors. Therefore, in the steady-state equilibrium, the expected inflation rate should equal the actual inflation rate ($\pi^e = \pi$). Solving equation (2.22) for (d) gives:

$$d = \pi + (1/a) \log(\theta/q\sigma) \quad (2.23)$$

The equilibrium deposit rate is associated positively with the portion of investment financed by bank credit and the required reserve. However, it is associated negatively with the output/capital ratio. Indeed, to preserve the equilibrium in a competitive financial market, both the nominal rate of interest for deposits and the expected rate of inflation should vary together ($d = \pi^e$). Therefore, in this case, the equilibrium real deposit rate would be unresponsive to the change in the rate of inflation. In other words, money is neutral.

However, under a financial repression regime with fixed deposit rate below the equilibrium level, a fall in real deposit rate, resulting from a higher rate of inflation, would reduce the demand for real money balances and, hence, the real supply of bank loans. Furthermore, if $q < 1$ the real rate for loans would rise since $l = d/q$. Hence, a higher rate for real loans, coupled with a drop in real supply of bank credit, would hinder the level of investment and economic growth.

In summary, according to Mathieson's model, money is not neutral under financial repression policies such as imposing interest rate ceilings on deposit and/or loans rates under their equilibrium levels and/or high reserve required ratio. Since a fixed interest rate on deposits secures sensitive real money balances and, hence, bank credit to a change in the rate of inflation. Contrary, under a financial liberalisation regime where the market forces determine interest rates, money is neutral in the long-run. Financial liberalisation measures would encourage the demand for real money; bank credit; and, hence, the level of investment.

2.7.4 Fry's Model

Fry (1979, 1980, 1982) constructed a three-equation model to investigate empirically the impact of financial liberalisation and the interdependencies between saving; investment; and economic growth. Fry argued that financial liberalisation policies would enhance savings; the level of investment; and the average efficiency of capital through a bank credit availability mechanism. This approach can be explained by the following three equations.

Firstly, the real national saving rate (S_n / Y), is determined by the economic growth rate (γ); the real interest rate of deposits ($d - \pi^e$); the foreign saving rate (S_f/Y); the self-finance motive represented by the expected real rate of return on capital (r); and the one-lagged rate for national saving (S_n/Y_{t-1}). Consequently, the national saving function can be represented as:

$$S_n/Y = f(\gamma, d - \pi^e, S_f/Y, r, S_n/Y_{t-1}) \quad (2.24)$$

Where the rate for national saving is correlated positively with the rate of economic growth; the real rate for deposits; the real rate of return on capital; and the national one lagged rate for saving. However, it is related negatively to the foreign saving which is considered to be a substitute for the national saving. Since the higher foreign saving inflow encourages households and other economic agents to increase their current and future consumptions at the expense of saving.

Secondly, the investment ratio is represented as a function of the expected real rate of return on capital (r) and the real rate of interest on bank loans ($l - \pi^e$):

$$I/Y = H(r, l - \pi^e) \quad (2.25)$$

Where, the nominal rate for loans (l) is included in the model to ensure equality between investment and the pre-determined level of savings (both national and foreign) through the availability of the bank credit mechanism. Hence:

$$\frac{I}{Y} = \frac{S_n}{Y} + \frac{S_f}{Y} \quad (2.26)$$

On the other hand, the efficiency of investment is expressed by the output/capital ratio which depends positively on the real interest rate for deposits ($d - \pi^e$) with one lagged period as follows:

$$\sigma = f(d - \pi^e)_{t-1} \quad (2.27)$$

Finally, the long-run economic growth rate (γ_t) is given by the investment ratio that has taken place during the previous year and the average efficiency of the investment. Therefore, this is shown as follows:

$$\gamma_t = \sigma \cdot (I/Y)_{t-1} \quad (2.28)$$

Substituting equations (2.25), (2.26) and (2.27) in equation (2.28) gives:

$$\gamma_t = \frac{f(\gamma, d - \pi^e, S_f/Y, r, S_n/Y_{t-1})_{t-1} + S_f/Y_{t-1}}{1/f(d - \pi^e)_{t-1}} \quad (2.29)$$

Hence, Fry's model reflects both McKinnon's complementary hypothesis and Shaw's debt-intermediation view. A higher real interest rate on deposits, brought about by financial liberalisation, would stimulate the demand for real money balances and, hence, the supply of bank credit. Greater availability of loanable funds enhances the capital accumulation process in both new fixed and working investment and, in turn, these promote the level and the average efficiency of total investment (Fry, 1978). Furthermore, it is worth noting that the real rate of bank deposit is included in the growth equation to reflect, through promoting both the quantity and the quality of investment, the positive effect of the real credit availability mechanism on the rate of economic growth.

2.8 The Critics of the Financial Liberalisation Thesis

During the last three decades, financial markets have adopted different types of financial liberalization policies and programmes. This was particularly so in emerging market economies where, with the encouragement of the World Bank and the IMF,

financial liberalization policies were implemented as part of widely based structural programmes.

However, a number of criticisms were directed at the financial liberalization thesis which depends on a pure competitive financial market. These key problematic issues of financial liberalisation thesis can be summarised in the following points.

2.8.1 Relationship between Interest Rates, Savings and Growth

The financial liberalisation view assumes a positive relationship between interest rates and savings. However, using different econometric models, various empirical literature, (Dornbusch, 1993, Fry, 1988, Giovannini, 1985, Melo and Tybout, 1986, Oshikoya, 1992, Warman and Thirlwall, 1994) indicated that there was no significant relationship between interest rates and savings in different countries in Asia, Africa, and Latin America (Stein, 2010).

More importantly, since there was little evidence which supported this postulated relationship, empirical literature contradicted McKinnon and Shaw's model in terms of the direction of the relationship between interest rates; savings; and economic growth. Sahoo et al. (2001) examined the relationship between savings and economic growth in the case of India through the period from 1950 to 1999. Furthermore, they investigated the direction of causality between real savings and real GDP. They found a unidirectional relationship ran from economic growth to savings and not the other way around. Deaton (1989) provided ample of evidences from various empirical studies that savings had low interest-elasticity and he stated that "there is no theoretical basis, whatsoever for this presumption...there is also an enormous body of research, mostly but not exclusively in developed economies, that has singularly failed to show any empirical relation between interest rates and the rate of saving" (Deaton, 1989, PP. 87-88).

On the other hand, the proponents of financial liberalization hypothesis argued that financial liberalization encouraged worldwide financial integration and, thereby, enhanced governments and large firms' abilities to obtain more funds through international credit markets. However, financial liberalization experiences show that there was an increase in demand for credit by households to finance their purchases of durable goods, and by firms to finance speculative investment through acquisition of

existing assets. The only type of savings, which did increase, was the external debt (foreign savings). Banks were keen to fulfil the increased demand for loans and, consequently, banks were involved in high-risk loans and, hence, increased both deposit and lending rates. However, these loans were not matched by a similar increase in savings (Arestis and Sawyer, 2008b). Thus, a large part of the empirical literature asserted that higher real interest rates failed to increase savings (Bandiera et al., 2000). Therefore, on the one hand, financial liberalization leads to an increase in the debt/asset ratio and promotes debt crises and, on the other hand, increases short-run speculative activities which, coupled with risky financial strategies, resulted in banking crises.

2.8.2 Financial Liberalization and Financial Crises

Financial liberalization programmes were coupled with financial fragility and large number of banking sector crises in both developed and developing countries, for instance Chile 1981(Carl-Johan et al., 1996), experienced a number of financial crisis during the 1980s and 1990s. In the period between 1980 and 1985, Demirgut-Kunt and Detragiache (1998) examined the relationship between financial liberalization and financial fragility for a large number of countries including both developed and developing countries. Their results pointed out that financial liberalization gave banks and other financial intermediaries more freedom which might increase the probability of moral hazard and encourage banks to become involved with high risk projects. In turn, this increases the probability of financial fragility and banking crisis. However, the effect of financial liberalization on financial fragility and the banking sector depends on institutional factors which include the role of law in terms of: effective prudential regulations; effective monitoring; and supervision of banks and other financial markets. This is in addition to a well-functioning mechanism to enforce contracts, agreements and regulations.

During the 1980s and 1990s, there were an increasing number of financial crises as a result of financial liberalization (Arestis and Demetriades, 1999, Demirgut-Kunt and Detragiache, 1998, Grabel, 1995). Through the period from 1981 to 1992, there were at least 15 crises in the financial system in different countries. These crises cost the countries between 5% to 40% of their GDP to save their banking sectors (Laeven and Valencia, 2008, Stein, 2010). In an updated version, Laeven and Valencia (2012) reported 147 banking crises in financial sectors during the period from 1970 to 2011

which led to output losses ranging from 1.6% to 32.9% as a percentage of GDP in developed and developing countries respectively. Whilst, the average fiscal cost accounted for 3.8% to 10% of their GDP to restructure and rescue the banking sectors in advanced and developing countries respectively.⁴

2.8.3 Financial Liberalization and Poverty Nexus

Financial liberalization has distributional effects on the economy. Milanovi (2005) indicated that, during the periods of extensive financial liberalization policies, there were significant increases in domestic and global inequality. In this respect, high interest rates, brought about by financial liberalization policies, merely deter and harm small firms and leave large firms safe and sound. By eliminating directed credit programmes, financial liberalisation harms small and medium corporations through limited access to credit and finance. Besides, interest rate liberalization increases the borrowing costs to those firms. Consequently, a higher borrowing cost and reduced direct credit are more likely to harm poor groups and increase income inequality (Ang, 2010).

Moreover, on the one hand, financial liberalization may worsen the living standards of poor groups of people, through implementing financial reform programmes without taking into account sectors of population that might be harmed and which reduce the living standard of these sectors (Arestis and Caner, 2005). On the other hand, financial liberalization may worsen the living standards of poor groups of people through shifting political and economic power from non-financial to financial institutions (Grabel, 2003). Arestis and Caner (2004) pointed out that there were three main channels through which financial liberalization could affect poverty and income inequality. Firstly, there is the growth channel: financial liberalisation enhances the economic growth rate through mobilising savings; promotes capital accumulation; and allocates capital to the most productive investments (McKinnon-Shaw approach). Consequently, higher economic growth increases income and, thereby, reduces absolute poverty and income inequality. Secondly, there is the crises channel: macroeconomic changes, brought by financial

⁴ Output losses are computed as the cumulative losses in GDP estimated as actual GDP deviations from its long-run trend. The fiscal costs of the crisis are computed as the direct fiscal expenses as a result of rescuing and restructuring the financial sector. For further details on Systemic Banking Crises, see Laeven and Valencia (2008, 2010, 2012).

liberalisation, can lead to financial crises due to high volatility and vulnerability inside the economy. Thirdly, there is the access to credit and financial services channel: financial liberalization allows economic agents to have better access to credit and other financial services provided by the financial sector. Therefore, *Arestis and Caner (2004)* argued that the ultimate impact of financial liberalisation on poverty and income inequality was ambiguous.

Some other economists argued that financial liberalization increased income inequality since it benefited the most well-connected elites who were capable of capturing the gains from the new opportunities (*Claessens and Perotti, 2007, Rajan and Zingales, 2003b*). *Das and Mohapatra (2003)* indicated that, particularly in developing countries where there were weak instructional frameworks and legal enforcement, financial markets had benefited mainly the high income-class at the expenses of other parties.

2.8.4 Financial Liberalization Policies

During the period from 1955 to 1996, *Arestis et al. (2003a)* used data for fourteen countries, including both developed and developing countries, to assess the effects of different types of financial liberalization policies on the average productivity of capital. Their findings suggested that the effects of financial liberalization policies varied between countries; this reflected the countries' different institutional factors. Moreover, *Arestis et al. (2003a)* and *Stiglitz (1994a)* suggested that, in developing countries where the quality of institutional factors were weak, some forms of financial regulations, including restrictions on interest rates and directed-credit programmes to particular sectors, might enhance financial system stability and might have a positive impact on the average productivity of capital and economic efficiency. Similarly, *Demirgut-Kunt and Detragiache (1998)* and *Arestis and Sawyer (2008b)* highlighted the importance of the quality of institutional factor and these correlated inversely with financial fragility which was followed, usually, by periods of financial liberalization.

To sum up, the effects of financial liberalization programmes on macroeconomic performance varies between developed and developing countries according to the level of financial development; the stage of economic development; and the quality of the institutions.

2.8.5 Saving-Investment Relationship

According to neo-classical theories, there are no capital market frictions. Consequently, financial intermediation does not receive much attention in the neo-classical models (see for instance, Fama, 1980, Modigliani and Merton, 1958). These models postulate that savings create investment (McKinnon, 1973, Shaw, 1973). In other words, a higher rate for deposits encourages financial deepening which affects the economic growth rate positively (supply-led view) through capital accumulation, since savings-investment is the engine of growth (Papaioannou, 2007). In contrast, Post-Keynesian economists asserted that investment and capital accumulation were driven by a firm's investment decisions and hence credit creation process rather than the households' savings behaviour. Banks provide loans which thereby create money and which enables corporations to proceed with their investment plans. In turn, this increases the level of capital accumulation; output; and, hence, savings. Therefore, according to the Post-Keynesian view, investment creates saving.

Proponents of the financial liberalization hypothesis (such as; McKinnon, 1973, Shaw, 1973, among others) argued that savings preceded investment, in the sense that savings increased real money balances and, hence, capital accumulation which flowed into investment. In that sense, the neo-classical literature ignored the basic distinction between banks and other financial intermediaries. This led to the exclusion of banks from the New Consensus Macroeconomics, with disastrous consequences such as financial crises and fragility due to shallow understanding of the functions and effects of the banking sector in the economy (Arestis, 2009, Arestis and Sawyer, 2008a).

In credit-creating financial systems, banks create liquidity, whereas financial intermediaries circulate liquidity. Therefore, capital accumulation and investment projects are financed mainly through bank credit and not by savings. When investment takes place, the economic output increases and, hence, saving increases. In other words investment precedes savings.

2.8.6 Hedge and Curb Market Effects

Neo-structuralist economists (Buffie, 1984, Taylor, 1983, van Wijnbergen, 1982a, van Wijnbergen, 1983b) emphasised the importance of curb markets, where non-institutional and/or unorganised credit markets were working more efficiently than the

banking system. This is because commercial banks are subject to reserve required ratio which is considered to be a leakage from the liquidity cycle controlled by central banks.

According to the Neo-structuralist model, households own three types of assets: currency; bank deposits; and curb market loans; these are substitutes for each other. An increase in the bank deposit rate, caused by financial liberalization policies, might induce households to substitute curb market loans for bank deposits. This would lead to a higher curb market rate which, ultimately, reduces the total supply of loanable funds supplied by both the banking sector and curb markets. Moreover, an increase in the curb market rates increases the cost of working capital leading to a reduction in the level of investment and output. In turn, this raises the level of prices and induces households to substitute bank deposits for hedge assets.

2.8.7 Liberalized Financial Sector: Stability versus Volatility

Financial liberalization encourages the proliferation of speculative activities and short-termism at the cost of long-run economic growth. “Financial liberalisation induces two types of speculative pressures: expectations-induced and competition-coerced, both of which contribute to the increased presence of short-term, high risk speculative transactions in the economy and to the increased vulnerability to financial crises” (Arestis, 2005, p. 15). Particularly, high returns, brought about by financial liberalisation process, induce non-financial corporations to borrow and become involved in short-term speculative activities rather than productive investment. As a result of higher risk and uncertainty, this leads to a lower level of investment and a higher interest rate. Therefore, stock market financial assets are likely to be highly liquid and volatile leading to macroeconomic instability; financial fragility; and crises (Arestis et al., 2001).

The financial liberalization hypothesis postulated that free-market forces would encourage financial system stability and would protect the financial system from any collapse or crisis. However, Arestis and Demetriades (1996) and Dow (1996) indicated that competitive banking systems had to be regulated and supervised since they were accompanied by serious and major problems which led to financial fragility and crises. Since financial liberalization increases the demand for credit, the banking sector is willing to provide the increased demand for loans and, hence, becomes involved in high-risk projects and speculative activities.

In addition, Arestis and Glickman (2002), in line with Minsky's view (1986), showed that the instability of the financial systems deterred higher rates of growth and employment. Free market reforms, coupled with sequenced liberalization programmes, increase the feeling of invulnerability; weakening inhibitions against speculation processes; and reinforce euphoria leading to financial crises.

2.8.8 Financial Liberalization Programme's Speed, Sequencing and Financial Crises

With regard to the speed of the financial liberalization regime, McKinnon (1988a, 1993) argued that financial crises could be avoided by following the appropriate sequencing of the financial reform programme. Namely, the idea is to start by controlling inflation and, then, proceed to interest rate liberalisation; privatization programme; commercialization of the banking system; free foreign exchange rates; liberalization of international trade; and, finally, capital accounts liberalization (Stein, 2010). On the other hand, the World Bank (1989) argued that, during good times, governments ought to move very fast in financial liberalization programmes and very slowly and cautiously in bad times when borrowers' net worth was likely to be reduced by negative shocks such as, for instance, recessions (Arestis and Sawyer, 2008b).

Another group of financial liberalization proponents argued that financial liberalization failed as a result of bank deposit policies coupled with inadequate banking regulation and supervision and macroeconomic instability. These encouraged the banking sector to become involved in high-risk projects and to increase real interest rate conducive to firms' bankruptcies and banks' failures (for instance, McKinnon, 1988a, McKinnon, 1988b, McKinnon, 1993, WorldBank, 1989, Villanueva and Mirakhor, 1990)

This sheds light on the issue of financial liberalization preconditions and the problems which appear from different markets have different speeds of adjustment. Financial markets respond to shocks and changes in the economy faster than the real markets (labour and good markets). However, according to the proponents of the financial liberalization thesis, real sector liberalization seems to be a prerequisite condition for financial markets liberalization. Moreover, consistent financial repression policies are recommended during the first phases of economic liberalization programmes. Sachs (1988) indicated that different measures of liberalization programmes might work at cross-purposes and result in interrupting the growth of the real sector. For instance, an

increase in domestic real interest rates, leading to an appreciation in the exchange rate, results in discouraging exports; stimulates imports; and deters the real sector and the level of employment (Arestis and Sawyer, 2008b). Therefore, it is suggested that domestic financial markets' liberalization must take place before foreign trade and capital account liberalization. The 1997 South-East Asian crisis shows that shocks seem to be severe in emerging countries when capital accounts are liberalized. This suggests that a capital account should be opened in the last stage of a financial liberalization programme.

However, in 53 countries during the period from 1980 to 1995, Demirgut-Kunt and Detragiache (1998) tested empirically the relationship between some factors related to financial crises and financial liberalization. They found that there was a significant relationship between these factors and financial liberalization policies, even when, as recommended by McKinnon, they controlled the sequencing of financial liberalization.

On the other hand, Kaminsky and Schmukler (2003) state that sequences of financial liberalization policies does not matter. Liberalising capital account and/or stock market first does not have different effects than liberalizing domestic financial sector first. Similarly, Arestis et al. (2003b) argued that altering the sequence of financial liberalization had no effect with the result that, always, banking crises followed financial liberalization periods. Therefore, they suggested some forms of financial restraints might have a positive effect on economic growth and the efficiency of allocating resources.

2.9 New and Post-Keynesian Approaches

Some distinctive contemporary approaches to finance and economic development relationship are rooted in the ideas associated with Keynes. Section 2.2 mentioned Keynes's writings on money's role in economic development. Contemporary approaches are based on Keynes's ideas about coordination failures in the economy as a whole. One direction is pursued by Post-Keynesian economists who focused in the Keynes's emphasis on aggregate demand, true uncertainty regarding the future, and the state of expectations. This approach is reviewed in section 2.9.1. Other economists, adopting a New Keynesian approach, emphasize the importance of asymmetric information, imperfect competition, and market failure, analysed in section 2.9.2.

2.9.1 Post-Keynesian Approach

Given the classical assumption that saving creates identical investment, both the Neo-Classical and Endogenous Growth theories are supply-led growth. Changes in aggregate demand can affect resources utilization only in the short-run. However, the level of economic development and the growing of these resources are independent of demand factors. Consequently, perfectly competitive financial markets can influence economic growth by channelling savings and capital resources from savers to investors; this promotes the capital accumulation process and improves the productivity of investment.

In contrast to the Neo-classical theories, Post-Keynesian economists made some major contributions to the demand-led growth theory by stressing the importance of the demand forces in the capital accumulation process and economic development. Setterfield (2002) indicated that capital accumulation was affected by actual output and, hence, the demand via accelerator. In addition, based on Verdoorn Law, Kaldor (1957b) argued that the technical progress function was demand-determined. Hence, investment has positive effects on the aggregate demand; the available stock of capital; and the average productivity (Setterfield, 2002).

In particular, the Post-Keynesian theory of finance-growth nexus argues that the core problems affecting the financial markets are uncertainty, and speculation. These problems could lead to unstable financial process and later to financial crises. Uncertainty could be defined as a situation in which “current decision will generate outcomes later in time which cannot be known in advance, and which cannot be reliably predicted on the basis of a statistical distribution of past values for similar decisions” (Dymski, 2006, P. 397). Hence, Keynes’s ideas on uncertainty/investment relationships and financial markets play a significant role in investment and asset decisions. These decisions affects the level of and movements in aggregate demand, and hence the macroeconomic performance of the economy. Since different economic agents have different expectations, uncertainty gives greater opportunity to speculative activities in the financial markets. In that sense, economic agents buy financial assets and hope that their values will increase in the future leading to speculative gains.

On this basis, Post-Keynesian economists emphasize the negative impact of financial liberalisation on the level of aggregate demand and profits leading to lower investments and economic growth. Paul and Dutt (1991) developed a Kaleckian model in which a

higher interest rate for deposits, brought about by financial liberalisation, had two opposing effects in the short-term on aggregate demand and the level of output. A higher deposit rate stimulates savings and banking deposits; in turn, this increases the supply of loanable funds available for investment. Hence, lower effective loans rate spurs the level of investment and total output. On the other hand, a high deposit rate increases the marginal propensity of saving; this is considered to be a leakage from the circular flow of income and affects negatively the aggregate demand. Since the negative impact of financial liberalisation outweighs the positive impact, the level of aggregate demand and output declines and leads to a decline in profits. Entrepreneurs become pessimistic about the future due to uncertainty and lower profits leading to further reductions in aggregate demand; investment; and output levels.

Furthermore, Dutt (1991) rejected the loanable funds theory and indicated that, using a Post Keynesian model based on the principle of effective demand and excess capacity, the negative effects of financial liberalisation policies, in developing countries, were more severe in the long-run. Banks would pass the higher deposit rate onto borrowers in the form of a higher rate for loans. For a given mark up by firms, a higher borrowing cost would result in higher prices and a higher rate of inflation which would reduce real wages, aggregate demand, economic growth and worsen the distribution of income.

In the same vein, Minsky (1992), based on the credit view of money and finance by Schumpeter (1911) and Kalecki's ideas of investment and profits which determined by the structure of aggregate demand and the level of uncertainty (Kalecki, 1965), introduces the financial instability hypothesis. According to this hypothesis financial market fragility and speculative investment bubbles are driven by the business cycle and are generated endogenously in the economy.

Minsky pointed out that over time the market economy tend to move from a stable financial structure driven by hedge finance agents to unstable financial structure dominated by speculative and Ponzi units. The key factor that drives the economy towards the financial fragility and crisis is the accumulation of debt. In prosperous times, cash flow exceeds corporations' needs to pay back their debts generating speculative euphoria. Over time, asset prices volatility along with high debt levels relative to income would trigger the financial crisis. In the meantime, financial intermediaries constrained credit availability leading to a collapse in investment and asset prices,

causing an economic downturn. Thus, contrary to the proponents of financial deregulation, Minsky supported some forms of government intervention in order to regulate the financial markets and reduce the vulnerability of profits and aggregate demand.

Finally, another key aspect of the Post-Keynesian approach is represented by Grabel (2006) .She indicated that a financial liberalisation programme is inappropriate and detrimental for developing economies. Neoliberal financial programmes implemented in developing countries, such as Argentina, Mexico, Asia, Brazil and Turkey, were always followed by financial crises. These financial liberalisation programmes promote market control of the internal and external financial flows rather than government intervention and regulations. Thereby, the domestic economies prone to various types of currency and financial risk that increase the likelihood occurrence of the financial crises. There are five distinct but interrelated risks that associated with financial reform programmes in developing countries, namely, currency, flight, fragility, contagion, and sovereignty risk.

2.9.2 New Keynesian Approach

New Keynesian economists put more emphasis on information asymmetry and market failure problems that arise as a result of financial market imperfections. Imperfect financial market theories assert that financial markets suffer from moral hazard and adverse selection problems due to asymmetries of information and risk. Therefore, financial markets may not be able to allocate capital resources efficiently to the most promising investments.⁵

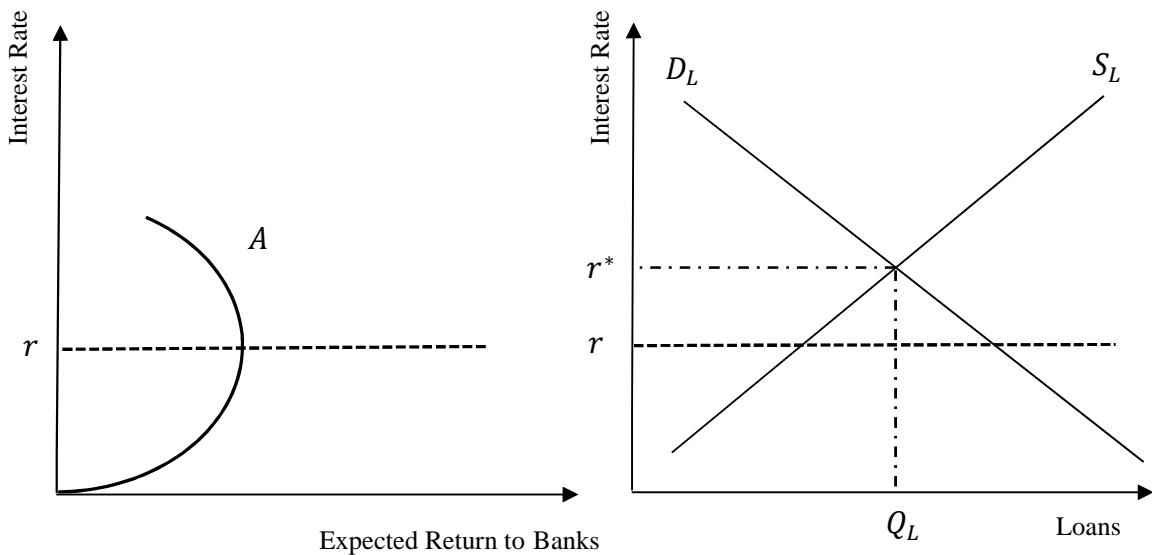
2.9.2.1 Imperfect Financial Markets

Stiglitz and Weiss (1981) illustrated that banks were able to categorise the probability distribution function of risk/returns for each group of projects, where different projects with different level of risks had different probability distributions of returns. Consequently, the banking sector charges an interest rate which corresponds to the average return on projects. This interest rate dampens both the quantity and quality of loanable fund portfolio through:

⁵ For further details regarding the critique of new Keynesian from a Post-Keynesian prospective see Rotheim (1998).

- (i) The adverse selection effect: bank returns depend on the possibility of borrowers to repay their debts. Therefore, using an interest rate, as a screening device to verify creditworthy borrowers with high probability of repayment, worsens the credit provision process. Investors, with high risk/return projects, are prepared to pay a high interest rate since their probability of failure is high. On the other hand, a high interest rate excludes investors, with high-trust projects and low risk/returns, to have access to bank credit.
- (ii) The moral hazard effect: interest rate and other conditions of loan contract alter the borrower's behaviours. A high interest rate encourages borrowers to undertake high risky projects and there is a low possibility of success to be able to pay back the high borrowing cost.

Figure 2.2. Credit Rationing in Imperfect Financial Markets



Source: the Author and Stiglitz and Weiss (1981)

In order to maximise their profits, banks would set the loans rate at (r) below the equilibrium interest rate; this resulted in excessive demand for loanable funds (see Figure 2.2). From the bank's point of view, (r) is the optimal loans rate at which their expected returns are maximised as a result of the former two reasons. At point (A), banks become risk averse and, using credit rationing, do not allow the interest rate to

increase beyond the optimal rate. Borrowers, who are willing to pay an interest rate higher than the optimal rate, are more willing to be involved in high risk projects. This is compared to borrowers who are involved with projects for which they receive average loans at the optimal rate (Guttentag and Herring, 1984, Jaffee and Russell, 1976).

Under these circumstances, some projects, with high social returns, are not undertaken since the level of available credit is less than the optimum social level determined by the equilibrium between the demand for and supply of credit (Q_L). Consequently, this reduces investment and economic growth.

In summary, financial markets are imperfect and unclear; this is considered to be as a case of market failure which requires some forms of government intervention through financial regulation policies. Vittas and Cho (1994) indicated that directed credit programmes to the priority sectors had contributed positively to the level of investment and, hence, economic growth in Japan and South Korea during the period from 1950 to 1990. Moreover, Cho (1986) argued that in developing countries, given the absence of well-functioning stock markets and the imperfections of the financial markets due to adverse selection and moral hazard effects, financial liberalization measures, such as elimination of interest rate ceilings and directed credit programmes, would not enhance the efficiency of capital allocation. Therefore, the government should intervene and impose some restrictions on the banking sector to improve the efficiency of capital accumulation. This can be done by securing funds to projects with high social returns until a well-developed stock market is established as an alternative channel for these projects to raise funds.

2.9.2.2 Financial Market Failures Controversy

In a similar vein, Stiglitz (1989, 1994a) mentioned some aspects of the imperfections in financial markets which might provide good reason for government intervention in the financial markets in order to achieve the efficiency of capital allocation. These were:

- (i) Monitoring is a public good: investors like to have two types of information in order to monitor the financial institutions. This is information about the solvency of financial institutions; and information about the management of these institutions. However, all forms of information are public goods and, therefore,

it might be undersupplied. This could encourage managers to take inappropriate risk and decisions or to direct funds for their own benefits.

- (ii) Externalities of deposits, lending and monitoring processes: bad banks make it difficult for good banks to attract savings and deposits. On the other hand, poor firms, which seek to raise their capital through the equity market, affect good firms adversely.
- (iii) Externalities of financial disruption: the failure of any financial institution may affect other financial institutions adversely. On the one hand, the bankruptcy of any bank may hinder the flow of credit to borrowers. On the other hand, some savers might withdraw their funds from other financial institutions as a result of these institutions' risk of bankruptcy. Hence, there is a divergence between the social cost and the private cost of the financial institution's failure.
- (iv) Financial markets suffer from imperfect competition due to asymmetric information problems. In credit markets, there can be a limited number of financial institutions (banks) and, hence, borrowers can find it difficult to switch from one institution to another. A borrower, who has a long relationship with one bank and is considered to be a good customer, might be unknown to another bank and, therefore, is unable to obtain loans.
- (v) According to Pareto efficiency, the two main conditions are a complete set of markets and information is exogenous (not affected by participants' actions in the market). However, since social returns differ from private returns, these assumptions do not exist in the financial markets. Projects with the highest expected returns from the private perspective may not be those with the highest expected returns from social prospective (for instance manufacturing projects). However, those private projects are the ones which receive funding. Therefore, financial markets may fail in allocating capital resources to their best uses.

New Keynesian economists argued that, under the condition of imperfect information in the financial markets, it was rare for markets to be able to achieve Pareto efficiency. Consequently, government intervention, through specific financial repression policies, might be able to tackle that market failure and might be able to enhance the economic growth (Demetriades and Luintel, 1996, Stiglitz, 1994a). Therefore, government

intervention, through mild-financial repression policies, might be a good way to deal with the failure of financial markets and make all individuals better off.⁶ Financial repression policies, with high quality government institutions, may be able to achieve high levels of economic growth. For instance, “the experience of high performing Asian economies (HPAE) indeed provide some evidence to support the hypothesis of mild repression. Although these countries have introduced financial reforms at various times ... these reforms were counteracted by protected periods of financial repressions” (Chowdhury and Hossain, 2003, p. 47). Moreover, South Korea (1960s – 1980s), Brazil (1960s – 1970s), Japan and contemporary China are good examples of successful catch-up economic development that included financial repression policies, where selective financial regulations along with high quality government institutions, contribute positively to an export-led strategy and enhanced the rate of economic growth (e.g. WorldBank, 1993, Patrick and Park, 1994, Arestis and Demetriades, 1996).

However, government intervention might fail, also, and, hence, financial repression may harm the economic growth. Therefore, the relationship between financial development and economic growth depends on the interaction between the quality of institutions; the structure of the financial system; and the financial policies (Arestis et al., 2005, Stein, 2010, Minea and Villieu, 2010).

2.9.3 Keynesian Approach and External Liberalisation

Another key dimension of financial liberalisation thesis concerns the role of external deregulation. On the basis that capital account liberalisation and floating exchange rates would reduce the cost of capital, enabling high degree of risk diversification, it accelerates financial development. This in turn would facilitate capital accumulation and promote long-run economic growth. However, according to the Post-Keynesian prospective, floating exchange rates associated with capital account liberalisation would provide greater incentive for speculative activities and high risky investment leading to currency and/or banking crises (Palma, 2002, Singh, 2003, Stiglitz et al., 2006). In

⁶ Mild financial repression in the sense that financial assets have a positive real rate of return (real interest rate) although the nominal interest rate is below its equilibrium level. Hence, the negative impact of financial repression on financial sector is insignificant and trivial. Therefore, moderate financial repression has a positive impact on the development of the financial sector and the efficiency of capital accumulation leading to higher economic growth.

addition, financial liberalisation regime would deter the real sector and the economic growth rate through encouraging short-terminism and high risk speculative activities which in turn deter the long-run investment and capital accumulation process (Grabel, 1995, Weller, 2001).

Furthermore, Felix indicated that speculation brought about by financial liberalisation has two drawbacks. “One consequence has been a dramatic weakening of the power of central banks to counter speculate collectively against unwanted exchange rate movements. A second has been a reversal of the initial decline in the ratio of official reserves to exports” (Felix, 1997, P. 200). Therefore, the Post-Keynesian approach tends to argue in favour of “Tobin Tax”. Tobin (1978) illustrated that speculative activities brought about by financial market integration considered as a key source of destabilisation. Hence, in order to achieve financial market stability Tobin suggested imposing some form of restrictions on international currency transactions, such as a 0.5 % tax, which is commonly known as the “Tobin Tax”. This tax aimed at stabilizing the financial markets through minimising short-term capital flight that takes advantage of interest rates and/or exchange rates differentials between countries.

On the other hand, Davidson (1998) expressed his concern regarding the effectiveness of Tobin Tax and provided an alternative way to curb the financial market volatility through establishing a creditable market maker which act as international clearing union. However, the market maker is not restricted to foreign exchange market, as in Tobin Tax, but applies to the overall financial markets.

This chapter focused mainly on internal financial liberalisation. The role of international capital flow and international financial deregulation on financial structure, development of the financial system in developing countries will not be addressed in detail within the remit of this thesis.

2.10 The Neo-structuralist School

Neo-structuralist economists (such as, Buffie, 1984, Taylor, 1983, van Wijnbergen, 1982b, van Wijnbergen, 1983b, among others) claimed that, in developing countries, the financial sector was characterised by financial dualism where there were two different types of financial institutions inside the economy. These are the organised financial market, namely the banking sector; and the unorganised financial market,

namely curb-markets, where the public can lend directly to firms. Neo-structuralist models assert that financial liberalization affects investment and growth negatively. An increase in the official money market rate for deposits reduces the total supply of credit and spurs the curb market rate. On the one hand, if the total supply of loanable funds available to firms is reduced, the level of investment declines and, consequently, harms the rate of economic growth. On the other hand, a higher curb market rate increases the price level determined by a mark-up over the cost of production; these are based on the following assumptions (Fry, 1995):

- (i) Wages are identified as based on class conflict according to the Kaleckian approach.
- (ii) Mark-up pricing framework in which price is determined by a mark-up over the total cost of production.
- (iii) Cost-pull inflation approach in which relative powers of workers and entrepreneurs determine the rate of inflation.
- (iv) Savings are made out of profits rather than out of wages.
- (v) Households and investors have full access to both types of financial markets where funds can flow freely between them.
- (vi) Curb-markets are working more efficiently than the banking system. This is because commercial banks are subject to reserve requirements which are controlled by central banks and are considered to be a leakage from the liquidity cycle leading to decline in financial intermediation.

Neo-structuralist models criticize the McKinnon-Shaw thesis for not including the unorganised money markets in their model given the importance and the widespread use of curb markets in developing countries. This is because, in developing countries, a significant portion of borrowers do not have access to credit provided by the official (organised) financial markets due to the heavy collateral and other requirements (Ghatak, 1995). Therefore, they rely heavily on the curb market where the lending process is less complicated and they can borrow loans easily. In the curb markets, lenders have the advantage of being local and lending on a one-to-one basis. Hence, they can screen easily and acquire all information about both existing and potential borrowers. Furthermore, they are not subject to the reserve required ratio which makes them more efficient when compared to the official money market.

2.10.1 Van Wijnbergen's Model

Van Wijnbergen (1982b, 1983a, 1983b) declares the importance of unorganised money markets in developing countries and investigates the effect of financial liberalization on capital accumulation and economic growth by using a macroeconomic model with a Keynesian adjustment mechanism. According to a Tobin-type portfolio framework, households assign their real wealth between three categories of financial assets, namely currency (C); time deposits (TD); and direct loans to the business sector through the unorganised money market (L_u^s) as follows:

$$C = f^c(\pi, i, r_{td}, y)W \quad (2.30)$$

$$TD = f^{td}(\pi, i, r_{td}, y)W \quad (2.31)$$

$$L_u^s = f_u^s(\pi, i, r_{td}, y)W \quad (2.32)$$

Where (π) is the inflation rate; (i) is the equilibrium nominal interest rate in the unorganised market; (r_{td}) is the interest rate on time deposits; (y) is the real income; and (W) is the real wealth.

The banking sector's real supply of credit (L_b^s) is determined by the demand for excess reserves; the required reserve ratio ($1 - q$); the volume of time deposits; and the lending rate (r_L) which is set by the government under its equilibrium level. Hence:

$$L_b^s = b(\pi, r_L)q \cdot TD \quad (2.33)$$

On the other hand, the business sector depends primarily on credit to finance all working capital. Therefore, the real demand for loans (D) depends positively on the real wages (w) and output (y) as follows:

$$D = d(w, y) \quad (2.34)$$

The business sector absorbs the entire banking sector's real supply of credit which is offered at a lower borrowing cost (loans rate less than the equilibrium) and meets the rest of the real demand for loans through unorganised money market. Hence, the equilibrium in the money market suggests that:

$$D = L_b^s + L_u^s \quad (2.35)$$

$$L_u^s = D - L_b^s \quad (2.36)$$

Substituting equations (2.31), (2.32), (2.33) and (2.34) in equation (2.36) gives:

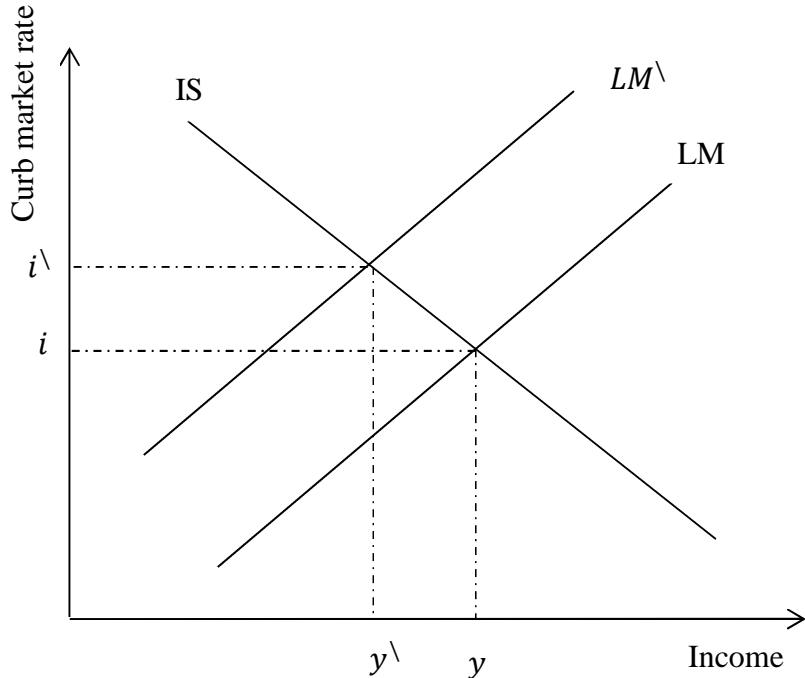
$$f_u^s(\pi, i, r_{td}, y)W = d(w, y) - b(\pi, r_L)q \cdot f^{td}(\pi, i, r_{td}, y)W \quad (2.37)$$

Differentiating equation (2.37) gives the money market equilibrium which is represented by the LM curve in figure (2.3). Whilst the real sector is represented by a fixed price Keynesian output model in the form:

$$y = A(i - \pi, y) \quad \text{where } A_i < 0 \text{ and } 0 < A_y < 1 \quad (2.38)$$

Differentiating equation (2.38) gives the equilibrium in the real sector which is illustrated by the IS curve in figure (2.3).

Figure 2.3. Curb Market Equilibrium



Source: Van Wijnbergen (1983b)

In the official money markets, an increase in the interest rate of time deposits brought about by financial liberalization increases the demand for money. This shifts LM curve upward and, on the other hand, changes the structure of household's portfolio as individuals move away from currency and curb market loans into time deposits. This leads to an increase in the supply of money and, hence, the LM curve shifts downwards.

The net impact on the LM curve and money market equilibrium depends on the reserve required ratio and the elasticity of currency and curb market loans to a change in interest rate of time deposits. However, Neo-structuralists pointed out that, compared to currency, time deposits and the curb market loans were a very close substitute to each other and, therefore, substituting curb market loans for time deposits would decrease the total supply of credit to the business sector. This is because the official money markets (banks) are subject to the reserve required ratio which is considered to be leakage from the financial intermediation process. Ultimately, the LM curve would shift upward leading to an increase in the curb market loans rate and a reduction in the total output.

2.10.2 Taylor's Model

In a similar vein, Taylor's model (1983) investigates the effects of financial liberalization in the form of a higher time deposit rate under cost-push effects and the Tobin portfolio framework in which households allocate their wealth between gold, time deposits at banks and curb market loans. He claimed that the curb market intermediated more efficiently between savers and investors than the official money markets. Since the official money markets are subject to the reserve required ratio which is considered to be a leakage from the intermediation circle. Therefore, a rise in time deposit rate stimulates households to substitute curb market loans and gold for time deposits. However, the substitution from curb market loans is greater than from gold into bank deposits. In turn, this reduces the flow of credit to the business sector and discourages the total investment.

In the meantime, due to the effect of the working capital cost-push mechanism, a fall in the supply of loanable funds to the private sector increases the curb market rate leading to higher prices. This dampens the international competitiveness and profits and, hence, the level of investment. Therefore, in the short-run, the overall effect of a higher deposit rate is stagflationary, namely, a higher rate of inflation coupled with lower output and employment levels. However, in the mid-term, the reduction in household's net wealth and aggregate demand lowers the rate of inflation. Nonetheless, real wages rise as a result of a time lag in responses. Higher real wages deter the level of profits; investment; and, hence, economic growth.

2.10.3 Buffie's Model

Buffie's model (1984) scrutinises the impact of a higher deposit rate following financial liberalization in both the short and long-run using simple macroeconomic model in which an unorganised money market plays a substantial role as the main credit supplier. He pointed out that, if a higher interest rate stimulated a significant savings response, in this case the impact and the sign of the long-run multiplier could differ from the short-run multiplier.

In the short-run, a surge in deposit rate expands the banks' supply of credit at the expense of curb market loans as household's portfolio shifts out of currency and curb market loans to time deposits. Subsequently, the curb market rate increases as the total supply of loanable fund contract due to the banks' reserve required ratio leading to a reduction in investment and output. However, in the long-run, the curb market rate falls because of a strong saving response to the higher deposit rate which offsets the adverse substitution effect and reserve required leakage. Hence, the increased total supply of credit to the business sector leads to higher investment and growth.

Eventually, he declared that a powerful savings response to a higher rate for deposits, brought about by financial liberalization, would impact positively investment and economic growth in the long-run. However, there is a negative effect during the transitional period in which the level of investment, employment and output fall. Higher savings dampen the import expenditure offset by a fall in export revenues caused by cost-push inflation and lower international competitiveness. This generates the current account deficit and, hence, the exchange rate devaluation leads to a drop in the real financial wealth under the desired level and this increases the curb market rate. Indeed, this adjustment mechanism continues to the point where the saving effect is dominant in the long-run. This leads to the current account surplus; exchange rate appreciation; and financial asset accumulation. In turn, these weaken the curb market rate and boost positively investment and growth.

In summary, the Neo-structuralist economists have opposite results to McKinnon-Shaw School and, hence, different policy recommendations. However, , Fry (1989) argued that the impact of financial liberalization on macroeconomics performance might differ based on the pre-assumptions made regarding whether the official or unofficial money

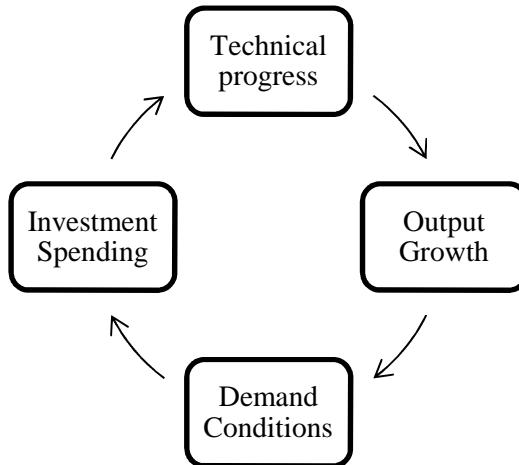
market is more efficient than the other. Whilst the McKinnon-Shaw school assumes that the official financial market is more efficient, the Neo-structuralist School supports the unorganised financial market. Indeed, whilst both approaches agree on the positive impact of financial liberalization on economic activities and growth, they disagree on which market should be liberalized.

2.11 Financial Development in Endogenous Growth Theory

According to the neoclassical theory, the level of output is determined by the amount of labour, capital stock and level of technological progress based on the assumption of diminishing marginal returns to capital as capital stock increases. Higher savings and, hence, capital accumulation enhances economic growth tentatively in the short-run. However, in the long-run, the sustainable economic growth rate requires successive technological progress.

In contrast, Endogenous Growth Theories consider the long-run economic growth rate as an endogenous outcome to the economic activities. This is affected endogenously by different mechanisms which stimulate positively the rate of augmenting labour and technical progress. On the one hand, neoclassical economists emphasise the importance of supply factors such as externalities of human capital and knowledge and R&D expenditure, whereby, even if there is no technical progress, the real output per capita grows endogenously. On the other hand, Post-Keynesian economists stress the importance of demand factors such as investment spending in physical capital. These lead to the changes in the growth of labour force and its productivity, whereby the growth of labour force adjusts towards the growth of the aggregate demand (see for example, Kaldor, 1957b, Palley, 1996, Palley, 2002, Scott, 1989 among others). They argued that investment spending affects the rate of technical innovations “so that investment serves simultaneously as the means of expanding the capital stock, feeding technical innovations into the production process and uncovering further possibilities for innovation” (Palley, 2002, p. 28).

Figure 2.4. The Link between Demand Conditions and Output in a Keynesian Model



Source: (Palley, 2002, p. 31)

Therefore, instead of diminishing returns to capital, the endogenous growth theories adopt the assumption of increasing returns to capital. This is because there are many reasons which prevent the marginal product of capital to diminish and raise capital-output ratio. On the one hand, Lucas (1988a), Romer (1990) and Aghion and Howitt (1992) broadened the concept of capital by including human capital and Research & Development (R&D) expenditure. This indicates that there are positive externalities for these components and, hence, the diminishing return on capital is irrelevant to the broadening concept of capital. On the other hand, Grossman Gene and Helpman (1991) pointed out the significance of technological spill-overs from trade and foreign direct investment. Whilst others highlighted the importance of infrastructure investment, technical progress, in the form of new ideas and learning by doing (Arrow, 1962, Kaldor, 1957a, Romer, 1986), is the only way for the economy to escape from diminishing returns to capital in the long-run. In this regard, finance is a matter for long-run economic growth.⁷

⁷ New growth theories try to explain differences in capital productivity between countries through differences in human capital (e.g. education); Research & Development (R&D) expenditure; technical progress and so on. In the Endogenous growth theories, many ideas are not new since these ideas go back to Kaldor (1957, 1961, and 1972). Many years ago, Kaldor's growth model, using the Technical Progress Function (TPF) indicated that, since the capital-output ratio remained constant although an increase in capital-labour ratio, there was a bi-direction relationship between capital accumulation and technical progress. This must be due to an upward shift in the TPF as a result of technical progression, and suggests increasing returns to capital or some forms of externalities.

Thereby, it is possible to sustain the long-run economic growth and the accumulation of production factor through changing the propensity to save (capital accumulation); financial policies; financial structure; and institutional arrangements. These affect positively the savings rate; the level of investment; the efficiency of capital resources; and, hence, the economic growth rate in the long-run.

In early 1990s, building on the work of Romer (1986) and Lucas (1988b), some economists incorporated financial markets into the Endogenous growth model and indicated that, through technological progress, financial development could affect both the level of output and the rate of economic growth in the long-run in a mutual relationship (such as, Bencivenga and Smith, 1991, Levine, 1992a, Bencivenga et al., 1995, Blackburn and Hung, 1998, Greenwood and Jovanovic, 1990, Greenwood and Smith, 1997, King and Levine, 1993b, Pagano, 1993, Saint-Paul, 1992, among others). These models pointed out that financial development reduced information asymmetry and other capital market imperfections which promoted capital allocation efficiency and, hence, improved both the quality and the quantity of capital resources leading to higher economic growth. On the other hand, higher economic growth encourages the demand for more financial services and intermediaries and, consequently, greater competition and efficiency in the financial markets.

Bencivenga and Smith (1991), Levine (1992b) and Greenwood and Smith (1997) advanced an endogenous growth model investigating the interaction between financial intermediation and economic growth in overlapping-generations based on Diamond and Dybvig (1983a) model of bank liquidity. Their main findings indicated that financial institutions and services accelerated economic growth. This was done by augmenting the efficiency of capital allocation to its highest social returns; changing the composition of domestic saving by inducing individuals to accumulate physical and human capital along with other types of financial assets; and, finally, encourages more specialisation and technological innovation. Thereby, it promotes the average capital productivity.

Greenwood and Jovanovic (1990) postulated a reciprocal relationship between financial sector and economic growth. "Growth and financial structure were inextricably linked. Growth provided the wherewithal to develop financial structure, while financial structure in turn allowed for higher growth since investment could be more efficiently

undertaken” (Greenwood and Jovanovic, 1990, pp 1099-1100). They highlighted the importance of financial services and well-functioning financial institutions in pooling funding, research, gathering information and the monitoring process. This enables the financial sector to choose the best investment strategies and, hence, to allocate capital to those projects with the highest rate of returns.

Levine (1992b) examined how liquidity and productivity risk; economies of scale in transaction costs; and information collecting cost could stimulate the emergence of financial services and institutions using the endogenous growth model. This resulted in the emergence of different types of financial services and institutions in response to the economic development represented by the per capita growth rate. This model illustrates that financial structure and services does impact on investment decisions and, hence, the steady-state economic growth through various channels. Firstly, in addition to reducing the liquidity and productivity risk, this increases the portion of capital resources allocated to investment projects through mobilising more capital resources to productive investment. This leads to higher human capital; technological innovation, and a higher rate of economic growth. Secondly, financial institutions could minimize the firms’ premature capital liquidation through liquidity risk management which allows investors, who need quick access to their wealth, to trade their financial assets very easily and quickly with other individuals without incurring capital loss. Therefore, the financial sector provides investors with high liquid assets and, in the meantime, does not liquidate prematurely the capital of the project and, hence, offers the opportunity to finance long-term investment. Additionally, due to economies of scale in the costs of financial transactions and information gathering, the financial sector promotes the efficiency of capital allocation.

Using a simple endogenous growth model of the form AK model, Pagano’s growth model (1993) stresses the importance of financial factors and conditions as key determinants for economic growth, where aggregate output (Y) is represented as follows as linear and an increasing function in total capital stock:

$$Y_t = AK_t \quad (2.39)$$

Where (A) is the marginal productivity of capital; and (K) is the total capital stock which comprises both physical and human capital and depreciates at rate (δ). Consequently, the gross investment function can be written as:

$$I_t = K_{t+1} - (1 - \delta)K_t \quad (2.40)$$

The capital market equilibrium requires the equality between gross investment and gross saving. However, a fraction, from the gross saving $(1 - \phi)$, is consumed during the intermediation process and is considered to be leakage from intermediation circle and, thereby, indicates the inefficiency in the capital market:

$$I_t = \phi S_t \quad (2.41)$$

From equation (2.39) the economic growth rate can be written as:

$$g_{t+1} = \frac{Y_{t+1} - Y_t}{Y_t} = \frac{K_{t+1} - K_t}{K_t} \quad (2.42)$$

Substituting equation (2.39), (2.40) and (2.41) in equation (2.42) would give the rate of steady-state growth as:

$$g = \frac{I_t + (1 - \delta)K_t - K_t}{K_t} = \frac{\phi S_t}{K_t} - \delta = A\phi s_t - \delta \quad (2.43)$$

Where the gross saving rate is denoted by $s_t = S_t/Y_t = S_t/AK_t$

According to the endogenous growth model represented in equation (2.43) there are three main channels through which financial development can affect positively the rate of economic growth. Firstly, financial institutions can improve the marginal productivity of capital, (A), through gathering information; screening and monitoring investment projects in addition to risk-sharing; and, thereby, financing highly productive risky projects. Secondly, funnelling more savings into investment, (ϕ), by increasing the overall efficiency of the financial sector. Finally, financial development can affect positively the rate of economic growth by inducing economic agents to increase the saving rate (s).

Furthermore, by using an endogenous growth model in which innovation is considered to be the engine of growth and economic agents are divided into households, financial institutions and business firms, King and Levine (1993b) developed an alternative approach to identifying channels through which financial development affected the economic growth in the long-run. Financial institutions identify capable entrepreneurs who are able to manage and establish the innovation projects through research, scrutiny and monitoring projects more efficiently and less costly than individuals. These projects are more likely to be financed through the financial sector rather than being self-

financed by the entrepreneurs because the financial institutions are able to diversify the high costs and the high risks of failure.

Therefore, financial systems can impact on the entrepreneurs' innovative activities and, hence, can improve, through four channels, the average productivity and economic growth. These are to assess potential entrepreneurs and to identify the good ones; to mobilise capital resources in order to materialise promising investment projects; to provide a high degree of diversification for risk associated with innovative projects; and, compared to the existing methods, to disclose the advantages and high returns from innovation projects. Therefore, a well-functioning financial market promotes innovative projects and, through higher average productivity and efficiency of capital allocation, spurs the rate of economic growth

Moreover, Palley (1996) presented a growth model in which aggregate demand was integrated into the Neo-Classical Growth Model. This model indicates that capital accumulation is driven by a firm's investment spending rather than the savings behaviour of households. In a steady-state, the output growth rate must be equal to the aggregate demand growth rate and, consequently, the output growth rate is constrained by the aggregate demand growth rate. However, this model does not examine the dynamic of the savings behaviour by households.

In the same vein, Dutt (2006) introduced a growth model in which aggregate demand and aggregate supply interacted together in order to determine the rate of growth in the long-run based on the notion that there was a short-run deviation from full employment due to price and wage rigidity. Moreover, technological changes are determined endogenously since the rate of technological change depends on labour market conditions. Therefore, the endogenization of technological changes allows aggregate demand to affect the long-run rate of economic growth. Subsequently, financial policies, financial structure, and institutional arrangements can affect economic growth in the long-run through affecting investment and aggregate demand conditions.

2.12 Concluding Remarks

This chapter discussed alternative schools of thought on financial development; financial repression; financial liberalisation; and economic growth. According to the Neo-classical theory, capital accumulation is driven by households' savings behaviour

rather than firms' investment spending. An increase in the saving-investment ratio is offset by an increase in the capital-output ratio due to the assumption of diminishing returns to capital. Hence, the long-run rate of growth is unaffected. In the neo-classical model, the fundamental point is that saving leads to investment which means that supply creates its own demand (Say's law). Therefore, it is assumed that financial markets operate effectively in order to ensure that all savings flow into capital formation and that the allocation of capital resources is undertaken efficiently.

In the same vein, Tobin (1965) developed the neoclassical model through incorporating money and portfolio considerations. He indicated that an increase in money supply would increase the rate of inflation and this would cause a portfolio to shift away from money holdings to real capital. In turn, this increases the capital-labour ratio and the level of output in the short-run. However, the rate of steady-state growth is fixed and determined exogenously.

Consequently, based on the ideas of Keynes's liquidity preferences and Tobin's model which favoured government intervention in the economy, many developing countries have implemented various measures of financial repression policies (such as an inflation tax; lower interest rate; directed credit programme; high reserve requirements; and state-owned financial institutions,...etc.) in order to promote the rate of saving; capital formation; and the rate of economic growth.

In line with the neoclassical theory, the McKinnon (1973) and Shaw (1973) school argued that the financial repression policies, which were followed during the 1960s and the 1970s, affected savings negatively and resulted in financial markets inefficiencies which had adverse effects on macroeconomic performance. On the other hand, they presented a theoretical framework highlighting the important role of financial liberalization as a key factor in promoting financial development; the quantity and the quality of capital accumulation and growth-enhancing policies which spurred economic development and accelerated the rate of economic growth rate in developing countries.

However, the financial liberalisation thesis was attacked by both Post-Keynesian and Neo-structuralist schools. On the one hand, Post-Keynesian economists showed that financial markets were uncompetitive and imperfect due to asymmetric information; the principal agent relationship; and uncertainty problems. This is particularly so in less-developed economies where property rights, quality of institutions, contract

enforcements and legal framework are weak and less efficient. Therefore, particularly during financial liberalization periods, prudential regulation is necessary to ensure the stability of financial markets. Moreover, Post-Keynesian economists argued that under the condition of imperfect information in the financial markets, it was rarely to achieve Pareto efficiency. Consequently, government intervention, through specific financial regulation policies, might be able to tackle the market failure and to enhance the rate of economic growth.

On the other hand, Neo-structuralist economists stress the importance and efficiency of unorganised financial markets and curb markets, since the official money markets, the banking sector, are subject to the reserve required ratio which is considered to be leakage from the financial intermediation process. Neo-structuralist models pointed out that financial liberalization had a negative effect on investment and growth. An increase in the official money market deposit rate brought about by financial liberalization reduces the total supply of credit and spurs on the curb market rate. In turn, higher curb market rate on the one hand, dampening the total supply of loanable funds available for the business sector, depresses the level of investment and harms the rate of economic growth and on the other hand, increases the level of prices and causes stagflation inside the economy.

3 Financial Development and Economic Growth: Literature Review

3.1 Introduction

This chapter is motivated by the current financial crisis, its causes and its consequences for the world economy, which cast doubts on the validity of the mainstream approach and its principle ideas. The proponents of the mainstream argue that saving creates investment; and that the economy tends to operate at full employment. Therefore, the financial market operates efficiently to ensure that all savings flow into capital formation rather than credit creators. In contrast, Post-Keynesian economists indicate that financial institutions, as credit creators, play a key role in financing investment spending; enhance capital accumulation; and feed technical innovations into the production process.

To this end, this chapter reviews the empirical literature on finance and growth nexus in the context of the mainstream approach. In particular, the purpose of the chapter is to analyse critically, the functional approach and key channels through which financial development can affect the rate of economic growth. Then, the subsequent section examines theoretically and empirically the possible directions of causality between financial development and economic growth. This is followed by a literature review on the relationship between financial development and economic growth.

The relationship between financial system development and economic growth has received considerable attention over the last four decades. The theoretical foundation of the relationship between finance and growth goes back to Adam Smith (1776). Moreover, Schumpeter (1911) highlighted the importance of the banking system and financial intermediaries in economic growth and the circumstances when financial markets could stimulate capital accumulation and future growth through funding innovations and productive investments. In contrast, Robinson (1952) suggested that, as the real economy grew, more financial services and institutions arose in order to satisfy the demand for financial services, namely, financial development follows economic growth.

In line with Schumpeter's view, numerous influential economists, such as Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969), argued that the financial system was

a very important aspect in fostering the economic growth. However, this view had little impact on formulating policies leading to the expansion of the financial system at this time because of the dominance of the “financial repression” view. According to this view, various restrictions, such as interest rate ceilings; directed credit programmes; and high reserve requirements, are imposed on the financial system.

Building on the early works of Gurley and Shaw (1955), Goldsmith (1969), and Hicks (1969), McKinnon and Shaw (1973) indicated that easing financial constraints and repression policies would enhance the rate of saving; capital accumulation; and the average efficiency of investment, since investors stopped undertaking low-yielding investment projects. These restrictions, imposed on the financial systems by government intervention, through directed credit to less productive sectors; interest rate ceilings; and restricted financial development, could reduce saving; could retard capital accumulation; and could prevent efficient resource allocation; these could deter the economic progress. Therefore, they called for financial liberalization policies which promoted the amount of saving and, hence, investment (Ang, 2008).

Since then, a flourishing body of empirical studies were devoted to investigating and examining the linkages between financial development and economic growth. A large number of the empirical literatures asserted that financial development and institutions were regarded as one of the most fundamental factors which contributed positively to the rate of savings; capital productivity; and resources allocation efficiency (Levine, 1997, Pagano, 1993). This important contribution comes from the key functions provided by the financial system. Therefore, there is wide acceptance that countries, with well-functioning financial systems, contribute positively to the economic growth in both developed and developing countries.

The literature proposed various channels according to which financial development can affect the rate of economic growth. In particular, endogenous growth theories focus on a range of services provided by the financial sector which are vital in modern economies and which help to promote the process of growth across countries. They stress the importance of liquidity; gathering information; and the risk diversification functions provided by financial markets. In turn, these factors improve capital accumulation and efficiency of investment. In other words, these functions would stimulate both physical capital accumulation and the average productivity of investment. Thereby, a well-

functioning financial sector would promote the average productivity of firms and the efficiency of resources allocation (Ang, 2008, Levine, 1997).

In contrast, Schumpeterian and Post-Keynesian economists (Dutt, 2006, Palley, 2002) emphasised usually the importance role of the banking system and financial institutions in creating money and channelling it into the most productive and appropriate uses. In addition, Post-Keynesian economists indicate that, as credit creators, financial institutions increase investment spending; enhance capital accumulation; and feed technical innovations into the production process and, thereby, enhance the productivity of capital and economic growth. Keynesian economists consider investment to be a double-edged sword; on the one side, it increases the aggregate demand through the multiplier and, on the other hand, it increases the aggregate supply through its effect on expanding productive capacity.

Based on the previous discussion, this chapter's main objective is to review the theoretical and empirical literature on the relationship between financial development and economic growth and the pattern of causality. Therefore, this chapter is organised as follows. Section 1.2 explores the functional approach and key channels through which financial development can affect the rate of economic growth. Section 1.3 examines theoretically and empirically the possible directions of causality between financial development and economic growth. Section 1.4 presents the literature review on the finance-growth nexus whilst, finally, Section 1.5 presents the concluding remarks.

3.2 The Functional Approach

There was an extensive debate regarding the impact and channels through which financial development could affect the rate of economic growth. Endogenous growth literatures focused on the relationship between the financial functions, provided by financial system, and economic growth (see Figure 3.1).

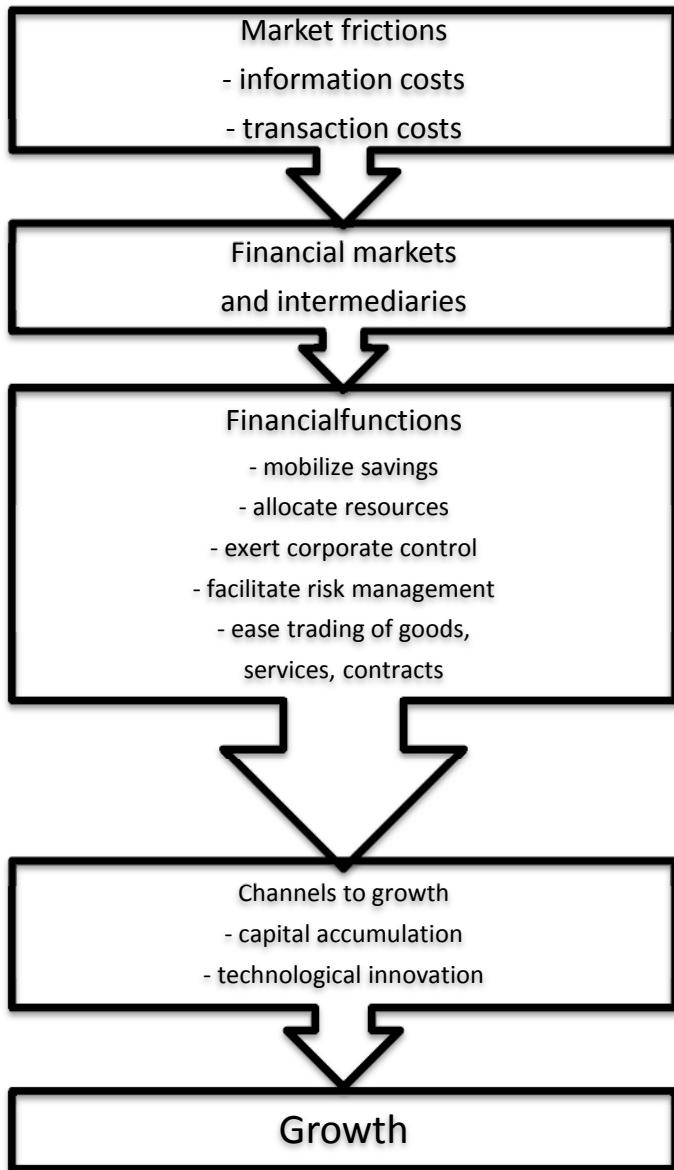
On the one side, Goldsmith (1969) showed that financial development might enhance the rate of economic growth and the economic performance through facilitating the transaction of funds from savers to investors. On the other side, Obstfeld (1994a) emphasised the importance of risk-sharing through greater financial market integration; this allowed individual to invest in high risk, high return, long-run domestic and international projects conducive to greater capital allocation efficiency. In addition,

Levine (1997) pointed out that financial development affected economic growth through two channels, capital accumulation and technical innovations. On the one hand, capital accumulation is affected by financial development through increasing the rate of savings and improving the allocation efficiency of savings amongst different investment projects. On the other hand, through services provided by the financial system, financial development enhances the rate of technical innovation.

According to Aziz et al. (2002) financial development can promote growth through three channels; firstly, increasing the marginal productivity of capital through sharing risk and collecting information about project. Secondly, it boosts the saving/investment ratio by reducing the cost of financial transactions and increasing the efficiency of the financial system. Thirdly, it increases the rate of private savings.

In that sense, most endogenous financial-growth models stress the significant impact of the financial sector in improving the efficiency and the quality of capital allocation and, hence, economic growth rather than the quantity (see for example, Bencivenga et al., 1995, Greenwood and Jovanovic, 1990, Greenwood and Smith, 1997). A well-functioning financial sector contributes positively to the economic growth through a variety of channels which are considered to be the financial sector's primary functions. These channels provide liquidity; pool and diversify risks; acquire information about firms and monitor managers; exert corporate control; and the mobilization of savings (Levine, 1997). However, a debate exists about the potential effects of these channels on economic growth.

Figure 3.1. A Theoretical Approach to Finance and Growth



Source: Levine (1997, P. 691)

3.2.1 Liquidity and Uncertainty

In financial markets, liquidity refers to the relative ease and speed with which agents can convert assets and securities into a medium of exchange without a large change in price between trades (Economides and Siow, 1988, Mishkin, 2003). In other words, it is an indicator of shareholders' ability to convert securities and other financial assets into purchasing power without a high transaction cost. The literature emphasised the link between financial markets as suppliers of liquidity and economic growth

(eg;Bencivenga and Smith, 1991, Bencivenga et al., 1995, Bencivenga et al., 1996, Bhade, 1993, Diamond and Rajan, 1996, Fulghieri and Rovelli, 1998, Levine, 1991).

Levine (1991) and Bencivenga et al. (1996) indicated that a liquid financial market might reduce risk and investment costs for long-run projects which required, at initial levels, large amounts of external capital injection for long periods of time before yielding profits. However, there is a conflict between savers and firms. On the one hand, profitable projects require usually a long-term financial commitment. One the other hand, savers are less willing to abandon their savings for a long period of time.

To this end, a liquid financial market can bring these two conflicting positions into line with each other, and resulting in liquid financial market savers having full access to their savings through the stock market where they can sell their equities easily and quickly whilst firms have full and permanent access to capital through issuing equities. Moreover, as financial market transaction cost decrease, more investment takes place in illiquid high-return projects. Therefore, a liquid financial market may facilitate investment in long-term projects and, hence, improve capital allocation; capital accumulation; and prosper economic growth. Furthermore, via the rate of technological innovation, financial markets liquidity can affect the economic growth. Fulghieri and Rovelli (1998) indicated that greater financial market liquidity encouraged individuals to shift their investments into high-return technological projects.

In contrast, some economists suggested that more liquid financial market might harm the economic growth. For example, Bencivenga and Smith (1991) and Jappelli and Pagano (1994) showed that greater financial market liquidity brought about by financial integration and financial liberalization policies might reduce saving rates through reducing uncertainty and result in harming the economic growth. Additionally, Bencivenga et al. (1995) showed that greater stock market liquidity might induce shareholders to reallocate their portfolios through purchasing securities on on-going projects and, far from establishing new investment projects, this would reduce the real rate of investment and harm the rate of economic growth.

In the same vein, Levine (1997) and Demirguc-Kunt and Levine (1996b) indicated that there were three channels through which greater stock market liquidity might hinder and affect adversely the economic growth. Firstly, in liquid stock markets, a rise in the real

interest rate may reduce the rates of saving through income and substitution effects.⁸ Secondly, reducing uncertainty, associated with investment projects through greater stock market liquidity, may deter the rates of saving. However, the effect of uncertainty on savings is ambiguous. On the one hand, less uncertainty spurs risk-averse shareholders to invest and, on the other hand, reduces the shareholder's demand for precautionary savings. Thirdly, greater stock market liquidity may affect corporate governance adversely since unsatisfied investors can sell their shares quickly and easily and leave the market. Greater stock market liquidity may spur investor myopia and ownership diffusion. In turn, this reduces investors' incentives to exert corporate control through monitoring and acquiring more information about firms and weakens investors' commitment since it reduces the exit costs for unsatisfied investors (Shleifer and Vishny, 1986, Bhade, 1993, Shleifer and Vishny, 1997).

3.2.2 Pooling and Diversifying Risks

Savers are less willing to invest in high-return projects since these tend to be more risky than low-return projects. Risk diversification is another channel through which a financial market may affect the rate of economic growth. Saint-Paul (1992), Devereux and Smith (1994), Obstfeld (1994b) and Bracker et al. (1999) indicated that financial markets provided vehicles for trading, pooling and diversifying risk through internationally integrated financial systems which reduced risk and induced savers to invest in high-return projects. Therefore, through shifting investment into technological and high-return projects, greater risk diversification may affect resource allocation positively and the economic growth.

Furthermore, Levine (1991) provided a model in which financial markets helped participants (shareholders- agents) to manage liquidity risk and productivity risk.⁹ In doing so, financial markets accelerate the rate of economic growth through two main

⁸ Theoretically, the ultimate impact of a higher real interest rate on savings is ambiguous since it depends on the relative magnitude of the substitution and income effects. On the one hand, a rise in the real interest rate would raise the price of current consumption relative to the future price and, hence, stimulate households to increase their saving (substitution effect). On the other hand, household's wealth would be inflated due to a higher interest rate leading to higher consumption which has a negative impact on saving (income effect).

⁹ Liquidity risk is the risk of being unable to trade financial assets easily and quickly except at a discount from their face value. However, productivity risk arises because, in the final period of production, firms are subject to productivity supply shocks.

channels. Firstly, they facilitate the trading process of a firm's ownership (securities) without disrupting the productivity processes. Secondly, by allowing the financial markets' participants to diversify their portfolios and, hence, to invest in a large number of firms. In turn, this increases the amount of capital resources available for firms; accelerates human capital accumulation; and spurs the economic growth. In contrast, Mauro (1995) developed an endogenous growth model in which stock markets, mutual funds and other financial institutions, which provided risk diversification, might hinder the rates of saving and, thereby, lower the rate of economic growth. In other words, the introduction of financial services and institutions, which allow agents to diversify their portfolios, may reduce the precautionary motive for saving and, hence, deter the economic growth.

However, Schumpeter (1911) argued that services provided by financial markets - mobilizing savings, monitoring managers and diversification of risks - were key factors for technological innovations. These allowed investors to reduce risks and diversify their portfolios of new technological products leading to greater investment in new technology and, thereby, greater economic growth. In line with Schumpeter's view, King and Levine (1993a) argued that well-functioning financial markets could promote technological innovations and, hence, could encourage economic growth through risk diversification than would otherwise be the case.

Bekaert (1995); Bekaert and Harvey (1995, 1998, 2000); and Bekaert et al.,(2002a, 2002b) pointed out that greater segmentation in the financial markets might increase the level of the risk which would affect adversely the local cost of the equities and, hence, the economic growth. Moreover, Stulz (1997, 1999) related some of the economic distortions, which occurred within the economy, to market segmentation. This arises when capital markets were segmented completely through restrictions on capital flows and investors do not have the ability to diversify their portfolios since they hold only equities from their local financial markets. Consequently, investors need high risk premiums to invest in industries which do not allow diversification and low risk premiums in order to invest in industries which provide diversification.

From another point of view, Saint-Paul (1992) pointed out that stock markets and financial intermediaries could spur economic growth through portfolio diversification. In other words, firms could increase productivity through greater specialization of

resources and division of labour. This means greater risk due to high probability of sector demand shocks. Financial markets allow specialization and division of labour through permitting shareholders to hedge by holding diversified portfolios. In the other case where financial markets do not exist, entrepreneurs have to spread their risks through diversifying their activities. However, this means less specialization and less productivity. Well-functioning financial markets allow shareholders to reduce risk through portfolio diversification whilst, at the same time, firms obtain benefits from specialized productive technology which, in turn, increases the efficiency of resources allocation and prospers the rate of economic growth.

As a result, industries, which provide diversification, are able to obtain capital needs at a lower cost than industries which do not. On this basis, the diversification effect encourages countries to specialise in inefficient industries which provide diversification and far from their comparative advantages. Hence, capital market segmentation may lead to an inefficient allocation of capital resources which, in turn, has a negative effect on the economic growth.

However, integrated financial markets mitigate market distortions and enhance the efficiency of capital allocation. This is because local investors have the ability to reallocate their savings from the inefficient industries to industries which have comparative advantages and diversify their portfolios since they have opportunities to invest in foreign stocks in international financial markets (Bekaert and Harvey, 1998).

Moreover, Hargis (2000) provided a theoretical model and empirical evidence that local financial markets integration with international markets was very beneficial for domestic financial market development. This is because integration of financial markets, through international cross-listing, increases domestic equities prices by enhancing risk diversification and liquidity in the domestic financial market. In particular, Hargis indicated that, through international cross-listing, integrated financial markets transformed a segmented local financial market from equilibrium with a low level of liquidity and market capitalization into an integrated financial market with high level of liquidity and market capitalization through increasing the revenue received by entrepreneurs and the number of participants in the market. Therefore, financial market integration may increase stock prices; the issuance of equities; enhance liquidity; and the development of these financial markets.

In contrast, Devereux and Smith (1994) and Obstfeld (1994b) demonstrated that internationally integrated financial markets might reduce risk and uncertainty through risk diversification. In turn, this might reduce precautionary saving and lead to a reduction in the rate of both saving and economic growth. Therefore, the theory is ambiguous about the ultimate effect of lower uncertainty and risk brought about by integrated financial markets on the rates of saving.

3.2.3 Acquisition of Information about Firms and Monitoring Managers

As specialised institutions, financial intermediaries are in a better position than individuals to monitor firms and corporations since they are able to benefit from economies of scale and reduce the cost of the monitoring process (Gale and Hellwig, 1985, Townsend, 1978, Williamson, 1986). Therefore, investors can obtain their capital needs at lower rates compared to direct borrowing from individuals and, hence, additional capital resources can be transferred into productive activities which improve the allocation efficiency of capital resources.

Financial markets play an important function as a monitor of firm's management both directly through evaluation of past contributions to the firm's value and indirectly as a market for corporate control. Consequently, the financial market may encourage investors to monitor and acquire information about firms. However, individuals may find acquired information relatively expensive when compared to their gains derived from the monitoring process. This is even more the case with respect to owners monitoring managers. Based on the efficient market hypothesis, Grossman and Stiglitz (1980), and Holmström and Tirole (1993) pointed out that stock prices incorporated information about a firm's performance which could not be obtained from the firm's profit data and that the quantity of these pieces of information depended on the liquidity of the financial market; the more liquid the financial markets, the more information in the stock prices and, hence, the greater the benefits from monitoring a firm's management. On the other hand, lower levels of financial market liquidity, through concentrated ownership, reduces the benefits from monitoring firms at the financial markets. In addition, they argued that the structure of firm's ownership would affect the value of the monitoring process in the market. Less concentrated ownership increases the traded shares in the financial market and, hence, the liquidity of the market increases. With greater market liquidity, individuals make profits from their private information;

this leads to an increase in the marginal value of information which encourages individuals to allocate more time and resources to the monitoring process. Therefore, the more information which flows into the market, the more information is incorporated in the stock price.

Along the same lines, Greenwood and Jovanovic (1990) argued that well-functioning financial markets, where information was diverse, cheap and easy to acquire, would promote the acquisition and dissemination of information and, hence, would improve the efficiency of allocating resources. With liquid financial markets, it is easy for investors to make profits from monitoring and obtaining information about firms before the information becomes widespread and the stock prices change (Kyle, 1984). In turn, this stimulates investors to research, monitor and acquire more information about firms leading to an improvement in resources allocation and spurring the rate of economic growth.

On the other hand, since stock prices provide shareholders with key signals regarding corporate investment decisions (Grossman, 1976, Grossman and Stiglitz, 1980, Diamond and Verrecchia, 1982, Pagano et al., 1998, Morck et al., 2000), the efficiency of the financial markets plays an important role as a determinant of stock prices which affects resources allocation and the rate of economic growth. Caprio Jr and Demirguc-Kunt (1998) pointed out that prices, quoted in the stock markets, revealed information about public firms to participants which made investment in public firms less risky and, thereby, increased the firms' ability to obtain long –run capital resources. Moreover, Holmström and Tirole (1993) and Subrahmanyam and Titman (1999) presented a model in which a well-functioning stock market offered more informative stock prices leading to better management decisions and, thereby, increased the efficiency of allocating resources.

Again opinions differed, since well-functioning financial markets, through pricing process, gathered and disseminated information about firms and managers. Stiglitz (1985, 1994b) indicated that well-functioning financial markets which spread information easily and quickly through changes in stock prices, created free-rider problems which reduced investors' incentives to allocate more resources in order to monitor and obtain information about firms since they could obtain these pieces of information through monitoring the stock prices.

3.2.4 Exertion of Corporate Control

A theoretical debate exists about the impact of the financial markets on corporate control and how a well-functioning financial market can affect an individual's incentives to exercise corporate control. On the one hand, well-functioning financial markets can alleviate principal-agent problems and, thereby, improve the efficiency in allocating resources and spurring the economic growth by means of tying manager compensation to stock prices or takeover threats. Diamond and Verrecchia (1982) and Jensen and Murphy (1990) argued that the inclusion of stock prices in the managerial incentive contract helped to align the interests of both managers and shareholders. Hence, managers would have incentives to maximize the firm value and, thereby, to increase the stock prices which would benefit both managers and shareholders. Moreover, Laffont and Tirole (1988) and Scharfstein (1988) indicated that an efficient stock market, which eased corporate takeover processes, could alleviate the principal-agent problem and, through takeover threats, bring managers and owners (shareholders) into line with each other. Managers have good incentives to work hard and maximize the firm value in order to avoid takeover threats.

On the other hand, although financial market can encourage shareholders to exert corporate control, Stiglitz (1985) gave the following four reasons why takeover threats would not be an efficient mechanism:

- (i) Firstly, insiders (managers of the firm) have more information about the firm's performance than outsiders. Therefore, it is difficult for outsiders to assess whether or not the firm is being managed efficiently. Insiders are willing to sell their shares if the firm, attempting the takeover, will pay a high price. Therefore, takeover processes are successful and take place only when the firm, attempting the takeover, pays too much.
- (ii) In order to make a takeover bid, it is costly for firms to undertake research to identify which firms are not managed efficiently and undervalued. If this bid undervalues the firm's true value and inability to keep information secret, this gives a signal to other firms to bid against it and leads to a higher takeover cost which reduces the expected profits to zero. Moreover, firms, which allocate part of their resources to undertake the researches, have reduced expected profits.

- (iii) If the shareholders expected that the market value of their shares would increase due to the takeover process, in such circumstances shareholders, who have not sold their shares, would get a free ride. Since each shareholder thinks his action will not affect the results (whether or not the takeover process will take place). However, if the shareholders think the takeover process will lead to a reduction in the value of their shares, then, they will have strong incentive to sell their shares. Consequently, the value-decreasing takeover processes would be easy and successful, whereas the value-enhancing takeover processes would fail.
- (iv) Current managers are in a good position which enables them to take harmful strategic decisions, such as golden parachutes; antitrust violations; and contingent sales of the firm's assets, which either prevent or hinder the takeover process.

3.2.5 Ease of Mobilization of Savings

Regarding the mechanism through which the financial markets may affect saving mobilization, Greenwood and Smith (1997) contended that efficient and liquid financial markets improved savings mobilization through lowering the cost of mobilizing savings; spurring the allocation of capital to its highest return projects; and fostering specialization in particular long-run projects which required, at initial levels before yielding profits, a large amount of capital injection for a long period of time. Thereby, these enhance the efficient allocation of economic resources and prosper long-run economic growth. In contrast, using different measures, Mayer (1988) indicated that a well-functioning financial market was not a major source for corporate finance. However, the most important source of corporate finance is retentions of profits and the second largest source is debt finance, whereas new equity issues come in the third place with the smallest portion of corporate finance.

3.3 The Causal Relationship of Finance-growth Nexus

An extensive amount of empirical literature indicated that there was a positive correlation between financial development and long-run economic growth (Fry, 1995). However, there was much debate regarding the causal relationship between financial development and economic growth which demonstrated considerable variations across countries and stressed the institutional factors as a key determinant of this relationship (Arestis and Demetriades, 1997).

Patrick (1966) investigated three alternative hypotheses which might be possible for the causal directions between financial development and economic growth. Firstly, there is the “supply-leading view” in which the causal relationship runs from financial development to economic growth. Therefore, increasing the supply of financial services and institutions would enhance the rate of real economic growth. Secondly, “demand-following view” suggests a causal relationship from economic growth to financial development. Whilst the real economy expands and grows, the demand for the financial services increases; this encourages an expansion of the financial sector. Thirdly, there is a consecutive mix of the previous two approaches which is based on the stage-of-development whereby the causal relationship between financial development and economic growth changes over the path of economic development. The relationship between financial development and economic growth will be supply-leading in the early stages of development and, as the economic development takes place, the demand-following will be more important. Besides, in advanced levels of economic development, it is more likely to have a bi-directional causality between financial development and economic growth.

Since Patrick (1966) investigated the possible directions of the causal relationship between financial development and economic growth, more researches and attentions were devoted in order to examine the pattern of causality using different econometric techniques and data samples (for instance, Demetriades and Hussein, 1996b, Demirguc-Kunt and Maksimovic, 1996, Jayaratne and Strahan, 1996, Rajan and Zingales, 1998a, Ram, 1999, Shan et al., 2001). However, since it exhibited considerable variations between countries, the causal nature of this relationship presented a source of debate between the economists (Demetriades and Hussein, 1996a).

Generally speaking, there are four possible directions regarding the causal relationship between financial development and economic growth (Graff, 2001).

3.3.1 Finance and Growth are not Causally Related

The economic growth theory was governed by real factors, whereas financial variables were deep-seated in the history of financial institutions (see for instance, Fama, 1980, Modigliani and Merton, 1958). Accordingly, there is no relationship between finance and growth and neither of them has a significant effect on the other (Ram, 1999). However, the observable correlation between these two factors is caused by another

economic aspect. For instance, although each of them follows its own logic and path, whilst the economy grows, its financial sector grows at the same time. Lucas (1988b) and Singh (1997) indicated that the financial system did not matter for economic growth and that financial development might reflect the enhancement of economic development. Moreover, many development economists ignored the role of finance. Lucas recorded that “I believe that the importance of financial matters is very badly over-stressed in popular” (1988b, P. 6). Moreover, Chandavarka stated that “none of the pioneers of development economics, including three Nobel Laureates (Bauer, Colin Clark, Hirschman, Lewis, Myrdal, Prebisch, Rosenstein-Rodan, Rostow, Singer, and Tinbergen), even lists finance as a factor in development” (1992, p. 134).

3.3.2 Finance follows Growth: Demand-following Hypothesis

Financial institutions and capital markets evolve and change over the time in response to changes in economic growth. As economic activities evolve and expand, more capital and financial institutions are required in order to raise and pool funding for enterprises and industries as a fundamental alternative channel for corporations to start up and expand instead of depending on individual fortunes and retained earnings. Consequently, financial development is demand driven. Robinson (1952) stated that “By and large, it seems to be the case that where enterprise leads finance follows”.

Many economists (see for example, Chandavarkar, 1992, Gurley and Shaw, 1967, Jung, 1986, Liang and Teng, 2006, Lucas, 1988b, Romer, 1990, Stern, 1989), emphasised the demand-following hypothesis. Moreover, Kar and Pentecost (2000a) examined the relationship between financial development and economic growth in Turkey. They argued that, in Turkey’s case, economic growth caused financial development. However, their results were sensitive to the choice of financial development indicators.

3.3.3 Finance affects Growth: Supply-leading Hypothesis

A large body of empirical studies indicated that the direction of causality ran from financial development to real development. Higher levels of financial development were conducive to higher rates of economic growth (see for example, McKinnon, 1973, Darrat, 1999, Christopoulos and Tsionas, 2004, King and Levine, 1993a, Fase and Abma, 2003, King and Levine, 1993b, Levine et al., 2000b, Neusser and Kugler, 1998, Rousseau and Vuthipadadorn, 2005). However, financial development is only one factor

amongst many other factors which affects the rates of economic growth. Thereby, a well-functioning financial system is considered to be a necessary but not a sufficient factor for economic growth.

Inadequate financial services and institutions can be seen as one of the major obstructions to economic growth in developing countries. Therefore, many economists adopt the assumption that a well-functioning financial sector is considered to be a key factor amongst many other growth-inducing factors. Provided that there are no real impediments to economic growth, a well-functioning financial system improves the mobilization and pooling of savings; the acquisition of information; provides risk diversification; and monitors investments. Hence, financial development induces high and sustained rates of economic growth.

Bencivenga et al. argued that efficient financial markets could boost a borrower's capacity leading to more trading efficiency in the financial sector and, hence, the level of per capita income. They stated that "Industrial revolution had to wait for the financial revolution" (1996, p. 243). In addition, they indicated that financial system development might spur the rate of economic growth through enhancing market liquidity. Moreover, Schumpeter (1911) argued that services, provided by financial intermediaries, were very important for technological innovation and economic growth and, hence, through funding the productive investments, financial markets could stimulate innovation and future growth. In other words, financial development is important for economic growth.

In contrast, financial development might be an obstruction to economic growth and might affect the economic growth adversely. However, the causal relationship still runs from financial development to economic growth. In 1819, John Adams, the second President of the United States, stated that "banks have done more harm to the morality, tranquillity, and even wealth of this nation than they have done or ever will do good". Some other economists (for instance, Diamond and Dybvig, 1983b, Krugman, 1995, Singh, 1997) argued that financial development might have a destabilizing effect on financial overtrading leading to financial crises and financial markets' volatility.

3.3.4 Feedback Hypothesis: Bi-relationship

Generally speaking, the relationship between financial development and economic growth was examined extensively in two different periods. Before the 1990s, most

economists, such as Goldsmith (1969), McKinnon (1973), and Shaw (1973) amongst many others, reported a positive correlation between financial development and growth rates of per capita income (economic growth). After the 1990s, the relationship between financial development and economic growth was examined based on endogenous growth theory which took into account financial intermediaries as endogenous variable determinants within the growth model.

As a result of the evolution in the growth theories in the early 1990s, economists (such as, Greenwood and Jovanovic, 1990, Bencivenga and Smith, 1991, Saint-Paul, 1992, King and Levine, 1993a, Bencivenga et al., 1995, Greenwood and Smith, 1997, among others) introduced new types of endogenous financial-growth models which took financial institutions into consideration. These models shed light on the role of financial intermediation in improving the efficiency of allocating resources and, hence, in increasing economic growth. In contrast to the McKinnon and Shaw school, which supports the supply-leading view, endogenous growth models suggest a mutual relationship between financial development and economic growth. On the one hand, a higher level of financial development reduces informational frictions and improves the efficiency of resource allocation and, in turn, this enhances capital accumulation and economic growth. On the other hand, an advanced level of economic development encourages more demand for financial services and institutions leading to an increase in financial intermediaries and financial markets.

Using an endogenous growth model, Boyd and Smith (1998) indicated that financial development affected and was affected by the level of development in the real economy. In the same vein, Demetriades and Hussein (1996b), Luintel and Khan (1999a) and Yucel (2009) indicated that, for different samples of developing countries during different periods of time, there was a reciprocal causality between financial development and economic growth. Furthermore, using an autoregressive distributed lag (ARDL) approach and Engle-Granger causality for Pakistan during the period from 1971 to 2006, Shahbaz et al. (2008) declared that there was bi-directional causality between stock market development and economic growth.

3.4 Empirical Literature

Generally speaking, based on data and the econometric methodology used, the empirical literature, which investigated the relationship between financial development and economic growth, can be classified broadly into three main groups: pure cross-section studies; panel studies; and time series studies.

3.4.1 Pure Cross-section Studies

Numerous cross-section studies, which examined the relationship between financial development and economic growth by using different data sets; country samples; and econometric techniques, concluded that there was a positive and significant relationship between financial development and economic growth (Demirguc-Kunt and Levine, 1996a, Demirguc-Kunt and Levine, 1996b, Demirguc-Kunt and Maksimovic, 1996, Goldsmith, 1969, King and Levine, 1993a, King and Levine, 1993b). Goldsmith (1969) run annual data for 35 counties over the period from 1949 to 1963. The results showed a positive relationship between financial development and economic growth. However, it was statistically weak since the correlation coefficients were negative and low for developed countries.

King and Levine (1993c) used cross-sectional and pooled data for 80 countries over the period from 1960 to 1989 to investigate the validity of Schumpeter's view "creative destruction"; according to which innovations subrogate old production techniques and goods with better and more developed techniques, commodities and services. In other words, they investigated whether the higher levels of development in the banking sector were correlated positively with the growth rate of GDP per capita; the rate of physical capital accumulation; and the efficiency of capital allocation. Their results supported the Schumpeter view that services, provided by the financial sector, would promote the rate of economic growth through increasing the rate of capital accumulation and the average productivity of capital. However, the majority of the researches in traditional growth theories, Neo-Classical and Keynesian theories, focused on banking sector development as a traditional intermediation channel (for example; King and Levine, 1993a, King and Levine, 1993b).

Over the last three decades, there has been a notably increasing intermediation role of the stock markets in the world, especially in developing countries. As a result, a large

body of empirical researches scrutinised the role of the stock markets in stimulating the rate of economic growth. Furthermore, influential economists, such as Roubini and Sala-i-Martin (1992); Atje and Jovanovic (1993); Demirguc-Kunt and Maksimovic (1996); and Demirguc-Kunt and Levine (1996a, 1996b), stressed the stock markets' positive impact on economic growth.

Roubini and Sala-i-Martin (1992) examined the relationship between the level of financial development; inflationary finance; and the long-run endogenous growth rate of a large cross section of countries. They pointed out that various measures of financial repression policies had negative impacts on the rate of economic growth. Moreover, using the constrained OLS regression for a large number of countries, Atje and Jovanovic (1993) argued that stock markets' development had a substantial effect on both the level and the rate of growth of economic activity. In addition, using aggregated firm-level data for thirty developed and developing countries in the period from 1980 to 1991, Demirguc-Kunt and Maksimovic (1996) analysed the effect of financial market development, particularly stock market development, on the firm's choices of financing. The results showed that, in developing countries, a well-functioning stock market produced a higher debt-equity ratio for firms and, therefore, more business for banks and more financial deepening and economic growth. However, in industrial countries, stock market development leads to a substitution of equity for banks credit.

Using a sample of 47 countries, Rousseau and Wachtel (2000) found stock market liquidity had a leading role in the economy and hence indicated that stock markets could improve the rate of economic growth. On the other hand, Arestis et al. (2001) used quarterly data for five developed countries and a time series approach, namely, vector error correction model, in order to investigate the relationship between stock market development and economic growth controlling for the effect of banking system development and stock market volatility. They measured the economic growth by the logarithm of real GDP; stock market development by logarithm of the stock market capitalization ratio; and banking system development by the logarithm of the domestic bank credit to the nominal GDP ratio. In addition, stock market volatility was measured by an eight-quarter moving standard deviation of the end-of-quarter change of stock market prices. Their results supported the idea that both banks and the stock market might be able to enhance the rate of economic growth. However, in this regard, banks exerted a much larger effect. Furthermore, Arestis et al. (2001) emphasised the

importance of both the banking sector and stock market in promoting economic growth. However, the ultimate impact of banking sector development is much higher when compared to the impact of stock market development which had been exaggerated by empirical studies employing cross-country growth models.

Levine (2002) showed that there was a positive relationship between overall financial system development and economic growth. However, there was no supporting evidence for either a bank based or a market based view. This was consistent with the Demirgüç-Kunt and Maksimovic (1998); Levine and Zervos (1998b); and Rajan and Zingales (1998a) whose point of view was that stock market was complementary with the banking system and each carried out different roles inside the economy.

Most cross-section empirical work reported a significant relationship between financial development and economic growth. This was based on sensitivity analysis and robustness checks for their findings by using different proxies for financial development; condition information set; dummy variables; sub-samples; and estimation techniques (King and Levine, 1993a, King and Levine, 1993b, Levine and Zervos, 1998b, Rajan and Zingales, 1998a). However, using empirical evidence Levine and Renelt (1992) indicated that results from cross-section studies, which examined the finance-growth nexus, were fragile and unreliable since trivial changes in the conditioning information set in the growth model resulted in considerable changes in the empirical results.

By using full data over the period from 1960 to 2004 and two subsamples, Rousseau and Wachtel (2011) scrutinised the validity and robustness of the classic findings on the cross-sectional relationship between financial development and economic growth. The results for the whole data set and the first subsample, 1960–1989, indicated that financial development and economic growth were correlated positively. Whilst in the second subsample, 1990–2004, the relationship turned out to be insignificant. They argued that the reason for the change in this relationship could be the financial crises resulting from the financial liberalisation policies which several countries implemented during the 1990s. These financial policies resulted in excessive financial deepening; credit expansion; and weakening the financial sector which led to financial fragility and crises.

Furthermore, cross-section studies could be subject to the endogeneity problem and country specific effects. Financial structures, financial policies, quantity and the quality

of financial services, financial regulations, the wider institutional structure, and country specific factors vary between countries. Hence, these differences between countries could affect the causal relationship between financial development and economic growth differently.¹⁰ Therefore, cross-section studies might not be able to address the question of causality and the relationship between financial development and economic growth (Arellano and Demetriades, 1996, Demetriades and Hussein, 1996b, Shan, 2005).

3.4.2 Panel Data Studies

In recent years, economists applied extensively panel estimation techniques which allowed them to take into account the time dimension in order to overcome the econometric shortcomings related to pure cross-section studies. Similar to cross-section studies, a large number of panel studies reported financial development's positive effect on economic growth using different panel techniques and data set (see for example; Barajas et al., 2013, Beck and Levine, 2004a, Christopoulos and Tsionas, 2004, Demirguc-Kunt and Maksimovic, 2002, Leahy et al., 2001, Rajan and Zingales, 1998a, among others).

Leahy et al. (2001) used dynamic panel regression techniques to see how financial sectors affected the efficiency of resource allocation and economic growth in OECD countries. Their findings indicated that, through the accumulation of fixed capital investment, financial development had a positive impact on the rate of economic growth. Furthermore, the results emphasised strongly a positive and significant relationship between the legal framework, legal enforcement and transparency in the financial sector and the efficiency of channelling funds to research and development projects; technological progress; and new productive investment leading overall to more economic efficiency. Moreover, Carlin and Mayer (2003) argued that there was a strong relationship between the institutional structure of the financial system; firm's characteristics; and economic growth. Between 1970 and 1995, in 14 OECD countries, they tested the relationship between investment and growth in 27 industries in order to analyse the interaction between the institutional factors and the industrial characteristics. In different countries, they found a strong positive relationship between the country's financial structure; industrial characteristics; and the industrial growth.

¹⁰ The wider definition of institutional structure includes both financial and government institutions since government effectiveness - the effectiveness of the institutions, which implement financial policies, affect the outcomes of financial policies inside the economy.

Some other studies tried to examine the issue of finance-growth nexus at the micro level by using industry and/or firm data within a panel regression framework. By using industry level data for 41 countries over the 1980s along with OLS and panel data fixed effect econometric techniques, Rajan and Zingales (1998a) investigated whether industrial sectors which relied heavily on external finance grew faster in countries with more developed financial sectors. They contended that a well-functioning financial system would minimise market frictions and would provide firms with funds at a lower cost and, thereby, promote formation of new projects and/or the expansion of existing firms. These results indicated that, through easing the external finance constraints, a more developed financial system had a positive impact on fixed capital formation and a firm's growth.

In addition, by using firm level data for the largest publicly traded manufacturing corporations in forty countries during the period from 1989 to 1996, Demirgüç-Kunt and Maksimovic (2002) examined how, across countries, a legal framework and the structure of the financial sector inspired firms' growth. The findings illustrated that, although financial development improves firm's access to external finance and, hence economic growth, financial structures failed to explain the differences in the firms' growth and indicated that services provided by the overall financial system, the stock market and banking sector, were very important for their growth. The proportion of firms, which grow at rates which cannot be self-financed, is related positively to the overall development of the financial system. Whilst stock market development is connected to long-term finance, banking development is connected to short-term finance.

Furthermore, in order to avoid the spurious regression problem, Calderón and Liu (2003) utilised Geweke's decomposition test and panel VAR techniques on pooled data for 109 developing and developed countries over the period from 1960 to 1994 to examine the relationship and direction of causality between financial development and economic growth. They reported a mutual relationship between these two variables. However, the impact of financial development on economic growth is higher in developing countries than in developed economies. In the same vein, Christopoulos and Tsionas (2004) suggested the use of panel unit roots and a panel co-integration approach to avoid spurious results. By utilising panel data for 10 developing countries over the period from 1970 to 2000, they examined the co-integration relationship and causality

direction between financial development and growth. The results for dynamic panel data and a fully modified OLS indicated the existence of long-run co-integrated relationship between finance and growth where the causality ran from finance to growth. However, in the short-run, there was no evidence of causality between these two variables.

By using OLS and Generalized-Method-of Moments (GMM) techniques, Beck and Levine (2004b) tested the effect of stock market and banking sector development on economic growth in 40 countries over the period from 1976 to 1998. They found that overall financial development correlated positively with economic growth. In addition, both the development of the stock market and the banking sector contributed to economic growth. These findings suggest that the stock market offers financial services different from those provided by banks. In other words, the stock market and banks are more likely to be complementary rather than substitutes.

On the other hand, by using cross-country and GMM econometric methods during the period from 1960 to 2010, Arcand et al. (2012) examined whether there was a threshold after which the positive impact of financial development on economic growth disappeared. They pointed out that financial development started to have a negative impact on economic growth when the ratio of private credit to GDP exceeded 100%. One possible explanation for the negative link could be that credit is used to finance speculative activities and bubbles rather than productive investment. Recently, Beck et al. (2012) broke down bank credit to the private sector into firm and household credit and, by using data set for 45 developed and developing countries over the period from 1994 to 2005, evaluated the impact of these two components on economic growth. They showed that firm credit was associated positively with economic growth whereas there was no link between credit to the household sector and economic growth.

Furthermore, Barajas et al. (2013) re-examined the influence of financial development on economic growth. In particular, by using GMM dynamic panel methodology and panel data set covering 150 countries over the period from 1975 to 2005, they examined whether the positive impact of financial development on economic growth varied across regions, income levels, and countries. The results provided evidence in favour of the positive impact of financial development on economic growth. However, the strength of finance-growth nexus varies across regions; income levels; and countries; oil and non-oil exporters. This positive link is small in low-income countries; oil exporting countries;

and specific regions such as the Middle East and North Africa (MENA). These heterogeneity emerge from differences in the banking sector development rather than stock market development such as different regulatory frameworks; bank ownership; degree of competition in the banking sector; and access to financial services and institutions.

Although these studies have made a significant contribution to the body of knowledge in understanding the finance-growth nexus, their results are subject to many criticisms. Firstly, these results are biased and subject to countries included in the estimation sample; the time period; the control variables included; and the econometric models used (Ang, 2008). Secondly, most of these studies adopt the view that finance leads the economic growth. Thereby, these studies specify the relationship between finance and growth based on one single equation. Therefore, this misspecification leads to conceptual problems and biased estimators. Thirdly, averaging the data periods over five or three years hides major and important features of the economic growth path over the period and eliminates any dynamic changes.

In addition, Wachtel pointed out that “efforts to hold country-specific effects constant ... [in] panel regressions could indicate a spurious aggregate relationship. The observed finance-growth relationship is due to between-country differences rather than within-country differences over time. In this case, regression results would not provide any reason to make inferences about the effects of financial deepening on growth” (Wachtel, 2004, p. 41). Besides, by using both time series data and methods alongside with dynamic heterogeneous panel approach for six countries including low and middle income countries, Arestis et al. (2010) tested the relationship between financial structure and economic growth. The results showed that data could not be pooled for these countries since panel regression techniques hid major differences across-countries.

3.4.3 Time Series Studies

In the literature, various time series approaches were used extensively to investigate the causality direction and the relationship between financial development and economic growth. The Granger causality test, co-integration approach, Vector Autoregressive framework (VAR), Vector Error Correction Model (VECM) and Autoregressive Distributed Lags (ARDL) techniques were the time series techniques which were used most commonly to examine the impact and the causality direction between financial

development and economic growth. These studies focused mainly on examining the detail of a specific country or a few countries. Hence, this allowed the relationship and the causality direction to vary across countries.

Time series approaches deal with an individual country's specificity and offer the opportunity to show and analyse the causality pattern. By using quarterly time series data from 1961Q1 to 1980Q4 for 14 developing countries, Gupta (1984) ran the first time series analysis to investigate the relationship between financial development and economic growth. The results suggested a positive relationship between financial development and economic growth with the causality direction running from financial development to economic growth.

For 56 developed and developing countries, Jung (1986), used two alternative measures of financial development, namely, the currency ratio and the monetization ratio, within Vector Autoregressive (VAR) technique to investigate the direction of the causality between financial development and economic growth. His results were inconclusive. While the currency ratio, as a proxy of financial development, supported the supply-leading hypothesis, using the monetization ratio provided evidence in favour of the demand-following hypothesis. Moreover, the results suggested that, in developing countries, the causal direction ran from financial development to economic growth, whilst, in developed countries, the causal relationship ran in the reverse direction.

Demetriades and Hussein (1996b) used annual data for 16 developing countries along with Johansen and ECM approach to examine the direction of causality between financial development and economic growth. Their results were mixed. They found little evidence in favour of the supply-leading hypothesis. While most of the countries exhibited bi-directional causality, others showed reverse causation between finance and growth. On this basis, they argued that the question of causality was country specific and could not be generalised based on cross-section studies. This was because cross-section techniques could not allow different countries, with different degrees of financial liberalisation; financial regulations; financial structures, institutional characteristics; and law enforcement to show different patterns of causality.

In the same vein, by using time series data and a Vector Auto Regression (VAR) framework, Luintel and Khan (1999a) investigated the relationship between financial development and economic growth in 10 developing countries. The results suggested

the existence of bi-directional causality between financial development and economic growth where financial development and growth correlated positively in the long-run. Furthermore, Levine and Zervos (1996, 1998a, 1998b) focused on the role for the stock market in a financial system since banks provided different services from those provided by the stock market. They contended that stock market development is correlated positively with higher economic activities.

Over the period from 1960 to 1993, Xu (2000) used a multivariate vector-autoregressive (VAR) technique to explore the impact of financial development, as measured by the ratio of total bank deposit to GDP, on investment and economic growth in 41 countries. In 27 countries, the results provided strong evidence in favour of a finance-lead-growth view. Financial development and growth were associated positively and that investment was a key channel through which finance influenced growth. Similarly, for 10 Asian countries over the period from 1950 to 2000, Rousseau and Vuthipadadorn (2005) employed Johansen co-integration, VECM and modified WALD techniques to examine the nature of the relationship and the direction of causality between financial development; investment; and growth. Their results supported the capital accumulation channel through which financial development was considered to be a key determinant for investment. However, the role of financial development, in stimulating the level of output, was weak.

Case studies were another important strand of empirical literature which used time series techniques. Luintel and Khan (1999b), Demetriades and Hussein (1996b) and Jung (1986) pointed out that the pattern and the direction of causality between financial development and economic growth varied substantially between countries. Therefore it is necessary to conduct the analysis on the basis of case studies using time series techniques in order to strengthen our understanding and depict precisely the causality pattern between financial development and economic growth.

By using, within a Vector Autoregressive (VAR) framework, annual data for Korea over the period from 1970 to 1992, Choe and Moosa (1999) inspected the relationship between the development of financial sector and economic growth. The Granger causality test results provided evidence in favour of the finance-led-growth view whereby higher levels of financial development were conducive to higher economic

growth. Furthermore, in promoting the rate of economic growth, they stressed the relative importance of financial intermediaries over stock markets.

By using Vector Autoregressive (VAR) and the Granger causality test, Thangavelu et al. (2004) applied quarterly data for Australia through the period from 1960Q1 to 1999Q4. The results indicated that the banking sector responded to the economic growth through increasing the demand for financial services, whereas stock market development was an important aspect in fuelling economic growth. Moreover, for China over the period from 1978 to 2001, Shan and Jianhong (2006) used, within a Vector Auto-regression (VAR) system, variance decomposition and impulse response function to analyse the relationship and causality direction between financial development and economic growth. The Granger causality test results rejected the finance-led-growth hypothesis and exhibited reciprocal causality between financial development and economic growth. On the one hand, the reform and development of the Chinese financial sector promotes economic growth through increasing the credit available to investment. On the other hand, rapid growth in the Chinese economy affects significantly the financial sector development and increases the demand for financial services and, in particular, bank deposit which form the solid base for credit.

By using time series data through the period from 1960 to 2001 within a VECM approach, Ang and McKibbin (2007) examined the causality direction between financial development and economic growth in Malaysia. Financial development was measured by the liquid liabilities ratio; commercial bank assets to commercial bank assets plus central bank assets, and private credit ratio (all variables expressed in logarithm). Then, using the first principal component, the financial development index was represented in the VECM model. The results indicated that financial development and economic growth correlated positively. Moreover, the Granger causality test results supported the demand-led-growth view whereby rapid economic growth rate would promote a higher level of financial development in the long-run.

Another important case study, by Yemane (2009), scrutinised the causality relationship between financial development and economic growth in the case of Kenya by using a quadvariate vector autoregressive (VAR) approach and annual data over the period from 1966 to 2005. Four conventional measures of financial development were applied to investigate the direction of causality based on Toda and Yamamoto (1995) approach,

namely, money supply (M2); liquid liabilities (M3); private credit; and total credit provided by the banking sector (all as ratio of GDP). The results indicated that three out of four of financial development proxies provided evidence in favour of a mutual relationship between finance and growth. Similarly, by using annual observations for Ireland over the period from 1965 to 2007, Adamopoulos (2010) examined the long-run relationship and causality direction between financial sector development and economic growth controlling for the positive impact of industrial production on economic growth. Two proxies of financial development were modelled in a Vector Error Correction Model (VECM), namely, the ratio of domestic bank credit to the private sector and general stock market index. The Granger causality test results revealed, on the one hand, the positive impact of economic growth on banking sector development and, on the other hand, a mutual relationship between stock market development and economic growth.

Finally, by using quarterly time series data and Johansen co-integration approach in a bivariate Vector Autoregressive model over the period from 2000 to 2009, Sackey and Nkrumah (2012) investigated empirically the link and the causal relationship between financial development and economic growth in Ghana. Their results supported the finance-led-growth view. Promoting the development of the financial sector would stimulate the economic growth rate through increasing credit availability and accessibility to the private sector. Consequently, this inspired investment which was considered to be the engine for economic growth.

In the case of Egypt, Hussain (1997) examined, by using Autoregressive Distributed Lag approach (ARDL), the relationship between financial liberalisation, financial development and economic growth over the period from 1967 to 1996. Although his empirical results indicated that financial development, measured by the ratio of private credit to the total credit, was associated positively with real GDP per capita, a 1% rise in the private credit ratio would result in a 0.17% increase in real GDP per capita. However, the results did not support the financial liberalisation hypothesis that a higher real interest rate would have a positive impact upon investment and economic growth. The real interest rate can be a double-edged sword. On the one hand, a higher interest rate has a positive impact on financial saving and, hence, investment by increasing the availability of credit. On the other hand, a higher interest rate means a higher borrowing cost and lower expected returns on investments. In the case of Egypt, a higher interest

rate, brought about by financial liberalisation policies, had ultimately a negative impact on investment.

Moreover, by using a Granger-causality test within a bivariate ECM framework, Khalifa Al-Yousif (2002) explored the relationship and the direction of causality between financial development and economic growth in 30 developing countries including Egypt over the period from 1970 to 1999. Two alternative measures for financial development were employed, namely, the ratio of currency to narrow money and the ratio of broad money to GDP. For Egypt, the empirical analysis provided mixed results. Using the ratio of currency to narrow money showed no causality between finance and growth. Whereas the monetization ratio supported the view that financial development and economic growth were determined jointly in the long-run. However, testing the causality direction in a bivariate model tends to be misleading since the model is more likely to be miss-specified (Abu-Bader and Abu-Qarn, 2008). Furthermore, the literature reported a lot of criticisms regarding these two measures of financial development.

Another important study by Abu-Bader and Abu-Qarn (2008) investigated the link and the causality between financial development and economic growth in the case of Egypt during the period from 1960 to 2001. Four different proxies of financial development were employed to test the causality direction in Johansen co-integration and a vector error-correction (VEC) framework, namely, the ratio of money stock (M2); the ratio of money stock minus currency in circulation; the ratio of bank credit to the private sector (all variables were expressed as ratio of GDP); and the ratio of credit issued to non-financial private firms to total domestic credit. The results indicated that financial development and economic growth correlated positively in the long-run. Moreover, the Granger causality test provided evidence in favour of a mutual causal relationship in which financial development and economic growth were determined jointly. A well-developed financial system promotes economic growth through both higher capital accumulation and efficiency of investment. Meanwhile, rapid growth would stimulate the demand for financial services and institutions. It is worthwhile noting that the previous study focused mainly on the effect of traditional financial intermediaries, namely the banking sector, on economic growth without taking into account the role of the stock market.

Finally, Bolbol et al. (2005) examined the link between financial structure and total factor productivity (TFP) in Egypt over the period from 1974 to 2002. In other words, whether a bank-based or a market-based financial system is more conducive to the economic growth? The bank-based system is represented by the ratio of private credit to GDP and the ratio of commercial banks assets to the sum of commercial banks and central bank assets. On the other hand, the market-based system is measured by the market capitalization ratio and the turnover ratio. Their findings showed that bank-based indicators had a positive impact on TFP growth only at higher levels of GDP per capita whilst market-based measures had a more pronounced influence on TFP growth.

3.5 Concluding Remarks

This chapter reviewed the theoretical and empirical literature on the relationship between finance and growth and the pattern of causality. According to the literature and based on the above discussion of different main streams of thought on the association between financial development and economic growth, it is obvious that there is no clear cut evidence about the nature of the relationship and the direction of causality between finance and growth. Also, evidences from the empirical literature are inconclusive and questionable.

Although cross-section and panel studies have made a significant contribution to the body of literature in understanding the finance-growth nexus, the results of these studies are subject to many criticisms. On the one hand, cross-section studies can be subject to the endogeneity problem and country specific effects. Financial structures, financial policies, quantity and the quality of financial services, financial regulations, the wider institutional structure, and country specific factors vary between countries. Hence, these differences between countries affect differently the causal relationship between financial development and economic growth. Therefore, cross-section studies may be unable to address the question of causality and the relationship between financial development and economic growth (Arestis and Demetriades, 1996, Demetriades and Hussein, 1996b, Shan, 2005).

On the other hand, there are three main criticisms of panel studies. Firstly, their results are biased and subject to countries included in the estimation sample; the time period; the control variables employed; and the econometric models used (Ang, 2008).

Secondly, most of these studies adopted the view that finance led the economic growth. Thereby, these studies specified the relationship between finance and growth based on one single equation. Therefore, this misspecification leads to conceptual problems and biased estimators. Thirdly, averaging the data periods over five or three years hides major and important features of the economic growth path over the period and eliminates any dynamic changes. Besides, Arestis et al. (2010) tested the relationship between financial structure and economic growth by using both time series data and methods alongside with dynamic heterogeneous panel approach for six countries including low and middle income countries. The results showed that data could not be pooled for these countries since panel regression techniques hid major differences between the countries.

As regards time series and case studies, the theoretical and empirical studies, which investigated the relationship between financial development and economic growth in the case of Egypt, were occasional and insufficient. The theoretical studies were limited to descriptive analyses whereas the empirical studies were subject to a number of deficiencies such as limited data availability and, hence, their findings; conclusions; and policy implications could be misleading.

4 Financial Structure and Economic Development: Literature Review

4.1 Introduction

Chapter four considers another key aspect of the relationships between finance and growth. Specifically, this chapter assesses empirically and theoretically the competing views in the literature on the financial structure and economic development. Generally speaking, the literature acknowledged five competing theories. These are, namely: the bank-based view; the market-based view; the financial services view; the law and finance view; and, finally, the new structuralism view.

The relationship between the financial structure and economic development has received considerable attention over the last century. The ways in which economic development influences the financial structure and vice versa are of paramount importance for policy makers. However, theory provides conflicting views regarding the link between the structure of the financial system and economic growth, whether stock markets and banks are complements or substitutes, or whether one is more conducive for the economic growth than the other.

According to related literature and based on the analysis of financial structure in advanced economies, two major structures of the financial system have been identified: the bank-based and market-based systems. For the relative importance of these two systems, see (Allen and Gale, 1999a, Arestis et al., 2001, Demirgürç-Kunt and Levine, 2004, Levine, 2002, Levine, 2003b, Singh, 1997). On this basis, financial systems have been divided into two main groups based on the type of institutions, constituting the financial system: bank-based financial system and market-based financial system (Mayer, 1987). In the former, financial intermediaries play a major role in the market by mobilizing savings, allocating capital resources and facilitating hedging, pooling, and providing risk diversification (Allen, 2000, Levine, 2002). Moreover, when there is a close tie between banks and industrial firms, companies' ownership is divided into small numbers of shareholders with large share stakes. There will be few mergers and takeovers since firms rely heavily on bank loans, thereby banks exert monitoring and corporate controlling function inside the economy.

In contrast, the market-based financial system is characterized by an advanced stock market and banking system, in which banks still play a key role in the allocation of funds. However, it remains less important than the stock markets since firms rely mainly on external fund raised from the stock market. Moreover, mergers and takeovers processes were very active in market-based financial systems (like UK and USA) where stock markets through high liquidity and risk diversification provided more fund for mergers and takeovers, and this was viewed as a punishment to incompetent managers with inefficient policies, and thereby encouraged monitoring and corporate controlling function in the economy (Stulz, 2001). However, mergers and takeovers do not play a significant role in bank-based financial systems (like Germany and Japan) because of the close tie between banks and firms which protect firms against mergers and takeovers processes (Arestis and Demetriades, 1996). Furthermore, Hellwig (1991) points out that the main distinction between these two types of financial structure is the institutional framework rather than the financial instruments they provide. While financial markets are very competitive and to some extent have a large number of participants, banks are more likely to individually negotiate financial contracts separately with borrowers who rarely deal with more than a few number of banks at the same time.

During the last few decades, economists have long debates concerning the merits of market-based versus bank-based financial system. The classification of the financial systems into bank-based and market-based could be traced back to Gerschenkron (1962) and Goldsmith (1969), and since then they have been extensively used in the literature. For over a century, a large body of empirical literature, that examined UK and USA as market-based systems and Germany and Japan as bank-based systems (see for example, Arestis et al., 2001, Hoshi et al., 1991, Morck and Nakamura, 1999) using panel and cross country studies indicate that financial structure is a matter for the economic growth. In contrast, others (see for e.g., Beck and Levine, 2004a, Levine, 2002) argue that the financial structure is irrelevant to the economic growth. Moreover, Beck et al. (2000a) points out that these four countries have similar patterns of the economic growth rates with a different financial structure. Thus it is very hard to relate variations in the growth rate to variations in the financial structure across these countries.

In contrast to the bank-based and market-based views, a large number of empirical papers investigating the relationship between financial structure and economic growth argue that the structure of the financial system is irrelevant and does not matter for the

economic growth. Indeed, what matters for the economic growth is the overall level of financial development (e.g. see, Beck et al., 2000b, Demirgüç-Kunt and Levine, 2004, La Porta et al., 2000, Levine, 2002, Levine et al., 2000a, Levine et al., 2000b, Rajan and Zingales, 1998a). It is argued that “financial institutional arrangement has its advantages and disadvantages. Thus the composition of various financial institutional arrangements in the financial system will affect its efficiency in mobilizing savings, allocating capital, and redistributing risks” (Lin et al., 2009, P. 13).

Another strand of the literature emphasises the new structuralism approach.¹¹ They argue that in early stages of economic development the financial structure is more likely to be bank-based and dominated by a large number of small banks that provide their financial services to a large number of small-size manufactures and entrepreneurs. Conversely, in advanced stages of economic development, the financial system is expected to be dominated by the financial markets.

This chapter begins with reviewing the financial structure literature. This is followed by a discussion of the theory in which it will be argued that the relationship between financial structure and economic development changes and evolves over time and through the path of economic development.

This chapter assesses empirically and theoretically the competing views in the literature of financial structure and economic development. Generally speaking, five competing theories have been acknowledged in the literature, namely: the bank-based view, market-based view, financial services view, law and finance view, and finally the new structuralism view. The chapter ends up with summary and concluding remarks.

4.2 Literature Review

Financial systems can be viewed as addressing three main problems: asymmetric information which leads to moral-hazard and adverse-selection problems, uncertainty

¹¹ Note that the new structural approach differs from neo-structuralist view. Whilst the former approach argued that a country's financial structure would change over the path of economic development, as the financial structure is dynamic and determined endogenously by the demands from the real economy for specific types of financial services. The latter view placed more emphasis on the role of informal financial markets as the main credit suppliers in the context of largely market-driven catch-up development. Since, the curb (informal) financial markets are working more efficient than official financial markets because they are not subject to the reserve required ratio which consider as a leakage from the intermediation process.

which is very severe in the free market economy, and principal-agent relationship problems that resulted from financial markets imperfections (Arestis and Sawyer, 2008b). According to Stigler (1967) there are three sources of capital market imperfections:

- (i) Inability of borrowing fund cheaply and accessing the capital market resulted in failure of capital to flow easily into the higher rate investment, leading to inefficiency of capital allocation.
- (ii) The presence of oligopoly or monopoly power in the capital market, where lenders are able to get extortionate returns, could lead to severe inefficiencies in capital allocation.
- (iii) Capital market inefficiency due to the existence of information costs, the cost of acquiring knowledge about the capital markets.

Moreover, (Stulz, 2001) illustrates another two key market imperfections: firstly, hidden information which resulted from asymmetric information between managers and shareholders where managers have more information about a firm's activities and policies more than shareholders do. The second imperfection is hidden actions where shareholders and investors can't monitor all actions taken by managers. Thus, the detection of market imperfections gives reasons for the existence of financial systems and institutions, whether banks and/or stock markets, on the basis of their ability to ease the previous problems and reveal its beneficial role within the economy.

The principal-agent relationship is defined “as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf, which involves delegating some decision making authority to the agent” (Jensen and Meckling, 1976, P. 3). Accordingly, the costs that incurred in addressing the principal-agent problem involve the sum of the following three factors:

- (i) The monitoring costs by the principal.
- (ii) The bonding costs by the agent, and
- (iii) The residual loss measured by the decline in principal's welfare resulting from the divergence between agent's decision and the optimal decision from the principal point of view, which would maximize the principal's welfare (Jensen and Meckling, 1976).

Financial institutions and financial markets involve these types of relationships. The most obvious example is that between shareholders and managers who are in some sense deemed to be acting on behalf of the shareholders. In particular, the principal-agent relationships are inevitably arising in terms of the financial contracts. One obvious example is the significance of monitoring cost. The point is that in these financial transactions there is a principal (shareholders) who engages managers (agents) to act effectively on their behalf, and as a result, these issues of principal-agent relationships arise.

Economic agents depend on financial intermediaries to ease the information and transaction cost problems, along with managing the liquidity risk and allocate capital resources efficiency. Informational asymmetries, which accompany all kinds of financial transactions and contracts in financial markets, coupled with weak prudential regulations which were viewed as a major factor for different types of moral-hazard problems resulting in higher risk-taking by both financial institutions and investors, leading to financial fragility and banking crises (Arestis et al., 2003a). Franklin Allen and Douglas Gale (1997) point out that the oil shock in the early 1970s affected individuals in countries with market-based more adversely than bank-based financial systems in which individuals' claims were fixed in nominal terms and financial intermediaries were able to absorb and digest the shock instead of passing it to individuals.

This type of macroeconomic shock severely affected all types of assets within the economy, and was considered as a non-diversified risk since investors could not avoid it by holding small amount of shares in different projects. In other words, there was a cross-sectional risk sharing through a diversified portfolio. However, these shocks can be accommodated through intertemporal smoothing of risk and splitting up the risk over time. Thus, different financial systems structures accommodate different types of risk through providing different risk-sharing opportunities. For instance, a bank-based financial system offers a better intertemporal risk sharing through long-lived intermediaries; while a market-based financial system provides a better cross-sectional risk sharing by offering a wide range of financial products.

In the context of financial structure literature, some factors have been introduced to explain the differences of financial structures across countries and over time. Hence, this

chapter empirically and theoretically assesses the competing view in the literature, where five challenging theories have been acknowledged: the bank-based view, market-based view, financial services view, law and finance view, and finally the new structuralism view.

4.2.1 The Bank-based View

The proponents of the bank-based view on the one hand highlight the positive role of banks, and on the other hand, they stress the shortcomings of the market-based view. Levine denotes the positive advantages of bank-based financial systems in promoting the growth rate “through; (i) acquiring information about firms and managers and thereby improving capital allocation and corporate governance, (ii) managing the cross-sectional, intertemporal, and liquidity risk and consequently enhancing the investment efficiency and economic growth, (iii) mobilizing capital to exploit economies of scale” (Levine, 2002, P. 2). Moreover, Arestis and Demetriades (1996) argue that bank-based financial systems are in a better position than market-based systems to tackle asymmetric information, uncertainty, and principal-agent relationship problems that resulted from financial markets imperfections.

Banks have an advantage over financial markets in easing informational asymmetry in the market since banks encourage and spur economic agents to collect and process information more than financial market. Banks can ease market distortions resulting from asymmetric information by establishing strong, long-run relationships with entrepreneurs, monitoring managers and firms in order to control moral hazard, exert corporate control, and facilitate effective monitoring of firms activities, which enhance resources allocation efficiency and corporate governance (Luintel et al., 2008).

Banks, as specialised financial institutions, have the capability to collect and process information about managers and firms at a lower cost and get benefit from economies of scale in producing a wide range of information about potential borrowers, screening projects, and monitoring managers (Allen, 1990, Diamond, 1984). Moreover, the production of information at a low cost will spur banks to gather and collect more information about managers, firms and markets more than that about shareholders at the financial markets. This leads to a positive impact on credit bank allocation efficiency.

Some studies argue that the transaction cost of borrowing from banks could be lower than its counterpart resulting from issuing shares at the financial market for two factors: first, low information and transaction costs accompanied with borrowing from banks relative to financial markets, since firms do not have to bear the cost of financial auditing, security marketing and disclose their information in standard financial statements to the public. Second, the cost of borrowing capital investments from banks (loan interest rates) is lower than that at the financial markets (Lin et al., 2009). Thus, small firms lacking such information and standard financial statements are more likely to raise their capital needs through the banking systems; whereas, big corporations and innovative projects can raise their capital needs through financial markets. Bank-based financial systems are better than market-based ones in reducing the agency costs, wherein efficient financial intermediaries act as “delegate monitoring” in acquiring and gathering information about managers and firms (Boyd and Prescott, 1986, Diamond, 1984)

Turning to the shortcomings of a market-based system, Stiglitz (1985) stresses the free-rider problem in well-developed markets which quickly reveal information and reduce the individual's incentives to acquire information about managers and firms. However, banks can avoid this problem by privatizing the information production process and establishing a long-run relationship with firms (Levine, 2002). Moreover, Bhade (1993) indicates that liquid markets may create a myopic climate in which investors can easily and competitively sell their shares, so that they have less incentives to monitor firms and exert corporate control. Finally, Grabel (1997) points out that well-functioning financial markets may inspire short-terminism and high risk speculative transactions which in turn deter the long-run investment and capital accumulation process.

In addition, some economists suggest that a more liquid stock market may harm the economic growth. For example, Bencivenga and Smith (1991) and Jappelli and Pagano (1994) show that greater liquidity in the stock market through financial integration and liberalization may reduce saving rates through reducing uncertainty and as a result harm the economic growth. Furthermore, Bencivenga et al. (1995) illustrate that greater liquidity in the stock markets may spur shareholders to reallocate their portfolios via purchasing securities on expanding current projects and far from initiating new and innovative investment projects which will reduce the real rate of investment and harm the economic growth in the future.

4.2.2 The Market-based View

The proponents of the market-based view on the one hand underscore the advantages of financial markets in promoting faster economic growth, and on the other hand, they emphasise the deficiencies of the bank-based systems. Well-functioning financial markets will be able to foster higher economic growth rate through spurring individual's incentives to monitor firms, improve corporate governance by smoothing takeovers, link managerial compensation to firm performance, and finally facilitate risk management diversification (see for e.g., Rybczynski, 1985, Levine, 1991, Holmström and Tirole, 1993, Obstfeld, 1994b, Levine, 2002, Beck and Levine, 2004a).

According to the neo-classical growth theories, a large body of empirical literatures focus on the traditional intermediation channel, banking system. However, there is more concern over the stock market in the view of the rapid growth of stock markets since the 1980s. However, there are many debates regarding the role of the stock market development in promoting the economic growth.

Many empirical and theoretical studies have emphasised the role of the stock markets as a stimulus to the economic growth. Levine and Zervos (1996, 1998a, 1998b) focus on a separate role for the stock market in the financial system, since banks provide different services from those of the stock market, and contend that a stock market development index, which is composed of size, liquidity and international integration, is positively correlated with the real economic activity.

Atje and Jovanovic (1993) and Levine (1996b) argue that there is a positive and significant relationship between stock market development indexes and economic growth. Levine and Zervos (1998b) using cross-country econometric method for a sample of forty-seven countries during the period 1976-1993, argue that stock market liquidity has significant and positive effects on the economic growth. However, Zhu et al. (2004) indicate that Levine and Zervos' results are not robust as they choose outlier countries, and as soon as we control for outliers stock market liquidity-growth nexus will disappear. Moreover, Arestis et al. (2001) show that stock market-growth relationship may have been exaggerated by empirical literatures that apply cross-country regressions.

Arestis et al. (2001), using time series econometric methods for a sample of five developed countries, indicate that the effects of banking systems are more powerful than

stock markets in promoting the economic growth and that stock market volatility has negative impacts on the economic growth. Finally, Beck and Levine (2004a) use panel econometric techniques, which allow GMM to deal with a two-way causality. They found that stock market activities represented by the turnover ratio positively and significantly affect the economic growth rate.

On the opposite side, others see that the banking systems have limited ability of risk diversification, and so they tend to be more cautious and reluctant to finance new technologies and innovative projects and thereby hamper the level of investment and long-run economic growth since sustainable economic development involves continuous injection of new and innovative technologies and products to the existing industries (Rajan and Zingales, 2003a). Financial markets offer the chance to finance such important projects and hence promote venture capital and technological progress (Singh, 1995). In fact, they provide investors the opportunity to diversify and manage the risk of new projects through distributing the cost of investment and hence sharing the risk among many investors where each of them bears a small share of risk equal to the amount he invested (Lin et al., 2009, Allen and Gale, 1999b). However, Allen (1993) points out that in comparing both the bank-based and market-based financial systems, there is no evidence that market-based financial systems, like USA and UK, have any advantage over the bank-based system, such as France, Germany and Japan, regarding the risk diversification process since banks and other financial intermediaries can spread the risk among a large number of depositors through providing loans to a wide range of diversified firms and industries.

Moreover, under some circumstances such as oligopolistic or monopolistic financial systems, where banks have a high degree of market power over firms and projects, banks, by acquiring a lot of information about firms, are capable of extracting the majority of firm's rents which hamper the firm's desire to expand and conduct profitable investments (Rajan, 1992). Furthermore, banks pay a very low interest rate to depositors which in turn have contractionary effects on credit and hence the economic growth. In addition, the close tie between main powerful banks and managers could encourage them to collude against shareholders. This would hinder the level of competition, resources allocation efficiency, exerting corporate control, and hence the economic growth rate (Hellwig, 1998).

4.2.3 The Financial-services View

A large body of empirical literature using panel and cross-section techniques at different levels indicate that the financial structure is irrelevant to the economic growth. However, it is the overall provision of financial arrangements -contracts, markets, and intermediaries- are more crucial and significant in promoting economic growth. For example, at cross-country level see (Demirguc-Kunt and Levine, 1996b, Levine, 2002, Levine, 2003a, Beck and Levine, 2004a), and at industry and firm level see (Beck and Levine, 2002, Demirguc-Kunt and Levine, 2004, Demirguc-Kunt and Maksimovic, 2002). These authors argue that banks and financial markets are different components of the financial system, and provide different financial services. In particular, banks are better at easing a transaction cost and informational asymmetry that associates with market imperfections, spur collateralized investment and low risk management. On the other hand, stock markets provide long-term commitments, finance higher-risk and innovative projects, and offer a high degree of risk diversification (Allen, 2000).

The existing empirical literature does not help or support either type of the financial structures in terms of endorsing the economic growth. However, cross country and industry studies promote the positive association between the economic growth and the overall level of financial system development rather than the financial institutions structure (Demirguc-Kunt and Levine, 2004, Levine, 2002).

Beck et al. (2000a) use a different data set at country, industry, and firm levels alongside different approaches to test the relationship between the financial structure and economic development across countries at different dimensions. Results indicate that the financial structure is irrelevant; it does not explain differences in the economic growth rate pattern, industrial performance or firm expansion across countries. In other words, economies and industries that rely heavily on the external finance do not grow rapidly in either bank-based or market-based financial systems. Indeed, it is the overall level of financial development and the legal framework that matter and influence the aforementioned factors. At a cross-country level, Beck and Levine (2004a) examine the effect of stock market and bank development on the economic growth, using a panel data set for 40 countries during the period 1976–1998 and GMM panel technique where data are averaged over five-year intervals and stock market development and bank development measured by the turnover ratio and bank credit ratio respectively. Results

indicate that stock market and banks are positively associated with a higher economic growth rate and that stock markets provide different financial services from banks.

Demirguc-Kunt and Levine (1996b) investigate the relationship between stock market and financial intermediaries using aggregate indices for banks, nonbanks financial intermediaries and stock markets. They indicate that as the economic development takes place and the economy grows, stock market and non-banks grow faster than the banks as a percentage of the overall financial system. However, bank assets and stock market continue growing as a ratio to GDP and as a result they conclude that stock markets and banks are complements.

Along the same lines, Levine (2003c) discusses and analyses recent empirical studies which investigate the finance-growth nexus to test whether the financial development plays a key role in enhancing the economic growth rate, using various econometric techniques: cross-country, microeconomics studies at industry, and firm level in order to explore channels through which finance affects the economic growth rate. Once more, results show that banks and stock markets are not the same since they provide different financial functions to the economy, that is, the financial services provided by banks are extremely different from those provided by stock markets.

When it comes to the industry level, Beck and Levine (2002) use data for 42 countries and 36 industries to examine the impact of the financial structure on capital resources allocation across industries. In other words, to assess whether the market-based or bank-based financial systems is better at financing the expansion of existing industries that depend heavily on external finance, easing the foundation of new firms and corporation, and enhancing the efficiency of capital resources allocation. They construct three different indicators to capture different dimensions of financial structure. Firstly, the aggregate index which is the first principal component of two variables, structure activity ratio and structure size ratio, whereas the structure activity ratio is measured as the logarithm of the total value traded over bank credit and the structure size ratio estimated as the logarithm of total market capitalization to bank credit. The second indicator reflects the regulatory restrictions on commercial banks activity, and the third represents the extent to which the state is involved in banks ownership. Results illustrate that neither the bank-based nor market-based financial system is beneficial for enhancing the economic growth. While the level of the overall financial development

alongside the efficiency of the legal system and legal enforcement are key factors for industries that depend on external finance to grow and expand faster.

Moreover at firm level, Demirgüç-Kunt and Maksimovic (2002) use firm-level data for the biggest publicly traded firms in forty countries during the period 1989-1996 to investigate the impact of country's legal and financial system structure on firms that rely heavily on external finance. They find evidence that the overall financial development and legal framework is positively associated with higher levels of firm growth, that is, both stock market and banking system development accelerate firm growth. However, they have different influences on the type of external fund that is available for a firm, while banks are involved in long-run financing, stock markets are more connected to the short-run financing. Furthermore, neither the market-based nor bank-based financial system view had been supported by the results.

4.2.4 The Law-finance View

Other studies highlighted the importance of legal factors as a key determinant of the financial structure. The law and finance approach considers finance as a set of contracts that are defined by the legal rights and quality of legal enforcement. In this sense, corporate law and legal factors play an important role in the development of financial system. Furthermore, the classification of a country's financial system based on legal factors is much better and provides clear understanding for the differences of financial systems across countries than the distinction between bank-based and market-based financial systems. So therefore, a well-functioning legal system facilitates the operation of both banks and stock markets. Thereby it is the overall level and qualities of financial services provided by the financial system – as determined by the legal system – that improves the resources allocation efficiency and enhances the economic growth (Levine, 2002).

La Porta et al. (1998) use a sample of forty-nine countries, which are divided into civil-law countries and common-law countries with respect to the legal origins. They examine the effect of legal factors such as the legal protection of shareholders and creditors, legal origins, and the quality of legal enforcement, on financial system development and economic growth. In terms of the legal protection of shareholders and creditors, common-law countries have the strongest, while civil-law countries have the

weakest. They argue that legal origins affect the quality of legal enforcement. Common-law countries have the best quality of legal enforcement, while civil-law countries have the worst. Moreover, La Porta et al. (1997) indicate that legal factors and legal protection rules for investors affect the financial structure. While there is no difference between countries in terms of banking system development, civil-law countries tend to have less developed capital markets compared with common-law countries.

Berglöf and Thadden (1999) indicate that empirical results based on the law and finance view (such as, La Porta et al., 1997, La Porta et al., 1998, La Porta et al., 2000) are limited and misleading. These empirical studies which investigate corporate governance focused only on shareholder concentration and corporate law, namely the protection of external financer while ignoring other stakeholder and relationship, in particular the relationship between workers and managers on the one hand and suppliers and firms on the other hand. In other words, they examine corporate governance in isolation from product and labour markets. Furthermore, Glen et al. (2000) studied the role of corporate law and legal factors in explaining financial market evolution and development during the last two decades. Their results state that corporate law and legal origin failed to illuminate financial system development in many countries and that corporate law and legal regulations follow economic changes and not the other way around.

Finally, Demirguc-Kunt and Levine (2004) address the effect of the legal framework, accounting financial reports, and political characteristics on the financial structure. They state that advanced countries with well-functioning legal systems and high standard financial statements tend to have a more market-based financial system. But developing countries with fragile legal framework and accounting system are more likely to be dominated by a bank-based financial system. However, Allen et al. (2006) provide evidence that the financial structure and the laws and legal environment are influenced by the needs and the demand from the real economy. That is, the demand from economic units at the real sector determines the development and evolution of both financial and legal systems.

It's clear now from the above discussion that there are other important factors besides the legal origin affecting financial structure-economic growth nexus. These are the institutional factors (Arestis and Sawyer, 2008b). To this end, Arestis et al. (2005)

present a holistic approach for financial system development that depends on institutional factors, namely, the institutional-centric theory, that should be taken into account when examining the relationship between the financial development and economic growth. He divides the financial system into five institutional factors which interact with each other inside the economy: norms, incentives, regulations, capacities, and organizations. These factors are key determinants for both the financial development and economic growth. He stated that “At the core of the project is the institutionalization of finance. For new financial systems to be institutionalized, they must become legitimate entities in the sense that they are embedded in the circuits of social and economic production. Ultimately for banking norms to be developmental, they need to be absorbed into the consciousness of the general population, which is more likely to happen when structures are diverse, participatory and accessible” (Arestis et al., 2005, P. 19).

4.2.5 The New-structural View

A vast body of literature that examined the role of financial structure in stimulating the economic growth rate, the relative merits of banking system versus stock markets, did not reach an agreement due to the fact that the determinants of the financial structure, political conditions, law and legal origins, cultural factors, and the association between the structure of the real economy and the evolution of the financial structure have been disregarded and have not had much attention in the literature. Moreover, both types of financial institutions suffer from inefficiencies, and neither a pure form of bank-based nor market-based financial system exists in the real world. Therefore, it is very hard to reach an agreement on the exact relationship between financial structure and economic growth or even find an adequate explanation regarding the existence of different financial structure across countries and hence conclude that one type of the financial structure is better than the other.

Allen (1993) argues that the preferred structure of the financial system is determined based on the structure of the real sector. This is evident in developing economies with traditional industries where technology is established and the optimal actions and policies taken by managers are widely accepted and agreed as is the case in the agriculture sector. Thus, the banking system is more likely to be an effective way of allocating financial resources rather than the stock market. On the opposite side, stock

markets will dominate in advanced economies where there is a continuous change in the technology and no consensus about the optimal decisions and policies should be adapted by managers. For example, markets are dominated by large corporations, technological innovations, R&D, and high tech industries.

Carlin and Mayer (2003) investigate the relationship between the structure of financial institutions, firms' characteristics and industrial growth using 27 industries in OECD countries during the period 1970-1995. Their results reveal a strong relationship between the financial system structure and the types of activities that different industries are involved in. In particular, there is a close tie between stock market development and skill-intensive industries such as R&D and high tech industries in advanced economies. While a positive correlation exists between banking system development and bank-dependent industries, fixed capital industries, in less developed countries at earlier stages of economic development.

Cull and Xu (2011) use firm level data from 89 countries with two different estimation approaches to examine the relationship between the financial structure and firm growth at different stages of economic development and to test the hypothesis that the financial structure affects firm growth differently, based on the country's stage of economic development. Results support the view of new structuralism (Lin, 2011, Lin et al., 2009, Taylor, 2004). In less developed countries, at the early stages of economic development, banking systems play an extremely beneficial role in boosting both physical and human capital and hence economic growth; whereas, stock markets are positively linked with economic growth at advanced stages of economic development.

The main principles of the new structural approach to economic development could be outlined in the following points (Lin, 2011):

- (i) The economy's industrial structure will evolve and change as a result of changing the structure of factor endowments at different stages of economic development.
- (ii) The path of economic development consists of a large number of phases through which a country evolves from low-income and undeveloped economy towards a high-income advanced economy in a dynamic process, rather than just a simple two dichotomous levels of economic development, namely, under-developed versus developed.

(iii) At each stage of the economic development, the resources allocation is done through both effective free-market mechanisms alongside an active role for the state to facilitate structural changes and offer the prerequisite conditions for upgrading from one stage to another at the hierarchy of economic development such as infrastructures, institutional factors, and regulations.

Whereas the key features of earlier Structuralism (Furtado, 1977, Gerschenkron, 1962, Hirshman, 1958, Justman and Teubal, 1991, Myrdal, 1957, Taylor, 1983) approach to economic development are:

- (i) Old structural economics divided the world based on a binary classification into two main categories: developing versus developed countries.
- (ii) The suggested development policies were import-substitution strategies which encourage developing countries to mimic the economic structure in developed countries and develop advanced capital intensive industries which is against the comparative advantage determined based on the country's factor endowment structure in these countries.
- (iii) To implement the suggested development policies, earlier structural economics advocated the government intervention in the economy. They pointed out that free market mechanisms involve a number of insurmountable deficiencies that stress the importance of state intervention in economic activities to speed up the pace of economic development through protectionism, fixed exchange rate, financial repression and state-owned corporations' policies.

Gerschenkron (1962) examines the evolution and development of financial structure at different stages of economic development during the European industrial revolution period. He identifies three different patterns: financial systems based on short-term banking lending, long-term lending and managerial assistance, and financial systems dominated by government intervention. Results highlight the importance of a country's specific factors in examining the relationship between financial structure and economic development. In addition, Goldsmith (1969) indicates that the financial system structure evolves and develops as the country develops and moves over the path of the economic development. Moreover, Mayer (1988) examined the importance of different channels through which investment is financed in a number of industrialized countries, namely UK, USA, France, Japan and Germany during the period 1970-1985. He points out that

the stock markets were relatively weak and unimportant during this period in these countries except USA.

Accordingly, the new structural economic approach (Lin, 2011) indicates that the structure of factor endowments at each stage of economic development determines the corresponding industrial structure of the economy based on the comparative advantage approach, which in turn determines the corresponding financial structure. Thus, certain types of financial institutions and arrangements are better than others in serving particular industries. In other words, financial structure is dynamic and determined endogenously by the demand from the real economy for specific types of financial services which change at different stages of economic development. In early stages of economic development the financial structure is more likely to be bank-based dominated by a large number of small banks that provide their financial services to a large number of small-size manufactures and entrepreneurs. Conversely, in advanced stages of economic development, the financial system is expected to be dominated by the stock markets. However, Calomiris (2011) argues that developing countries have a limited access to the financial services. This is because of financial systems in developing countries mainly consists of a small number of relatively large banks which have been established by a coalition of government and the elite of business interest to provide financial services to affiliated corporations.

According to the consensus view (See for example, Allen et al., 2006, Chandler, 1977, Gerschenkron, 1962, Lin, 2011, Lin et al., 2009, Rajan and Zingales, 1998a, Rajan and Zingales, 1998b, Tilly, 1967), the development of financial institutions and structure is not only affected by legal factors and political considerations, but also by factor endowments, the structure of the real economy, and the stage of economic development.

Recently, some studies, which have focused on the importance of bank-based financial systems relative to market based financial system in supporting economic growth, argue that the level of economic development might be a key determinant for financial structure. Developing countries are more likely to have a bank-based financial system in the early stage of economic development, where legal institutions are weak, the financial system is less developed and a large number of small firms rely heavily on finance provided by banks. In contrast, developed countries are more likely to have a market based financial system. Where the efficiency of legal institutions capabilities

strengthen in enforcing legal rights, financial system is developed and firms are owned by a large number of shareholders (Lee, 2012).

Levine mentions that “bank-based systems are better at mobilizing savings, identifying good investments, and exerting sound corporate control, particularly during the early stages of economic development and in weak institutional environments” (Levine, 2002, P. 1). Furthermore, Boyd and Smith (1998) argue that banks are of paramount importance at low levels of economic development. However, as capital accumulates and income rises, the economy moves along the economic development path and the country’s financial system becomes more market based. Moreover, Rajan and Zingales (1998a) and Gerschenkron (1962) indicate that banking systems play a crucial role in terms of financing industrial expansion and promoting economic growth more effectively than market-based systems in developing countries, where legal framework, shareholders protection codes, and property rights are weak. In the early stages of economic development banks provide external resources to new firms and innovative entrepreneurs which require long-term commitments (Stulz, 2000). In addition, it encourage firms to reveal all types of information needed and pays back their debts (Rajan and Zingales, 1998b). However, overtime the importance of banks relative to stock market decreases, and thus developed countries gain a lot of advantages from market-based financial systems as a result of developed legal systems which enforce shareholders protection and property rights codes (Demirgüç-Kunt and Levine, 2004).

Allen et al. (2006) investigate the relationship and the causality direction between the financial structure and the structure of the real sector within the economy using a panel data set for 93 countries during the period 1976-2004 alongside pooled FGLS and panel EC2SLS approaches. They test whether the development and evolution of the real sector influence the country’s financial structure. Results show a positive correlation between financial structure and real structure where the financial structure evolves and develops in response to the demand for financial services by industries and that the composition of the real economy is a key determinant for economy’s financial structure. When the structure of the real economy is mainly dominated by physical-assets-intensive industries, the financial system tends to be dominated by bank-based financial systems. However, if the economy is ruled by knowledge, research and intangible-assets-intensive industries, the stock market is more likely to emerge and rule the

financial system. Moreover, in terms of the direction of causality, they argue that economic structure granger causes the financial structure.

Demirguc-Kunt et al. (2011) use quantile and OLS panel regressions together with data for 72 countries during the period 1980-2008 to examine the dynamic relationship between financial structure and economic development from different angles. Firstly, they investigate whether the sensitivity of economic development to a change in banking development and/or securities market development variables vary through the process of economic development as countries grow and develop. Secondly, they assess the association between the financial structure gap and the level of economic development. The financial structure is estimated as the ratio of banking sector development, measured by the private credit as a share of GDP relative to securities market development, measured by the securities market capitalisation as a share of GDP. Higher financial structure ratio indicates a more bank-based financial system.

Moreover, a measure of an optimal financial structure that is associated with each level of economic development has been constructed based on OECD as benchmark counties while controlling for the legal origins, national, institutional, geographical, and structural characteristic of these countries. Afterwards, the optimal financial structure for each country is estimated based on the coefficients from the benchmark model. Hence, the financial structure gap is computed as the natural logarithm of the absolute value to the variance between the actual and the optimal financial structure for each country on a yearly basis.

Results indicate that, financial structure matters for the economic development, that is, both types of financial institutions, banks and securities market, grow and developed as the country moves towards higher stages of economic development. However, the sensitivity of the economic development measured by the logarithm of real GDP per capita to the banking sector development declines compared with securities market development. In addition, the deviation from country's optimal financial structure is extremely destructive for the economic activities and lowers the level of economic output.

However, these results are subject to criticism. First, if the financial structure is determined endogenously then the estimated financial structure coefficients will be biased and as a result hypothesis could not be tested. Second, there is a lot of debate and

doubt about using the OECD countries as a benchmark model to estimate the optimal financial structure. On the one hand, assuming that the financial structure at the OECD countries is optimal is far from reality as we have seen from the financial crises in 2009 which indicates that the financial system in these countries are fragile and need more regulations. On the other hand, this assumption implicitly argues that the financial system structure at different countries should follow the same path of evolution and development that happens at the OECD countries “one size fits all strategy”. However, for example the financial structure in developing countries is more likely to be totally different from that in the developed countries as they are at different stages of economic development. Adapting this view is more likely to lead to destructive and undesirable consequences, such as financial crises. Moreover, Lin (2011) points out that advanced economies, UK and USA, at the early stages of economic development were mainly dominated by a large banking sector. As they grow and become richer and more developed, the financial system turns out to be market-based. Hence, the structure of the financial system at developing countries should be consistent with its factor endowments, comparative advantages, and the structure of real sector and industries.

Lee (2012) re-examines the relative advantages of the bank-based versus market-based financial system in stimulating the long-run economic growth, using time series analysis and Granger Causality test for six countries. Results indicate that time series techniques are more powerful than cross section techniques which partially capture the dynamic relationship between variables. In other words, cross section empirical studies have failed to investigate the causality and the relationship between the financial structure and economic growth since cross sections studies are based on the assumption of stable relationship. However, the relationship between financial structure and economic development may change and evolve over time and the path of economic development.

Ergungor (2003) investigates the relationship between the financial structure and economic development using data for 46 countries during the period 1980-1995, using both OLS and IV methods. After controlling for the overall level of financial development, results show that a non-linear co-integration relationship exists between the financial structure and economic growth. Furthermore, in civil-law countries where inflexible judicial systems exist, banks play a very important role in enforcing contracts inside the economy. “In other words, the positive influence of the markets on growth disappears in these economies because banks assume additional roles to compensate for

the inflexibility of the judicial system"(Ergungor, 2003, p. 2). In contrast, flexible judicial systems and common-law countries are more likely to have market-based financial systems.

To sum up, a country's financial structure will be changing over time, since it is influenced by the demand for financial services from the real sector which evolves and develops over the path of economic development as more capital accumulation and resources take place. In other words, different structures of the real sector and industries have different firms and projects with various types of risk, size, and financial needs. Therefore, dynamic change at the real sector at different stages of economic development creates the demand for different types of financial instruments, contracts and institutions. Consequently, particular types of financial system structure will exist and be more effective than others in managing particular types of risk, matching savings with investment, promoting resources allocation efficiency, and spurring economic growth at a particular point of time and stages of economic development.

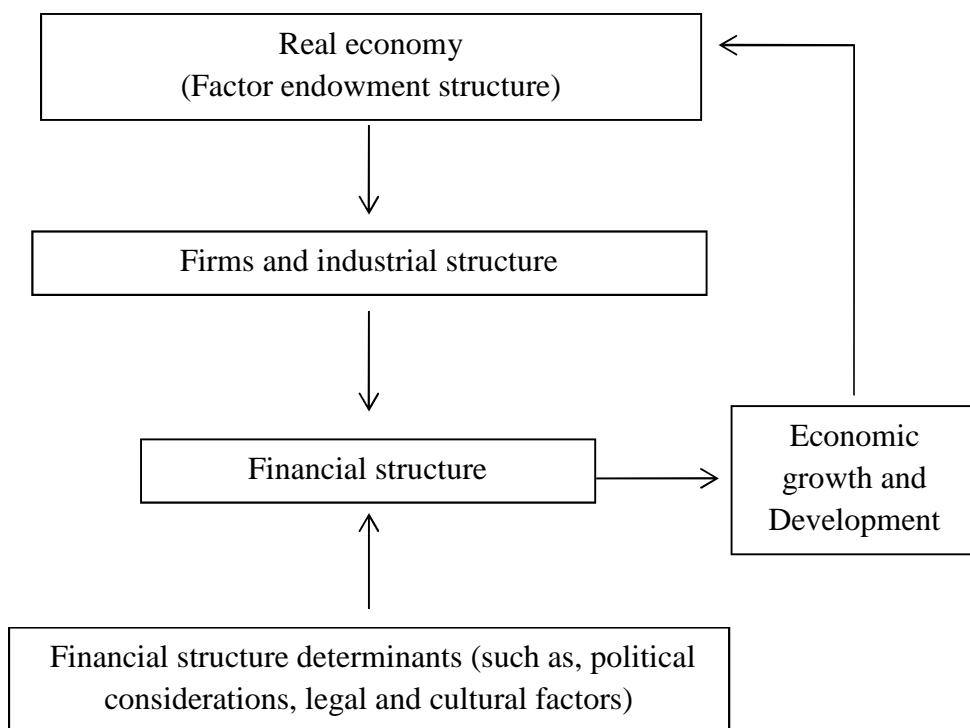
Allen and Santomero (2001) articulate that different financial structure accommodates different types of risk. In a bank-based financial system competition between financial institutions will be less severe compared with market-based system and as a result financial intermediaries will be well-functioning and able to manage risk through intertemporally smoothing and building up liquid reserves. Conversely, in market-based financial systems where financial markets are more developed and well-functioning, financial intermediaries cannot ease and diversify risk through intertemporally smoothing due to acute competition from other financial markets, As a result, banks will be obliged to adapt cross-sectional risk sharing in order to manage and accommodate risk such as investing in derivatives.

Hence, at the early stages of economic development, a bank-based financial system has more advantages and efficiency than a market-based financial system. In developing economies capital is scarce compared with abundant unskilled labour force and the real sector tends to be mainly dominated by mature labour-intensive industries. These industries mainly constitute of a large number of small-size firms that require a small

amount of external capital as they rely on individual fortunes and retained earnings to some extent and involve high degree of entrepreneurship risk.¹²

When it comes to advanced economies at higher stages of economic development, capital resources turn out to be relatively abundant compared with labour. The structure of the real sector is more likely to be dominated by capital-intensive industries such as large firms, R&D projects, innovation projects and high-tech investments. These corporations rely heavily on external finance and exposure high technological and product innovation risk. As a result the structure of financial system at these stages is dominated by financial markets which are consider as the main source to raise capital needs and offer a high degree of risk diversification. In other words, as the economic development takes place, the economy will enjoy better supervision, well-functioning legal framework and informational institutions which considered as prerequisites for financial market development (Kwok and Solomon, 2006).

Figure 4.1. New structuralism view



Source: Author's

¹² The risk of firm can be divided into three categories based on the risk source. First, technological innovation risk that depends on the technological features of the industry: whether its new or mature industry. Secondly, product innovation risk is connected with the novelty of the product, firm's strategy and market conditions. Finally, entrepreneurship risk indicates the risk concerning manager's strategy and ability to manage and operate the firm. For further discussion see (Lin, Sun, and Jiang, 2009).

4.3 Concluding Remarks

A vast body of literature that examined the role of financial structure in advancing economic growth rates, particularly the relative merits of banking system versus financial markets, did not reach an agreement. This is due to the fact that the determinants of the financial structure, political conditions, law and legal origins, cultural factors, and the association between the structure of the real economy and the evolution of financial system structure have been disregarded and have not had much attention in the literature. Moreover, both types of financial institutions suffer from inefficiencies, and neither a pure form of a bank-based nor market-based financial system exists in the real world. Therefore, it is very hard to reach an agreement or adequate explanation regarding the existence of a different financial structure across countries and to conclude that one type of the financial structure is better than the other. In contrast, a large number of empirical studies argue that the structure of the financial system is irrelevant and doesn't matter for economic growth. Indeed, what matters for the economic growth is the overall level of financial development.

Other studies highlight the importance of legal factors as a key determinant of the financial structure. They state that advanced countries with a well-functioning legal system and high standard financial statements tend to have a more market-based financial system. But, developing countries with a fragile legal framework and accounting system are more likely to be dominated by a bank-based financial system. Thus, the law and finance approach considers finance as a set of contracts that are defined by the legal rights and quality of legal enforcement. In this sense the corporate law and legal factors play an important role in the development of financial system.

Another strand of the literature emphasises the new structural approach. The structure of factor endowments at each stage of economic development determines the corresponding industrial structure of the economy, based on the comparative advantage approach, which in turn determines the corresponding financial structure. Thus, certain types of financial institutions and arrangements are better than others in serving particular industries. In other words, the financial structure is dynamic and determined endogenously by the demand from the real economy for specific types of financial services which change in response to different stages of economic development inside the economy.

Thus, a country's financial structure will be changing over time, since it is influenced by the demand for financial services from the real sector which evolves and develops over the path of economic development as more capital accumulation and resources take place. In other words, different structures of the real sector and industries have different firms and projects with various types of risk, size, and financial needs. Therefore, dynamic change at the real sector at different stages of economic development creates the demand for different types of financial instruments, contracts and institutions. Consequently, particular types of financial system structure will exist and be more effective than others in managing particular types of risk, matching savings with investment, promoting resources allocation efficiency, and spurring economic growth at a particular point of time and stages of economic development.

Hence, at the early stages of economic development, a bank-based financial system has more advantages and efficiency than a market-based one. In developing economies capital is scarce compared with abundant unskilled labour force, and the real sector tends to be mainly dominated by mature labour-intensive industries. These industries mainly constitute of a large number of small-size firms that require a small amount of external capital as they rely on individual fortunes and retained earnings to some extent and involve high degree of entrepreneurship risk.

As regards advanced economics at higher stages of economic development, capital resources turn out to be relatively abundant compared with labour. The structure of the real sector is more likely to be dominated by capital-intensive industries like large firms, R-D projects, innovation projects and high-tech investments. These corporations rely heavily on external finance and exposure high technological and product innovation risk. As a result the structure of financial system at these stages is dominated by financial markets which are consider as the main source to raise capital needs and offer a high degree of risk diversification. In other words, as the economic development takes place, the economy will enjoy a better supervision, well-functioning legal framework and informational institutions that are consider as prerequisites for the financial market development (Kwok and Solomon, 2006).

5 The Financial sector reforms in Egypt: An overview

5.1 Introduction

This chapter provides an empirical narrative about the evolution and impact of financial reform programme implemented in Egypt. It does so to set the latter work in context. It assesses analytically the evolution and the nature of the financial development in Egypt under different financial programmes. In particular, this chapter investigates the motivations for financial reform and the development of the Egyptian financial sector under both the financial repression system and the financial liberalisation programme.

Policy-makers, successive governments and the central bank adopted various reform programmes in the Egyptian economy over the last three decades in a bid to accelerate the process of economic development and stimulate economic growth. In light of the importance and the fundamental role that finance plays in terms of promoting and enhancing the economic growth rate, at the core of these programmes were the financial policies aiming at financial markets development in conjunction with stimulating the capital inflows into the Egyptian economy.

The economic policies that were followed during 1970s and 1980s resulted in massive price distortions and a great deal of market imperfections within the Egyptian economy such as high inflation rates, exchange rate distortions and balance of payments problems (Arestis, 2003, Bolbol et al., 2005, Ikram, 2009, Roll, 2010). As a result, the Egyptian government implemented alternative economic policies that aimed at removing macroeconomics imbalances as a prerequisite to receive financial aid and assistance from both the World Bank (WB) and International Monetary Fund (IMF). At the outset of the 1990s, the financial liberalization programme was initiated in Egypt as part of the Economic Reform and Structural Adjustment Programme (ERSAP) based on the prescriptions provided by the IMF and WB. This programme aimed at transforming the state-dominated economy to a market-oriented economy in which the private sector plays the leading role and key mechanism for achieving higher resources allocation efficiency and promoting economic growth.

One central dimension of this wide-range programme was the financial sector reform based on extensive financial liberalisation policies. Since the beginning of the 1990s, Egypt has implemented a comprehensive financial reform programme to liberalise the state-controlled economy, eliminate market segmentation and switch over to the free market mechanism through liberalizing the interest rates, cutting reserve requirements, abolishing directed lending programs, privatizing the state-owned banks, eliminating restrictions on the banking sector entry, developing the stock markets, boosting competition in the financial markets, and liberalizing the capital account. These policies were particularly intended to inspire the financial system efficiency through liberalising the interest rate and efficiently managing credit and monetary policies. However, the financial reform programme, policies and sequences as such benefited merely the entrepreneurial elite connected to the political regime (Roll, 2010).

The rest of the chapter is organised as follows: Section 5.2 reviews the motivations that call the need for financial reform programs. Section 5.3 discusses the development of Egyptian macroeconomic performance, while Section 5.4 analyses the effect of financial liberalisation policies on the progress of the financial sectors, particularly banks and stock markets. Section 5.5 concludes.

5.2 The Need for Financial Sector Reform

The term financial repression programme refers to “a set of policies, laws, formal regulations, and informal controls, imposed by governments on the financial sector, that distort financial prices—interest rates and foreign exchange rates—and inhibit the operation of financial intermediaries at their full potential” (Denizer et al., 1998, P. 3). These financial policies sought to reinforce a government’s development strategy through low interest rates and the direction of credit to a preferential public sector and projects. Giovannini and Melo (1993) declare that financial repression policies served as a taxation device aiming at financing government needs by channelling domestic capital resources at artificial low interest rate to the government. On the contrary, proponents of financial repression, such as Stiglitz (1989, 1994a), argue that financial repression policies and government intervention in developing countries could correct the financial market

imperfections and channel capital resources to those projects with highest technological spill overs and social returns.

The pre-reform period (1960-1990) was a period of financial repression during which the Egyptian financial sector was extremely repressed through significant degrees of government intervention in the market. The financial sector was constrained by various measures of financial repression policies including administrative controls over deposit and lending rates, allocation of capital resources through directed credit to preferential public and less-productive sectors, state banks ownership, high reserve requirements and credit ceilings on commercial banks, severe restrictions on capital flows and an uncompetitive and segmented financial sector. These financial repression policies accompanied by a high budget deficit that led to a limited monetary growth, high inflation rate, suppressed savings, and a limited access of the private sector to financial resources. The budget deficit ratio increased from 18.3% in 1981 to 23% in 1986 and then decreased to 15% in 1991. Furthermore, the inflation rate accelerated from 1.1% to 14.1% during the same period. In the meantime, the private saving ratio and the private credit ratio declined from 32% and 24% in 1981 to 28% and 22% in 1991 respectively. As a result, the level of investment and economic growth rate plunge due to inefficiency in the capital resources allocation, where investment was mostly undertaken by an inefficient public sector, and a less credit was directed to the private sector (Arestis, 2003, Bolbol et al., 2005, Ikram, 2009, Roll, 2010).

At the beginning of the 1960s, the financial sector contracted in terms of the number of banks as a result of a broad nationalization process for private banks and the expansion of the public sector development, where several banks had been nationalised and the banking sector was condensed to only four public banks (National Bank of Egypt, Banque de Caire, Bank Misr and Bank of Alexandria). The supervision of the financial sector was awarded to the Central Bank of Egypt (CBE) as an administrative entity that is fully controlled by the government. Moreover, in the wake of the nationalisation process, the insurance sector dwindled into three main corporations that are owned by the public sector. At that time the main obligation of the financial system was to provide and channel the financial resources to the public sector development. Hence, the dominance of the state-owned banks and the directed capital resources to the public sector were the main reasons behind the collapse of

private investment due to inefficiency in the allocation of capital resources and minimizing the loanable fund available to the private sector.

During the 1970s and 1980s the primary task of the Egyptian financial sector was to finance the public deficit, public sector investment and government needs. In the early 1970s, the Egyptian government implemented the economic open door policy, in which the public sector plays a major role along with the private sector in the economy through market mechanisms. Several joint venture banks were established and owned by both public and foreign banks, in which the share of the public banks had to be more than 51%. However, the spread of public banks' branches and networks permitted them to dominate the financial sector, and as a result, the financial intermediation services and allocation of capital resources provided by those banks were inefficient. As a result, their balance sheets were exhausted by the non-performing loans (Henry, 1996). Since then, the World Bank (WB) and International Monetary Fund (IMF) have continued to encourage the Egyptian government to implement the market-oriented economy through various legislations that encourage the private sector and boost both domestic and foreign entrepreneurs' incentives.

5.3 A Review of Egypt's Macroeconomic Performance

This section analyses the macroeconomic performance of Egypt over the period 1980-2011. This period under scrutiny can be divided according to the macroeconomic policies adopted by the Egyptian government into two phases: the open-door policy during the 1980s and the Economic Reform and Structural Adjustment Program (ERSAP) through the 1990s and 2000s.

The Egyptian macroeconomic performance was extremely influenced by a massive government intervention in the economy during the 1980s that negatively affected the macroeconomic performance. In the years 1982-1983, the government implemented severe restrictive policies, including a high reserve ratio that aimed at shrinking the volume and the growth rate of both the domestic credit and money supply within the economy. These policies resulted in a reduction in the private credit ratio from 28% to 22% during the period 1983-1991. Consequently, the private investment as a share of the GDP dropped from 12% to 9% during the same period and to less than 35% of the total investment in

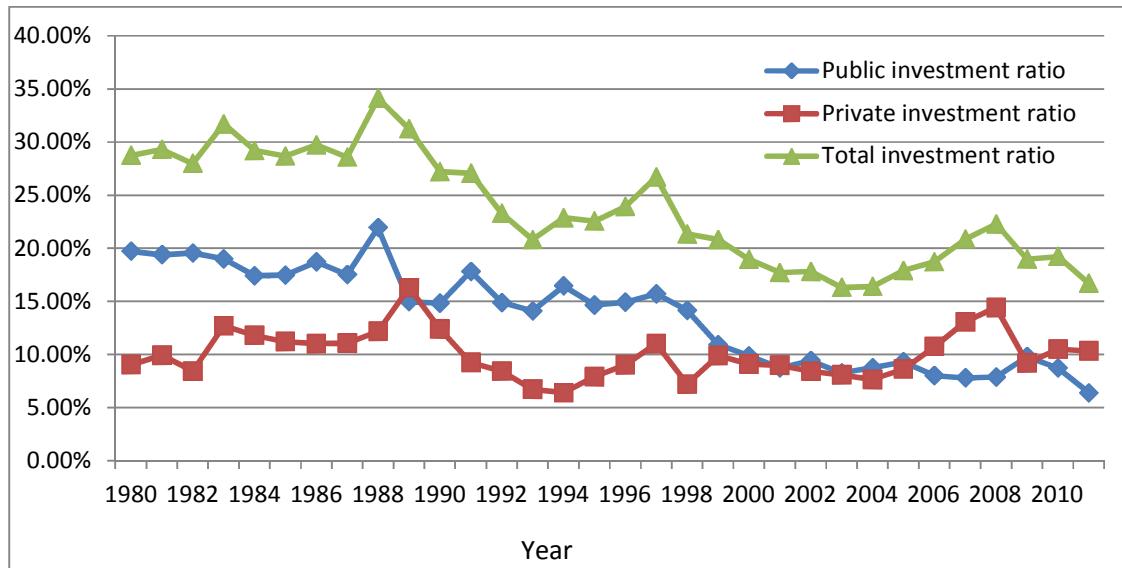
1991. Moreover, the economic growth rate deteriorated and declined from 10% in 1982 to 1% in 1991. This, also, coupled with a high inflation rate and widening budget deficit ratio of 14.5% and 15% respectively (see Figure 5.3).

At that time, the Egyptian economy suffered from different types of market inefficiencies and serious structural imbalances such as a high budget deficit, severe current account deficit and savings-investment gap, which was exaggerated through various measures of financial repression like the administrative prices, interest rate ceilings and a subsidized credit to the public sector along with a restriction on the private credit. Therefore, the macroeconomic policies aimed at stabilising the economy and promoting the economic growth rate by curbing the inflation rate, current accounts, and budget deficits.

Subsequently, Egypt adopted a unified and floated exchange rate regime by the end of 1991. Furthermore, all transactions, including both physical and capital foreign transactions for abroad in the capital account, were substantially liberalised. Additionally, the monetary authority established weekly auctions for Treasury Bills in order to finance their budget deficit, to reduce inflation pressures and to initiate a free market process for the interest rate determination.¹³ Hence, during the first two years of the financial liberalisation programme, the Egyptian Central Bank sold Treasury bills of LE 500 million that rose to LE 38 billion in 1998, in addition to LE 84,654 million Treasury Bond (Central Bank of Egypt, 1998/1999). However, these policies resulted in plunging private savings, private investment, and growth rate.¹⁴ An apparent feature from the investment pattern in Egypt during the period under scrutiny was the relatively constant ratio of the private investment to GDP over the period which fluctuated around 10%. On the other hand, the public investment as a share of GDP continuously declined from 19.7% in 1980 to 6.3% in 2011. Another striking feature was the fall of the total investment of the GDP ratio from 28.7% in 1980 to 16.7% in 2011 (see Figure 5.1 below).

¹³ In other words, using private savings to finance the budget deficit rather than increasing the money supply through printing money.

¹⁴ Since gross domestic savings include both private and public savings, the private saving is measured as gross domestic savings minus public savings (budget deficit). In addition, the private investment is defined as the total expenditures on additions to fixed domestic assets by the private sector.

Figure 5.1. Public, Private and Total Investment Shares of the GDP

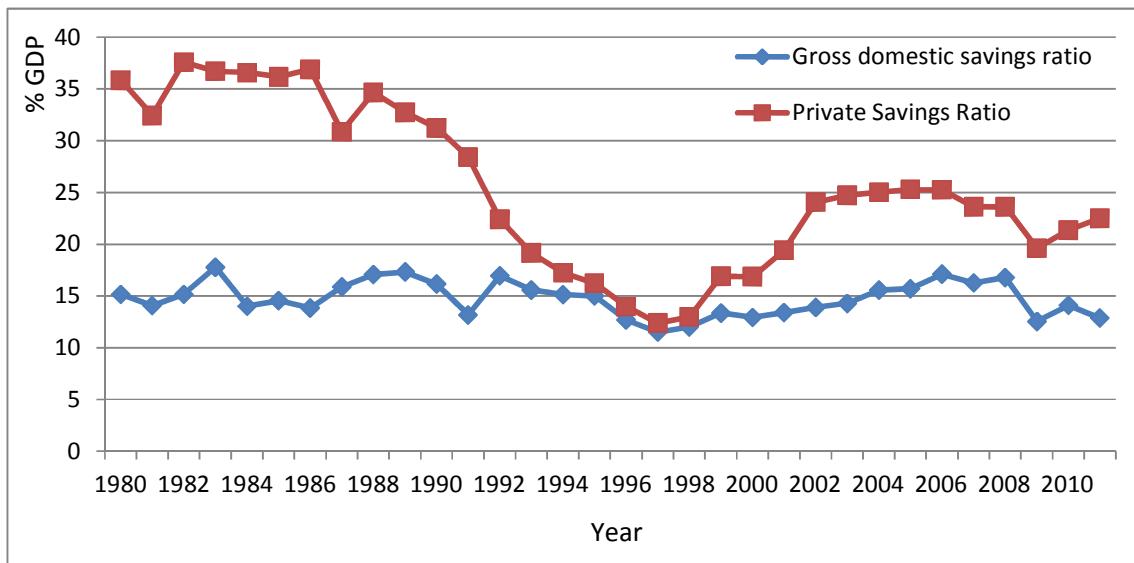
Source: Ministry of Planning, Egypt (2013).

Despite this, the share of the private investment to the total investment escalated from 45% in 1991 to 62% in 2011 due to the implementation of the Economic Reform and Structural Adjustment Program (ERSAP) in 1991. In contrast, the public investment to total investment ratio plummeted from 55% in 1991 to 52% in 2000 and finally to 38% in 2011. In the meantime, the private credit ratio rose from 22% in 1991 to its highest value of 55% in 2001. This indicates that the credit provided by the banking system to the private sector during the financial liberalisation period was not transformed into real investment. This confirms the view that the financial liberalisation policy applied in Egypt constrained the available funds for the business sector through a private credit misallocation in favour of households rather than loans to firms and businesses, and this resulted in a lower capital accumulation and investment to the GDP ratio.

Figure 5.2 indicates that the private savings as a share of the GDP continuously decreased from the late 1980s and 1990s to its lowest value at 12% in 1997. However, it increased afterwards to 23% in 2011 as a consequence of various measures of privatisation and revision of the financial sector regulations during 1993-1994, which aimed at strengthening the financial market competition and spread new branches in the Egyptian economy. Similarly, the public dissaving ratio (budget deficit ratio) decreased from 20% in 1980 to

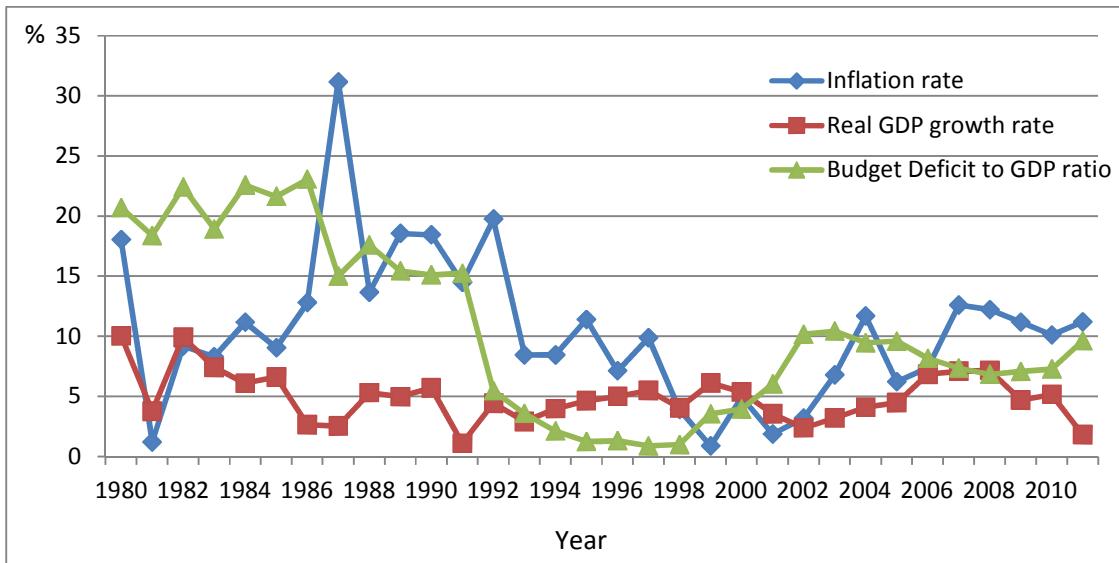
0.8% in 1997 in line with the IMF and World Bank conditions; however, it accelerated subsequently to 10% in 2011. Consequently, the gross domestic savings ratio remained relatively constant at around 15% during the period 1980-2011.

Figure 5.2. The Ratio of Domestic and Private Saving



Source: Author calculations and World Bank (2013).

These financial liberalisation procedures appeared to be associated with a lower economic growth rate during the last two decades on averages of 4.3% and 4.9% respectively, compared with 6% during the 1980s. Additionally, it is worth noting that the economic growth rate fell markedly in the late 1980s and early 1990s due to the global recession and collapse of oil prices that led to drop in oil returns, Suez Canal revenues and remittances coupled with high inflation rate and budget deficit ratio. Similarly, the economic growth rate dropped in the late 1990s as a result of the Luxor attack in 1997, oil prices collapse in 1998, and the world downturn in 1997 due to the Asian financial crisis. Nevertheless, the inflation rate and budget deficit ratio improved at the initial phase of the liberalisation programme and declined to 0.8% in 1999 and to 0.9% in 1998 respectively. They escalate afterwards to 11.2% and 9.6% in 2011 respectively (see Figure 5.3).

Figure 5.3. Inflation Rate, Real GDP Growth and Budget Deficit Ratio

Source: World Bank (2013).

5.4 A Review of Egypt's Financial Sector Development

The Egyptian financial system can be divided into two fundamental sectors: banks and stock market. Furthermore, the process of the financial liberalisation can be split into two periods. The first phase of the financial reform (1991-2003) involved what were commonly known as the orthodox IMF and WB prescriptions including channelling financial resources to the private sector and liberalising all domestic prices, including interest rates. So, they can be determined through the market force as a basic mechanism for capital resources allocation process. In 1991, both deposit and lending interest rates were liberalised, whereas credit ceilings for the private sector were abolished in October 1992 and for the public sector in July 1993 (for timing and sequences of financial liberalisation procedures implemented in Egypt during the financial reform programme see Table 5.1).

The second phase of the programme (2003-2011) comprised restructuring the financial sector and boosting competition through the privatisation programme and reinforcing the monitoring and supervising process over the financial system. In July 2003, the banking sector was restructured to permit foreign banks intervention, the introduction of the international financial standards, and an extensive privatisation programme based on the assumption that all joint venture banks owned by the state had to be privatised. In addition,

more authority was provided to the Central Bank of Egypt (CBE) in monitoring, supervising and regulating the financial markets by law no.88 of 2003 according to which the central bank governor reports directly to the president.

Table 5.1. Financial Liberalization Program in Egypt; Dates and Sequences

Financial liberalisation Measure	Date	Descriptive
Interest Rates Liberalisation	1991	In January 1991 nominal interest rates were liberalised (both deposit and lending rates)
Reserve Requirements Abolition	1991	In December 1990 the reserve requirement ratio held by banks at the CBE were reduced from 25 % prior to the financial reform to 15 % of total Egyptian pound and foreign deposits. Moreover in December 1993, the reserve requirement ratio of foreign deposits held by banks at the CBE was reduced to 10 %.
Credit Controls Elimination (credit ceilings and directed credit program)	1993	Credit ceilings were abolished for the private sector in October 1992 and for the public sector in July 1993.
Banks Privatization and Restructuring	1998	In June 1998 banks regulations and laws were revised to allow for private and foreign ownerships. As a result several state-owned and joint venture banks were privatised. In July 2003, the banking sector has been restructured through extensively privatising all the joint venture banks owned by the state and more authority has been provided to the Central Bank of Egypt (CBE) in monitoring, supervising and regulating the financial market.
Strengthening of Prudential Regulations (i.e. central bank independence)	1991	Progressive prudential regulations and laws have been applied by the end of 1991 and early 1992 regarding liquidity ratio, capital adequacy ratio, the solvency criterion (Basle Accord), along with law No. 37 of 1992 which strengthen the supervision and control of CBE as a surveillance financial authority. Additionally in 1997, banks adopt the International Accounting Standards (IAS) in their accounts and publish their financial statements.

		The central bank autonomy process reached its peak by law no.88 of 2003 by which the central bank governor report directly to the president.
Stock Market Development	1992	<p>Official date of stock market liberalisation defined by the date, at which the Capital Market Law (Law 95/1992) was enacted aim at initiating the Capital Market Authority (CMA), regulates trading and issuance of securities, alleviates all restrictions on capital market activities and grants foreign investors full access and the opportunity to invest in the domestic capital market.</p> <p>Moreover, in 2000, the Central Depository Law No.93 established Misr Clearing, Settlement and Central Depository Company (MCSD).</p>
Capital Account Liberalisation	1991	Egypt adopted a unified and floated exchange rate regime by the end of 1991. Furthermore, all transactions, included both physical and capital foreign transactions in the capital account, were substantially liberalised.
Pro-Competition Policies	1993	Various regulations were passed to strength the financial market competition through removing entry barriers for domestic and foreign banks, where foreign banks were permitted to involve in the domestic financial activities and ownership through establishing new branches in the Egyptian economy.

Sources: *Central Bank of Egypt (CBE) various reports, International Monetary Fund (IMF) Egyptian reports and Annual Report on Exchange Arrangements and Exchange Restrictions, Achy (2005), Arestis (2003), and Ikram (2009)*.

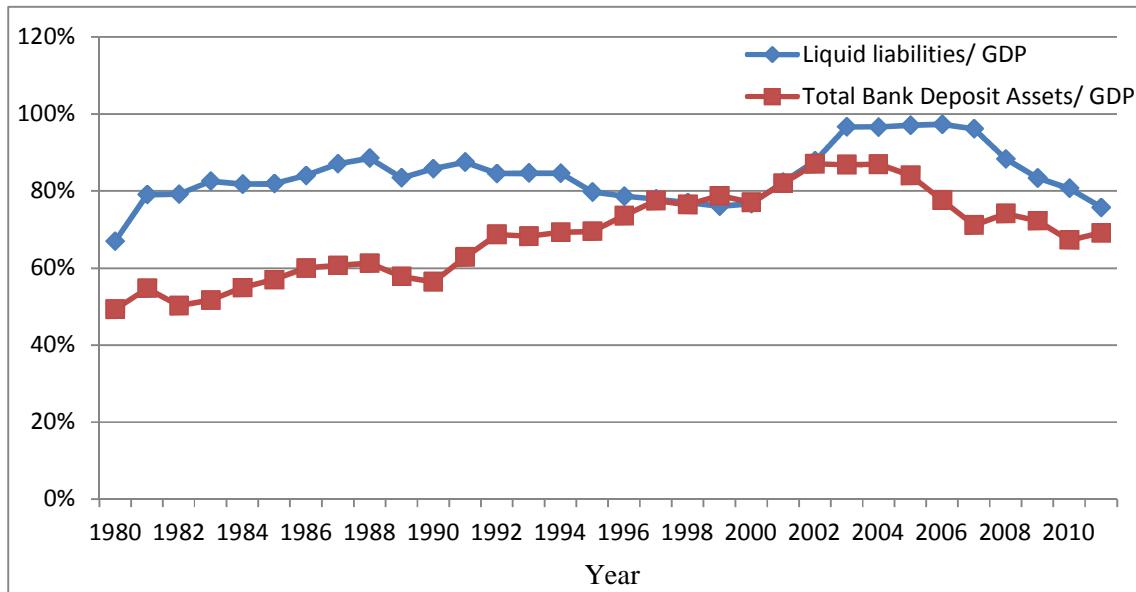
5.4.1 The Banking Sector Development

The changes concerning the financial system management took place at the beginning of the 1990s, when the Egyptian government implemented the orthodox reform package, the Economic Reform and Structural Adjustment Program (ERSAP) proposed by the International Monetary Fund and World Bank. It aimed at stabilising the economy through attaining a macroeconomic balance and reducing inflation via structural adjustments to boost the economic growth rate at the medium and long-run. In particular, economic policies aimed at eliminating economic distortions and market inefficiencies through reducing government intervention in the economy and reforming the public sector via the

privatisation process. It also sought to liberalise foreign trade and all domestic prices, including interest rates to be determined through the market force as a basic mechanism for the resources allocation process in order to boost competition and the allocation efficiency of economic resources.

Figure 5.4 depicts the development of the financial system indicators as shares of GDP. According to the graph, the liquid liabilities ratio measured as broad money (M_2) relative to GDP, gradually increased during the pre-reform period (1980-1989) from 67% to 89% respectively and led to a higher inflation rate. Thus, with the implementation of the financial liberalisation programme and in order for the monetary authority to be able to curb the inflation rate and meet their target, the liquidity ratio was constrained and gradually declined from 88% as a share of GDP in 1991 to 76% in 1999. Nevertheless, it increased afterwards and reached the peak point at 97% during the period 2003-2007, which reflects an increasing role for the banking sector in the intermediation process.

An alternative measure of financial depth extensively used in the literature was the ratio of the total bank deposit assets to GDP which captured the relative importance and the size of the banking sector relative to the economic activities. As can be seen from Figure 5.4, the ratio of bank deposit assets steadily increased from 49% in 1980 to reach the highest point at 87% in 2002 and remained constant till 2004 before declining afterwards to 69% in 2011. So therefore, these indicators reflect a deeper financial system and an increasing role for banks within the economy.

Figure 5.4. Financial Depth Indicators

Source: International Financial Statistics (2013).

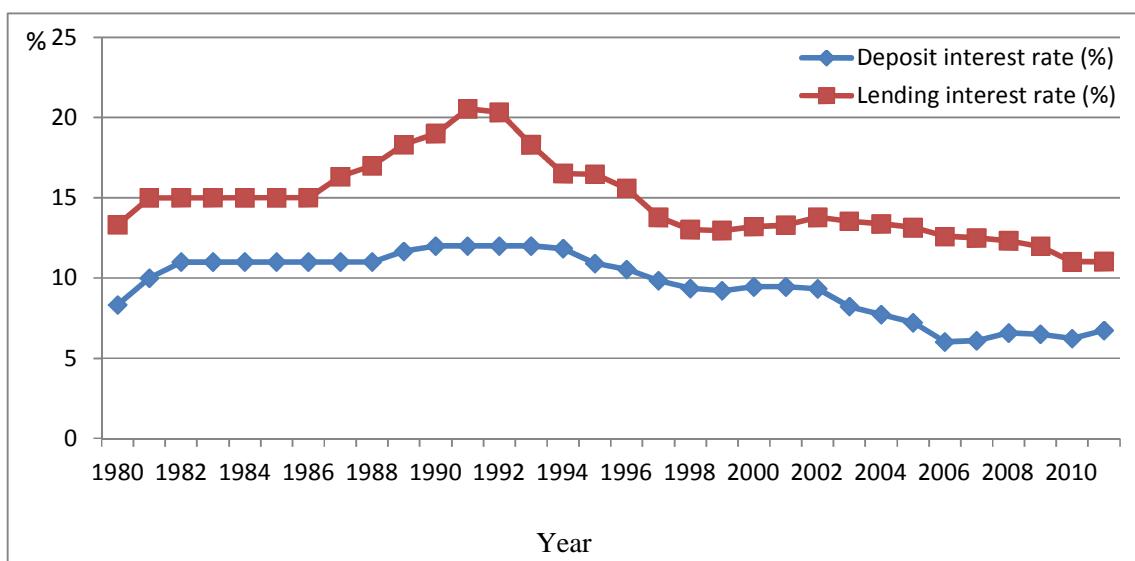
Besides financial liberalisation policies, the financial reform programme comprised comprehensive prudential regulations that aimed at enhancing the efficiency of financial services, the allocation of capital resources and the regulatory framework. Progressive prudential regulations and laws were applied by the end of 1991 and early 1992 regarding the liquidity ratio, capital adequacy ratio, auditing, assets classification, the solvency criterion (Basle Accord), along with law No. 37 of 1992 which strengthened the supervision and control of CBE as a surveillance financial authority.

Moreover, the regulation and supervision framework operated by the Central Bank of Egypt (CBE) was reinforced to ensure that the market was operating properly and efficiently without any deficiencies. Meanwhile, on the one hand, a tight monetary policy was put in place to control the inflation rate by adjusting monetary growth and on the other hand mobilise domestic savings and other financial resources. As a result, the liquidity growth rate decreased from 28.7% to 5.6% during the period 1991-1999. However, the inflation rates targeted were met and the inflation rate dropped significantly from 18.4% in 1991 to 0.8% in 1999; domestic savings as a percentage of GDP declined from 16.1% to 13.3% during the same period.

In particular, financial liberalisation policies aimed at restructuring the banking sector and the overall financial system through liberalising interest rates to be determined through the market forces, removing all constraints on credit to the private sector and cut the public ownership through a privatisation programme in order to boost the free market mechanism.

During the period of the financial repression in the 1980s, interest rate ceilings on bank loans and deposits were imposed by the monetary authority, and the nominal lending and deposit rates stood at 15.5% and 10.7% respectively. However, as a result of the financial liberalisation programme that started in 1991, interest rates were liberalised and allowed to be determined through the market forces. Hence, the nominal deposit and lending rates increased gradually from 11.6% and 18.3% by the end of 1989 to 12% and 20.5% in 1991 respectively and then steadily declined afterwards to the lowest percentages of 6.2% and 11% in 2010 (see Figure 5.5). These procedures allowed a real interest rate, measured as a deposit interest rate minus an inflation rate, to be positive which encourage the savings mobilisation process.

Figure 5.5. Deposit and Lending Rates in Egypt

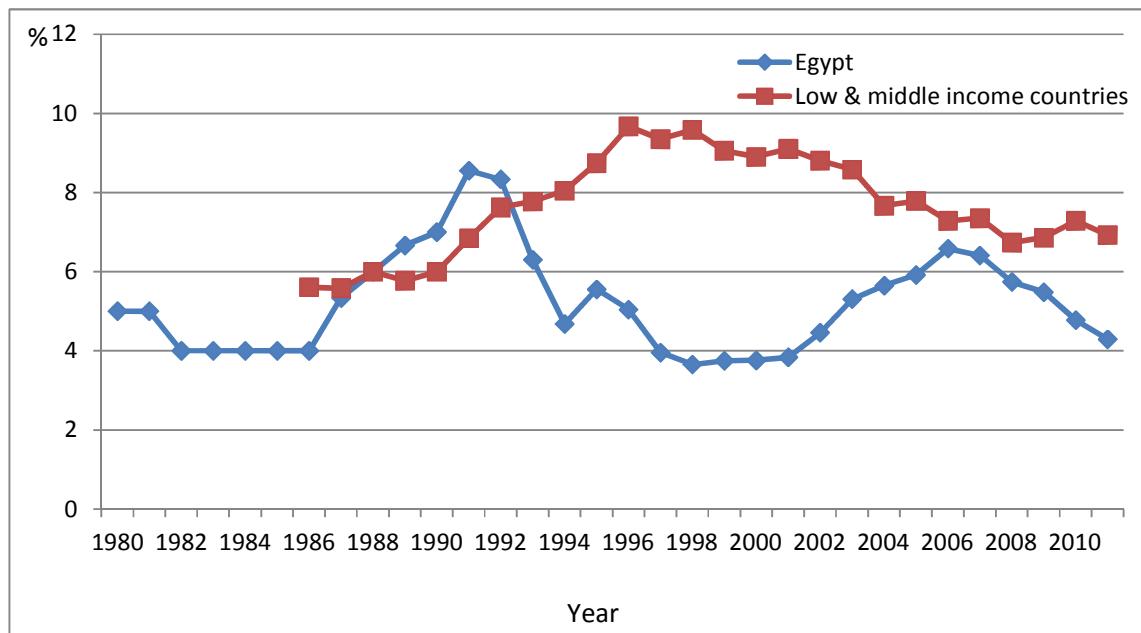


Source: World Bank (2013).

Furthermore, the spread between interest rates on loan and deposits widened at the beginning of the financial reform programme and reached peak at 8.3% in 1992 compared to 4.8% during the 1980s. In general, a high spread margin between deposit and lending

rates discouraged investments and on the other hand spurred moral hazards and speculative activities which in turn led to financial fragility and financial crises. Consequently, the monetary authority gradually and carefully implemented financial liberalisation procedures and maintained a low interest rate spread during the implementation of the financial reform programme. In addition, “the indirect bank-specific assistance in the form of Treasury bills, the bulk of which has been held by commercial banks … enabled the banks to avoid “high provisions” and the need for wide spreads between lending and deposit interest rates” (Arestis, 2003, P. 15). Subsequently, the spread started to decline during the 1990s to its lowest percentage at 3.6% in 1998, while it marginally rose during the first half of the year 2000 and fell afterwards to 4.2 % in 2011. However, it is noteworthy that the interest rate spread in Egypt was less than the corresponding one in low and middle income countries, except during the period 1989-1992 (see Figure 5.6).

Figure 5.6. The Spread between Lending and Deposits Rates



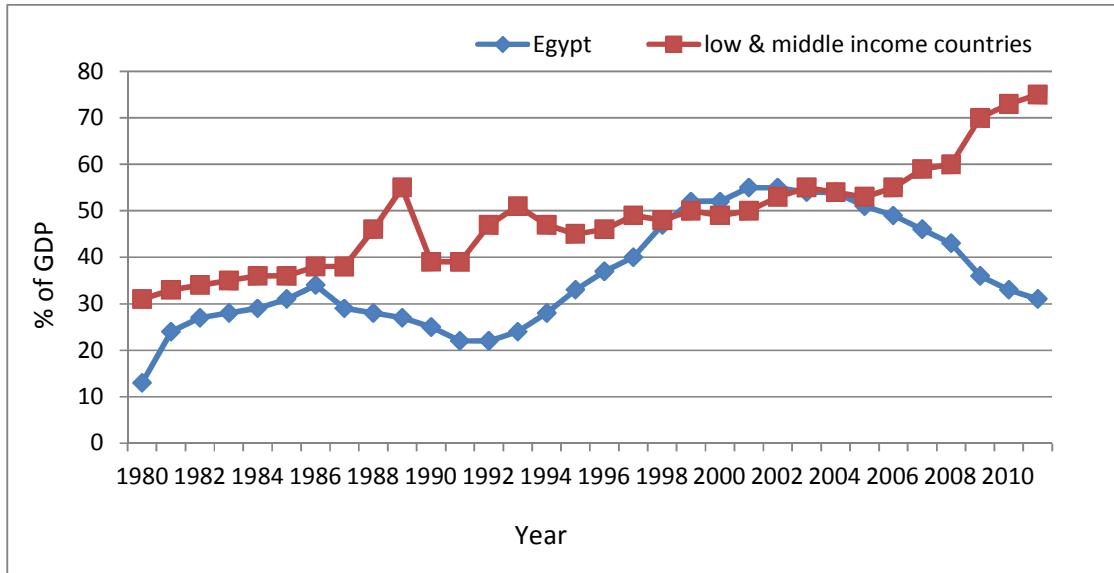
Source: World Bank (2013).

As regards pro-competition policies, various privatisation programmes and regulations were passed during 1993. They aimed at strengthening the financial market competition through removing entry barriers for domestic and foreign banks, in which foreign banks were permitted to get involved in domestic financial activities and ownership through

establishing new branches in the Egyptian economy. In 1994, the monetary authority forced the four public banks to weed out their shares in 23 joint venture banks or at least to cut it to less than 51%.

Furthermore, in 1997 and in an attempt to boost competition and strengthen the domestic financial sector to be capable of competing with the global financial sector, banks were required to adopt the International Accounting Standards (IAS) in their accounts and increase transparency by pledging to publish their financial statements regularly. In June 1998, further banking regulations and laws were revised in order to expand private and foreign ownership in the financial system. As a result, several state-owned and joint venture banks were privatised. On the one hand, the four public banks were obliged to cut their investments and shares in the joint venture banks to less than 20%, and on the other hand, the share of foreign ownership for financial institutions was allowed to exceed 49% from the total share (Roll, 2010). Hence, the share of foreign banks to the total number of banks in the Egyptian financial sector increased from 3% to 20% during the period 1995-2002 (Lee, 2002).

Moreover, in December 1990 the reserve requirement ratio held by banks at the CBE was reduced to 15 % of the total Egyptian pound and foreign deposits compared to 25 % prior to the financial reform. Similarly, in December 1993, the reserve requirement ratio of foreign deposits held by banks at the CBE was further reduced to 10 % in order to boost the credit provided by banks to the private sector. Besides, credit ceilings and directed credit programs were abolished for the private sector in October 1992 and for the public sector in July 1993 in order to boost credit to the private sector. Consequently, during that period the credit to the private sector as a share of GDP witnessed a constant increase from 22% in 1991 to reach its peak at 55% by the end of 2002, which brought Egypt closer and to some extent higher than the private credit ratio in low and middle income countries (see Figure 5.7).

Figure 5.7. The Domestic Credit to Private Sector (GDP %)

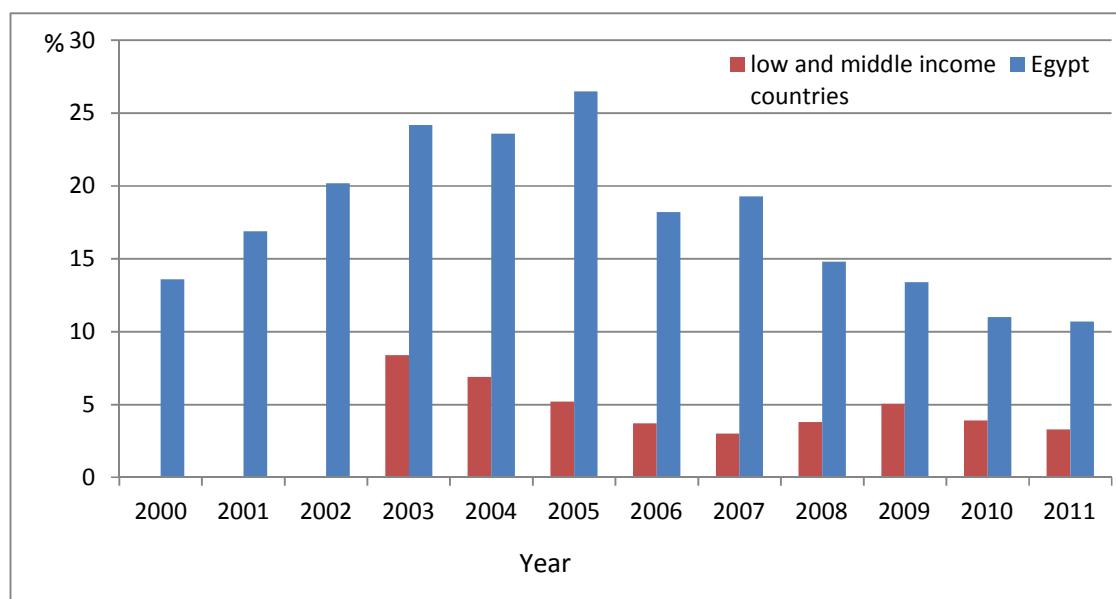
Source: World Bank (2013).

However, these measures did not boost the investment and economic growth rate. As “Until 2003 ... several public shares in joint venture banks were sold; yet despite this, more than half of the 35 joint venture banks were still majority-owned by the public sector ... moreover the state maintained some minority ownership in all of the privatised banks, and above all, none of the four market-dominating public banks were privatised” (Roll, 2010, P. 353). Furthermore, the process of credit provision and financial resources allocation at the banking system were extremely poor and inefficient. Therefore, the ratio of Non-Performing Loans (NPL) to the total gross loans continued to increase and reach the highest level at 26.5 % in 2005 compared with 5.2% in low and middle income countries in 2005 (see Figure 5.8). This could be attributed to financial liberalisation measures that enhanced the financial competition through removing entry barriers for domestic and foreign banks and inspiring financial institutions proliferation leading to moral hazards and accumulated non-performing loans at the banking sector.

On that basis, the Egyptian government adopted more comprehensive measures of financial and economic policies at the beginning of 2003 including a free floatation of the Egyptian pound through a free exchange rate policy. As it comes to the financial system, a new financial legislation was passed later in July 2003. It aimed at regulating and restructuring

the banking industry in order to enhance the financial services and capital allocation efficiency through extensively privatising all the joint venture banks owned by the state and providing more authority to the Central Bank of Egypt (CBE) in monitoring, supervising and regulating the financial market. For this end, the number of banks at the Egyptian economy reduced dramatically from 61 in 2004 to 39 in 2008 (Central Bank of Egypt, 2012); whereas, the foreign-owned banks significantly increased from 5 to 15 during the same period (Roll, 2010). These privatisation measures reduced the number of state-owned banks and positively affected the balance sheets of banks and the credit allocation efficiency. Hence, the ratio of Non-Performing Loans to total gross loans (NPL) constantly decreased from 26.5% in 2005 to 10.7% in 2010 compared to merely 3.3% in 2011 in low and middle income courtiers (see Figure 5.8). Therefore, it is notable that the Egyptian banks' balance sheets remained poor and heavily strained with high NPL compared to low and middle income courtiers. Besides, the drop in the NPL ratio was due to credit constraints rather than enhancing the efficiency of credit supply process; whereas, the ratio of the private credit to GDP continually contracted from 54% in 2004 to 31% in 2011 (see Figure 5.8).

Figure 5.8. Bank Nonperforming Loans to Total Gross Loans (%)



Source: World Bank (2013).

5.4.2 The Stock Market Development

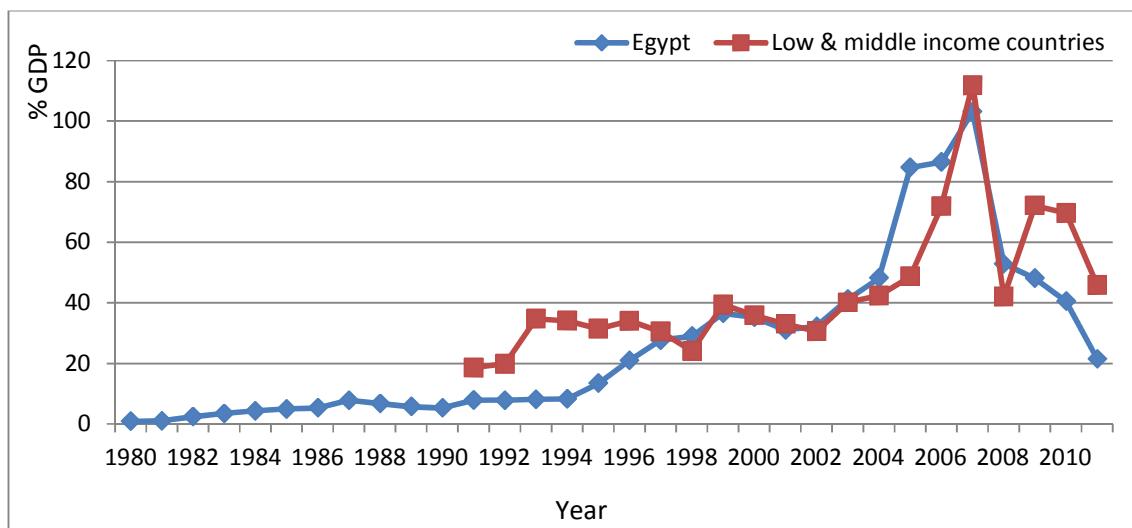
The Egyptian stock market consists of two separate stock exchanges in Cairo and Alexandria. The Alexandria stock market goes back to 1883, whilst the Cairo stock market was established in 1903. During the World War II in the 1940s the Egyptian stock market was very active and classified as the fifth most active market in the world. However, as a result of the central planning policies and the nationalisation process that took place during the mid-1950s and 1960s, the majority of large and active corporations were nationalised and their stocks were transferred into government bonds with 4% interest rate for 15 years (Bolbol et al., 2005). Consequently, the stock market remained passive and undeveloped for the following two decades.

Furthermore, the open-door policy adopted during the mid-1970s and 1980s did not add much due to “biases in the tax code against investment in securities, absence of a governing securities’ law, inadequacy of financial disclosure, lack of protection of small investors, and the adverse economic conditions” (Bolbol et al., 2005, P. 182). Therefore, the Egyptian stock market remained small and showed no significant activity until the early 1990s when the Egyptian government implemented the financial liberalisation programme. One key dimension of the financial reform programme was the development of stock market. For this end, the government enacted the Capital Market Law by means of reviving both the Cairo and Alexandria stock markets. The Capital Market Law No.95 of 1992 aimed at eliminating all restrictions on foreign transactions at the stock market, allowing banks to play a significant role in developing the stock market through the introducing of mutual funds, regulating trading and issuance of securities and market participants operations. It also aimed at initiating the Capital Market Authority (CMA) to regulate and monitor market activities, supervise the stock market development, protect minority shareholders, and enforce the legal framework of the market.

As a result, the Egyptian stock market started to grow very rapidly as an alternative channel for corporations to finance their capital needs and witness a significant growth in the size, activities and liquidity indicators. The Capital Market Law No.95 markedly increased the foreign investors’ participation and confidence in the market due to the privatisation programme and initial public offerings (IPOs) for state-owned projects alongside improving

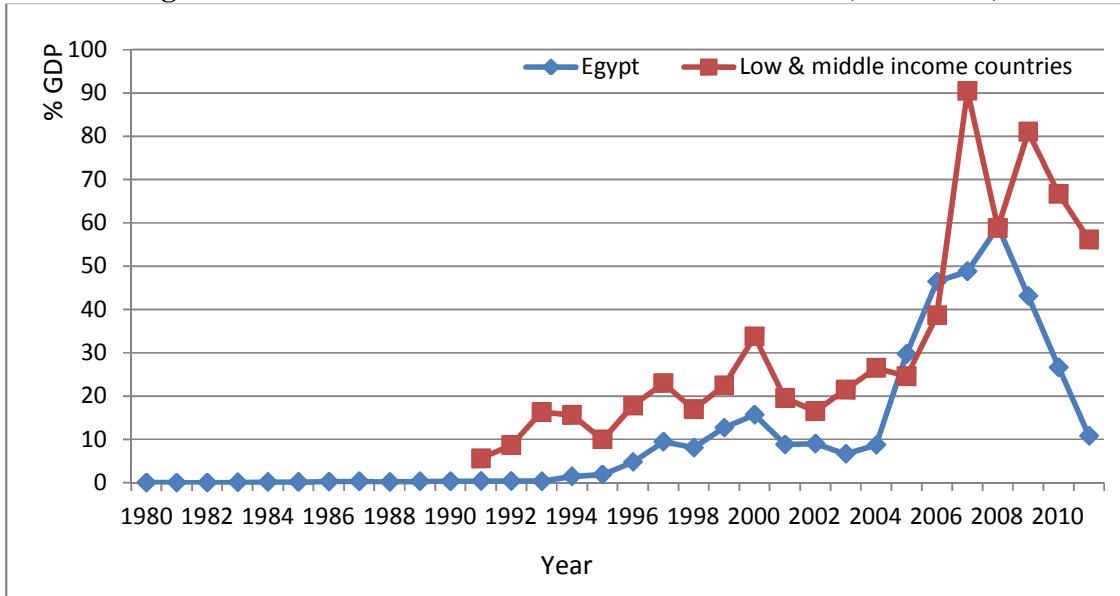
the regulation system. Henceforth, financial liberalisation policies and particularly stock market reforms encouraged strong and rapid growth at the stock market capitalisation as a share of the GDP (see Figure 5.9). It grew very rapidly from 7.8% in 1991 to 32.2% in 2002 and reached the peak point of 103.1% in 2007. Then, it started to decline afterwards to 52.8 % in 2008 due to the global financial crisis and continuously fell to 21.4% in 2011 due to the Egyptian revolution on 25th January 2012 and political instability.

Figure 5.9. Market Capitalisation of Listed Companies (% of GDP)

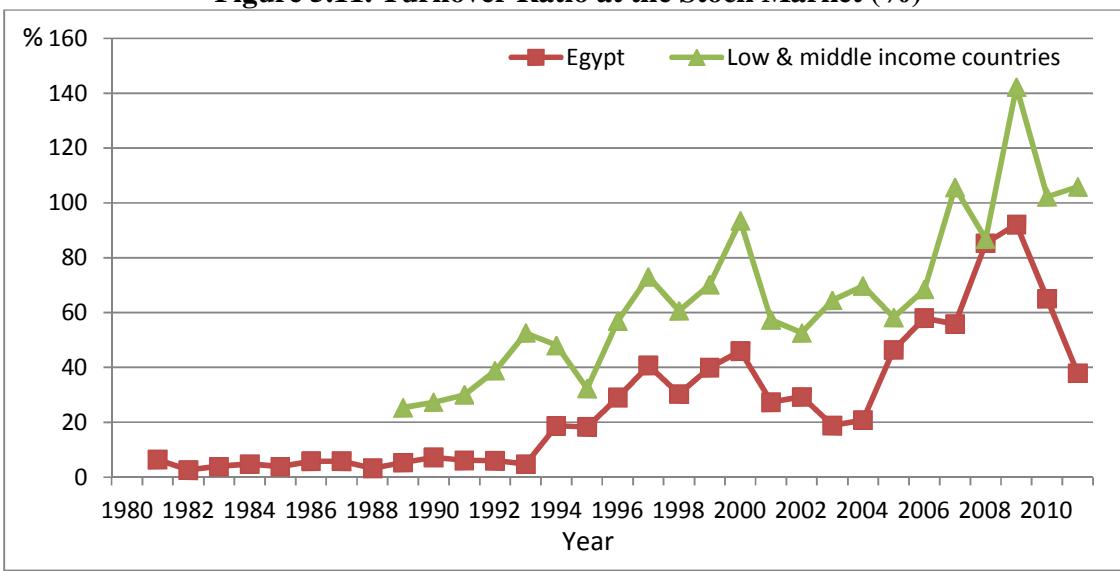


Source: Egyptian Capital Market Authority (ECMA), Arab Monetary Fund (AMF) and World Bank (2013).

Similar conclusions could be obtained from analysing the development of the total value traded ratio and the turnover ratio at the market during the same period (see Figure 5.10 and Figure 5.11). At the beginning of the financial reform programme, the total value traded ratio and the turnover ratio escalated gradually from 0.4% and 6% in 1991 to 16% and 46% in 2000 respectively. In the meantime, the Central Depository Law No.93 of 2000 established Misr, Clearing, Settlement and Central Depository Company (MCSD) as a self-regulatory entity subject to CMA supervision that aimed at implementing the central depository system to facilitate trading of securities, enforce its role as a shareholder record keeping, and regulate clearing and settlement operations at the market.

Figure 5.10. Total Value Traded at the Stock Market (% of GDP)

Source: Egyptian Capital Market Authority (ECMA), Arab Monetary Fund (AMF) and World Bank (2013).

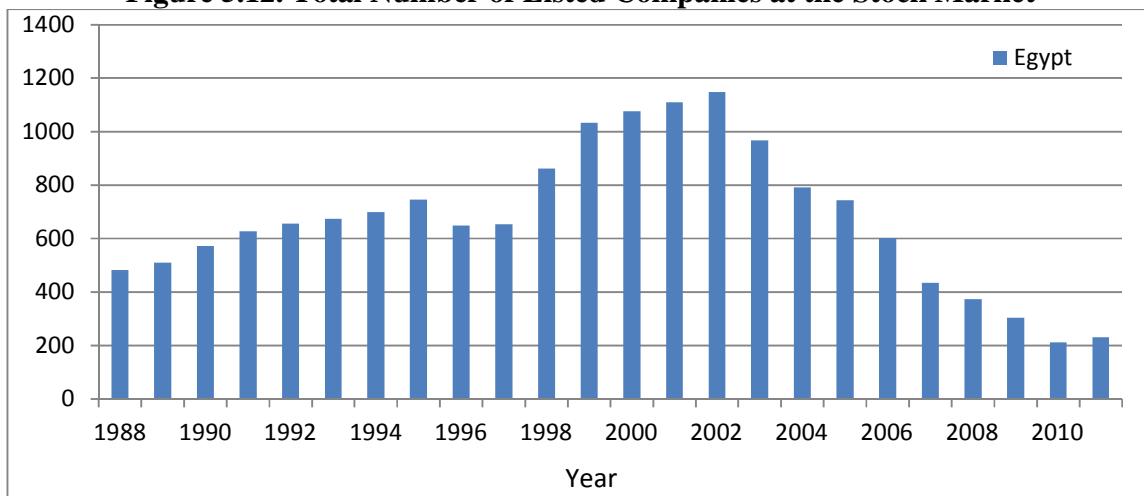
Figure 5.11. Turnover Ratio at the Stock Market (%)

Source: Egyptian Capital Market Authority (ECMA), Arab Monetary Fund (AMF) and World Bank (2013).

In 2005 the stock market was observing more active trading activities compared to those in 2003 and 2004. It is noteworthy that during the period 2005-2009, the value traded and turnover ratios increased swiftly towards peak and achieved the maximum value at 59% in 2008 and 92% in 2009 respectively. This had been encouraged significantly by the

implemented privatisation measures, initial public offerings (IPOs) and new listings of several high-profile projects such as Alexandria Mineral Oil and Telecom Egypt which, in turn, attracted new participants to the market and remarkably expanded the investment base. After three years of a relatively continuous growth, the stock market witnessed a slowdown, in which the total value traded and turnover ratios dropped to 10% and 38% in 2011 due to the global financial crisis and world recession. In addition, the Egyptian stock market activities represented by the value traded and turnover ratios are in general less than their counterparts in low and middle income countries. Additionally, the flourishing in stock market activities during the period 2003-2009 were mainly driven by a small number of companies, particularly large corporations and business elite.¹⁵ The total number of listed companies at the Egyptian stock market significantly fell from 1148 companies at 2002 to 373 in 2008 and continued to decrease to 213 companies at 2010 (see Figure 5.12). Furthermore, most of the corporations' shares were not traded at the stock market and just listed in the unofficial schedule to get benefited from the tax exemptions according to the tax law of 1981.¹⁶

Figure 5.12. Total Number of Listed Companies at the Stock Market



Source: World Bank (2013).

In summary, The pace and process of economic reform in Egypt was mainly determined by the major private sector actors, business elite, who are very wealthy and well connected to

¹⁵ For more details and discussion see Roll (2010).

¹⁶ In 2005, only 132 corporations were listed in the official schedules and 612 companies were recorded in the unofficial schedules, compared with 119 and 213 in 2009.

the regime. Whilst, Small and Medium Entrepreneurs (SEMs), workers and social organisations, that constitutes the majority of the private sector, were excluded and did not participated in drawing the economic reform policies. These organisations are very weak and lack the power to have any influences on the process of economic reform (Farah, 2009).

One obvious example of the close tie between wealth and political power in Egypt is the increasing political power of the Egyptian business elite. In 2005, top entrepreneurial elite took over ministerial positions in the Egyptian government, such as Minister of Foreign Trade and Industry Mohamed Rashid was the president of Unilever's Middle East, North Africa and Turkey businesses, the Minister of Transport Mohamed Mansour, who was the president of Mansour Group, and Minister of Tourism Zoheir Garana, the owner and manager director of Garana Travel Company. Consequently, the financial sector reforms were of primary importance to a few of Egyptian businessmen elite, who got advantages from favourable business terms, the privatisation programme, excessive access to the capital through the development of both the banking sector and stock market. However, empirical literature indicated that such close links between private sector players and the state was not always detrimental to the overall growth performance in some developing countries such as, South Korea, China and for some periods in leading Latin American economies.

In addition, Figure 5.12 showed that the Egyptian stock market was concentrated and dominated by a small number of large corporations. This graph along with Figure 5.8 provides interesting information regarding the background of the Egyptian political economy, where “the business elite also opposed movement toward increased transparency and competitiveness that would open more space for competing actors. It is important to highlight that the reluctance of the business elite was less toward reforms per se; it was rather motivated by a desire to preserve the early benefits of reform and to maintain their influence in the economy” (Alissa, 2009, P. 9-10). Furthermore, “capital market development not only offered new possibilities for corporate financing, but also for criminal acts, such as the manipulation of share prices or insider trading. In this connection, it was not just weak legal regulation that facilitated a variety of abuses of insider information but also the fact that between 1992 and 2008, no single conviction took

place”(Roll, 2010, P. 361). However, little efforts were devoted for fighting corruptions and curbing the power of Egyptian business elite.

The relationship between the state and the level of corruption play an important role of the evolution and the impact of the financial reform in the case of developing countries and in particular, Egypt during the transitional period. Khan (2006) identified four types of corruptions. These distinctions between different forms of corruptions are very crucial for analysing the impacts of various types of corruptions and determine the most appropriate anti-corruption policies in each case or even identify the cases where certain types of corruption would not be responsive to any strategies. This should be based on whether the state interventions are essential for achieving some economic or political objectives and whether the interventions are legally permitted or not. In other words, “in each case, the policy response has to be based on a proper analysis of the types of corruption that dominate and target the strengthening of state capacities that are most important for creating governance capacities required for achieving rapid transformation and high growth rates” (Khan, 2006, P. 17).

On the other hand, empirical literature indicate that corruption might coexist with high economic growth as “it was part of a system of “primitive accumulation” through which a new class of capitalists emerged with strong state assistance and often in collusion with state leaders” (Khan, 2002, P. 3). Nevertheless, this should not be understood as that corruption in these countries is functional and considered enhancing-growth factor (Khan, 2006).

It is notable that during the process of the financial liberalisation programme the Egyptian stock market had a prominent booming in terms of size, activities, and turnover. Nevertheless, the development of the Egyptian stock market did not offer a solid ground for physical capital accumulations as an alternative channel through which the private sector can raise its capital needs and finance investment opportunities and projects.

5.5 Conclusions

The outcomes from the financial reform programme implemented during the last two decades in Egypt did not meet the expectations according to McKinnon-Shaw framework. Financial liberalisation policies would boost savings mobilisation, capital accumulation, the

efficiency of capital resources allocation and hence the economic growth rate through promoting the efficiency of financial services, financial market competition and the development of financial system. Although the financial reform programme has a positive impact on size, activities and development of the financial system, it has a negative impact on savings and investment in Egypt.

The analysis of the Egyptian financial system confirms the view that the Egyptian large corporations and businesses elite got more benefits from the financial liberalisation programme initiated in the 1990s compared to other participants in the private sector. In the first phase (1991-2002) through the extension of the capital resources allocation and preferential credit supply to the private sector in which the financial resources were channelled far from the public sector to the private sector, and secondly by changing the ownership and the structure of the financial system through the privatisation of state-owned banks restrictions, private and foreign banks intervention and development of stock market were more appreciated. Entrepreneurs who are politically well connected have unrestricted access to credit from the banking system where lending decisions were made based on the political clientelism. Furthermore, they got more benefits at the second stage of the financial reform programme (2003-2011) where the Egyptian financial system was restructured through foreign banks intervention and the introduction of the international standards which purely blocked the small and medium enterprises (SMEs) from getting sufficient credit from banks due to the lack of credit history for new SMEs and difficulties that banks face in identifying the creditworthy SMEs in developing countries. Detragiache et al. (2008) indicate that in poor developing countries where the legal system is weak, foreign banks tend to favour large well-known corporations than SMEs due to the lack of local knowledge and standard financial statements.

On the other hand, the credit provided by the banks to the private sector during the financial liberalisation period was not transformed into capital investment. Indeed, the financial liberalisation policy that took place in Egypt constrained the available funds for the business sector through a private credit misallocation in favour of households rather than loans to firms and businesses that resulted in a lower capital accumulation and investment to GDP ratio.

As regards the stock market, for corporations and enterprises to raise their capital needs through the market as an alternative channel for the public banks' lending, they had to bear the cost of financial auditing, security marketing and disclose their information in standard financial statements to the public. However, the majority of small and medium firms lack such information and standard financial statements, and, as a result, will not be able to enter the market and get their capital needs. Whereas, big well-known corporations that developed during the 1990s and fulfilled the international standards had much better opportunities to get fund than SMEs had. Therefore, the Egyptian businessmen elite who were well-connected to the political system got advantages from both the financial liberalisation policies and reform programme aiming at the banking system reform and stock market development.

In summary, this chapter underlines the negative impacts of the financial liberalisation programme on the macroeconomic performance and economic growth rate. Thus, more prudential regulations and supervision are needed in order to strengthen the banking sector balance sheets by improving the process of credit accreditation and provision, minimising the moral hazard and direct private credit in favour of loans to firms and corporations rather than consumption and households needs. Regarding the stock market development, a large volume of activities does not only offer a new channel for corporations to raise capital and finance investments, but also creates opportunities for speculative activities and trading of existing assets. Thus, further comprehensive regulatory changes and a robust institutional framework should be considered in order to protect shareholders and direct stock market activities to finance physical investments and productive resources rather than speculative purposes.

6 Financial Development and Economic Growth: An Empirical Analysis for Egypt

6.1 Introduction

On the basis of theoretical and empirical discussion in chapters 2, 3 and 5, this chapter aimed at investigating the relationship and the causality pattern between financial system development and economic growth which, in the case of Egypt, was of paramount importance to policy makers. In particular, did the causal relationship run from financial development to economic growth and/or did it run from economic growth to financial development?

In recent years there has been extensive theoretical and empirical debate on the role of financial development in promoting economic growth. However, conflicting results from various empirical studies at different levels; country group and specific country study, using several econometric techniques could not help to reach a concrete conclusion. Indeed, the empirical results are ambiguous and vary according to the choice of financial development variables, function form, estimation method and data frequency (Khan and Senhadji, 2003, Kar and Pentecost, 2000b). In addition, these theoretical and empirical debates not only indicate that there no agreement on the role of finance in economic growth, but also the direction of the causal pattern between finance and growth.

This chapter contributes to the empirical literature on financial development and economic growth by two aspects. First, for the best of our knowledge, this empirical chapter would be the first attempt to investigate the relationship between financial development and economic growth for Egypt that takes into account the impact of both the banking sector and stock market simultaneously. Secondly, theoretical and empirical studies that investigate the relationship between financial development and economic growth in the case of Egypt were occasional and insufficient. The theoretical studies were limited to descriptive analysis whereas the empirical studies are subject to a number of deficiencies such as limited data availability and as a result their findings, conclusions and policy implications could be misleading somehow. Therefore, this empirical chapter tend to fill the gap in the literature through examining the finance-growth nexus in the context of Egypt

with the most recent available data and accurate measure for financial development based on principal component analysis in multivariate time series model.

The objectives of this empirical chapter are three fold. Firstly, examine the dynamic relationship between financial system development and economic growth and how these two variables are linked in the long-run. Secondly, investigate the direction of causality between finance and growth in both short-run and long-run. In particular, does the causal relationship run from financial development to economic growth and/or does it run from economic growth to financial development. Thirdly, to what extent banks and/or stock market is more conducive to higher economic growth. The sensitivity of the empirical results is then checked using banking and stock market indices that constructed by Principal Component Analysis technique.

To this end, this chapter is organised as follows. Section 6.2 explores the theoretical foundation of the econometric methodology used. Section 6.3 discusses variables constructions and data sources. Section 6.4 presents the empirical results from VEC model and Granger causality on the relationship between financial development and economic growth, while concluding remarks and policy recommendations are discussed in the last section.

6.2 The Econometric Methodology

Based on the finance-growth literature review, the relationship and causality direction between financial development and economic growth could be examined using the following model:

$$LY = f(BS, SM) \quad (6.1)$$

Where Y refers to the real GDP measured in logarithm so that it can be interpreted as the economic growth rate after taking the first difference. BS represents the banking sector measures whereas SM indicates the stock market indicators.

Time series technique has been adopted, since time series approaches deal with the specificity of an individual country and offer the opportunity to show and analyse the causality pattern between variables. To this end, Cointegration and Vector Error Correction

Model (VECM) are utilised to estimate the previous model. Moreover, Granger causality tests have been applied within a framework of VECM in order to test the direction of causality between financial development and economic growth.

Cointegration and Vector Error Correction Model (VECM) approach fits well with the purposes of this empirical chapter as it gives the opportunity to examine both the relationship and causality direction between financial development and economic growth in short-run and long-run. Furthermore, the estimated parameters using VEC model are super-consistent. In other words, the consistency of the coefficients will hold even if the independent variables are serially correlated with the error term in the regression. Thereby, the VEC model avoids any issues arising from the endogeneity problem. So therefore, in order to test the relationship and the direction of causality between our variables, the following procedures have been applied.

6.2.1 Stationary Properties of the Variables

The properties of the time series could be investigated using two different approaches, namely, unit root tests and stationary tests. Unit root tests examine the null hypothesis that the time series under consideration is $I(1)$, in which case the time series is non-stationary against the alternative. Whilst, stationary tests investigate the null hypothesis that the time series under consideration is $I(0)$, that is stationary.

6.2.1.1 Unit Root Tests

The assumption of stationary variables is crucial for the properties of the OLS estimators to hold. If the variables under consideration are non-stationary this might result in spurious regression, where two non-stationary variables are spuriously correlated as a result of both are trended (Verbeek, 2008). Thus, the OLS estimators could be misleading as the distribution of t and F-statistic does not follow the standard distribution under the stationary assumption.

Empirical analyses based on time series data assumes that time series variables are stationary. However, most macroeconomic time series are non-stationary which on the one hand may lead to spurious regression if non-stationary variables used, and on the other

hand invalidating the empirical results and inferences drawn from estimation. Unit root tests are very important tools to identify the univariate properties of the time series to detect the presence of non-stationary and make sure that the time series variables have the right stationary properties.

Non-stationary time series may have deterministic trend, or it may have stochastic trend, or it may have both. Therefore, Augmented Dicky-Fuller (ADF) test developed by Dickey and Fuller (1981), involves estimation of one of the previous three specifications based on the properties of the time series, which reflect the possibilities of time series equation, under the null hypothesis: $H_0: \delta = 0$ (there is a unit root or the time series is non-stationary) against the alternative: $H_1: \delta < 0$ (there is no unit root or the time series is stationary):

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^k \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (6.2)$$

$$\Delta Y_t = \alpha_1 + \delta Y_{t-1} + \sum_{i=1}^k \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (6.3)$$

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \sum_{i=1}^k \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (6.4)$$

Where: Y is time series data, t is the trend variable (time), ε_t is a pure white noise error term and follow the standard normal distribution ($\varepsilon_t \sim i.i.d$). Moreover, the lagged values of the dependent variable (ΔY_t) are included in order to avoid serial correlation in the error terms and obtain an accurate and unbiased estimate of (δ). Before proceeding to the estimation, Akaike information criteria (AIC) and Schwarz Information Criteria (SIC) should be employed in order to choose the right structure of ADF equation in terms of the inclusion of intercept (α_1), trend (t) and the number of lags of the dependent variable (ΔY_{t-i}).

If the absolute value of the calculated ADF statistic is less than the absolute value of the critical ADF statistic (MacKinnon critical value) then the null hypothesis that: $H_0: \delta = 0$ can't be rejected. In other words, there is a unit root in the time series or the time series is non-stationary. Otherwise, the null hypothesis is rejected and the time series is stationary. Therefore, the order of cointegration $I(d)$, could be defined as the number of times (d) that a time series variable should be differenced in order to be stationary. For example, the variable is integrated of order one, $I(1)$, if it should be differenced once to be stationary.

6.2.1.2 Stationary Test

Kwiatkowski, Phillips, Schmidt and Shin (1992) introduce KPSS stationary test based on a model in which a time series consists of three components, a deterministic trend, random walk, and stationary error as follows:

$$Y_t = \alpha + \beta t + \mu_t + u_t \quad (6.5)$$

$$\mu_t = \mu_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim iid (0, \sigma_\varepsilon^2) \quad (6.6)$$

Using Lagrange Multiplier (LM) to test the null hypothesis that the random walk has zero variance: $H_0: \sigma_\varepsilon^2 = 0$, in which case the time series is stationary. Against the alternative: $H_1: \sigma_\varepsilon^2 > 0$, that is the time series is non-stationary:

$$KPSS = T^{-2} \sum_{t=1}^T \hat{S}_t^2 / \hat{S}_{ut}^2 \quad (6.7)$$

Where: $\hat{S}_t = \sum_{j=1}^t \hat{u}_j$ and \hat{S}_{ut}^2 is a consistent estimator of long-run variance of (u_t) . Then, the statistical value should be compared with the critical values tabulated in KPSS(1992). If the computed statistical value is less than the asymptotic critical value then the null hypothesis is not rejected. Otherwise, the time series is non-stationary.

6.2.2 Cointegration Test

Non-stationary variables are cointegrated if there is a linear combination of them that is stationary $I(0)$. In other words, they share the same stochastic trend and have a stable long-run relationship. In such case, OLS estimators are said to be super consistent. If it is established that all variables under consideration are $I(1)$, we can proceed to the second step by testing for the long-run relationship between financial development and economic growth using Johansen multivariate cointegration tests (Johansen and Juselius, 1990) based on Vector Autoregressive Model (VAR), where all variables treated as endogenous and each variable regressed on a linear combination of lagged values of itself and all other variables. To this end, a VAR model involving up to (p) lags of (k) time series variables can be written as follows:

$$Y_t = c + \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \dots + \Pi_p Y_{t-p} + u_t \quad t = 1, \dots, T \quad (6.8)$$

Where, Y_t is a $(k \times 1)$ vector of endogenous time series variables, c is a vector of constant, Π_i is a $(k \times k)$ matrix of coefficients, and u_t is a $(k \times 1)$ vector of white noise terms. Sims (1980) recommends applying VAR model to estimate the long-run dynamic relationship between variables as it is more parsimonious, accurate forecasting as its incorporate past information for all variables included in the model, and avoid making a distinction between endogenous and exogenous variables (Verbeek, 2008). Moreover VAR model is a reduced form, therefore there is no need to impose priori restrictions to assure identification (Harris, 1995).

According to Engle and Granger representation theorem (1987) if variables are non-stationary and cointegrated of order one, $I(1)$, then the short-run relationship between them can be represented by Error Correction Mechanism (ECM) that describes the short-run dynamic of the variables towards its long-run relationship. Consequently, the VAR model can be reformulated as Vector Error Correction Model (VECM) such that:

$$\Delta Y_t = c + \Gamma_1 \Delta Y_{t-1} + \dots + \Gamma_{p-1} \Delta Y_{t-p+1} + \Pi Y_{t-1} + u_t \quad (6.9)$$

This model involves information on both short-run and long-run relationship between variables through estimation of $\Gamma_i = -(I - \Pi_1 + \dots + \Pi_{p-1})$ and $\Pi = -(I - \Pi_1 - \dots - \Pi_p)$ respectively (Harris, 1995). Where Γ_i is $k \times k$ matrix that represents the coefficients of the short-run dynamics, Π is $k \times k$ matrix expresses the long-run coefficients and it is of paramount interest, c is an $k \times 1$ vector of constants, ΔY is an $k \times 1$ vector of variables in their first difference, which are stationary, $I(0)$. Accordingly, (ΠY_{t-1}) should be stationary for the error term (u_t) to be stationary or white noise. In fact, in such case, there are three different possibilities. First, if all variables are cointegrated of order one, $I(1)$, and there are no long-run cointegrating relationship, then the rank of $(\Pi = 0)$. Second, if all time series variables are stationary, $I(0)$, in that case (Π) has a full rank $(\Pi = k)$. Third, if (Π) has a reduced rank, that is $(0 < r < k)$ then there are linearly independent cointegrating vectors among the variables that are stationary and it said that there are (r) cointegrating relationships. In that case, (Π) can be written as the product of two sub-matrices such that:

$$\begin{matrix} \Pi \\ (k \times k) \end{matrix} = \begin{matrix} \alpha & \beta \\ (k \times r)(r \times k) \end{matrix} \quad (6.10)$$

Where α denotes the speed of adjustments to the long-run relationship from disequilibrium or shock in the short-run. Hence, econometricians call it error correction coefficients. While β is a matrix representing the long-run coefficients or cointegrating relationships. Therefore, testing for the existence of long-run cointegrating relationships is equivalent for testing the rank of matrix(Π).

6.2.2.1 Johansen's Cointegration Approach

Johansen cointegration test presented by Johansen (1988, 1990) tests the number of cointegrating relationships (r) between non-stationary variables or the number of columns in (β) based on estimation of restricted Vector Error Correction Model (VECM) for a given value of (r) using Maximum Likelihood procedure which corrects for autocorrelation and endogeneity problems. In this regard, the Maximum Likelihood estimation for (β) is equivalent to having (r) eigenvectors which are related to (r) largest eigenvalues ($\hat{\lambda}_1 \geq \hat{\lambda}_2 \geq \dots \geq \hat{\lambda}_k$) of ($k \times k$) matrix. In other words, testing the existence of (r) cointegrating relationship is equivalent to test that ($\hat{\lambda}_{r+1} = \dots = \hat{\lambda}_k = 0$) whereas ($\hat{\lambda}_1, \dots, \hat{\lambda}_r > 0$). So it must be the case that $[\log(1 - \hat{\lambda}_j) = 0]$ for $j = r + 1, r + 2, \dots, k$ (Harris, 1995, Verbeek, 2008).

Johansen (1991, 1995) has developed two log-likelihood ratio statistics for testing the number of cointegrating relationship or the rank of matrix(Π) that commonly has become known as *trace* statistic (λ_{trace}) and *maximal eigenvalue* statistic (λ_{max}). First, the trace test examines the null hypothesis that there are at most r cointegrating relationship among variables ($H_0: r \leq r_0$) against the general alternative one that ($H_1: r_0 < r \leq k$).

$$\lambda_{\text{trace}}(r_0) = -T \sum_{j=r_0+1}^k \log(1 - \hat{\lambda}_j) \quad r_0 = 0, 1, 2, \dots, k-1 \quad (6.11)$$

On the other hand, maximal eigenvalue test investigates the null hypothesis that there are r cointegrating relationships exists among variables ($H_0: r = r_0$) versus the restrictive alternative that is ($H_1: r = r_0 + 1$).

$$\lambda_{\text{max}}(r_0) = -T \log(1 - \hat{\lambda}_{r_0+1}) \quad r_0 = 0, 1, 2, \dots, k-1 \quad (6.12)$$

Therefore, in order to determine the number of cointegrated vectors. The null hypothesis ($H_0: r = 0$) is tested against the alternative ($H_1: r = 1$). If λ_{\max} statistical value is smaller than critical value, then the null hypothesis of no cointegration is not rejected. In other words, there is no cointegrating vector (long-run relationship) among variables. Otherwise, the alternative hypothesis is accepted, there is at least one cointegrating vector. In such case, the null hypothesis ($H_0: r = 1$) is tested against the alternative ($H_1: r = 2$) and so forth till the point where the null hypothesis is not rejected.

Both statistics are non-standard, so their critical values have been tabulated in Johansen et al. (1995) and Osterwald-Lenum (1992) using stochastic simulations. However, in small sample, these tests are often biased towards cointegration even when the null is true. So, a small sample correction was presented by Ahn and Reinsel (1990) and Reimers (1992) suggesting that both test statistics should be multiplied by $(T - pk)$, where (p) is the number of lags to account for the number of parameters estimated at the model (k) .

Furthermore, Johansen procedure is very sensitive with respect to the choice of the order of lags, optimal lag length that will be included in the VAR model, and the inclusion of an intercept and/or a trend. Indeed, choosing too few lags in the model will simply result in rejecting the null hypothesis often. Contrary, including too many lags will lead to loss of degrees of freedom and the power of the tests. Therefore, the model should be estimated with different lag length and compares the results to identify the actual number of cointegrating vectors r . Then, the final step involves estimating the long-run relationships (cointegrating vectors in Π) and the error-correction representation by maximum likelihood and compares the results with the economic theory.

6.2.3 Granger Causality

The Granger causality test was introduced by Granger (1969). This test is a statistical test that examines whether or not a time series is helpful in predicting another based on linear regression models. Therefore, Granger causality tests reflect the correlations between time series variables rather than revealing causality in any true sense

. In other words, the Granger causality means that the information of past values of one variable (X) helps to explain the current value and improve the prediction of another

variable (Y): this is expressed as saying X is said to Granger cause Y. Otherwise, if all of the coefficients of the lagged variables of X (β_j) are zero in the equation for Y, then it is said that X fail to Granger cause Y.

The simple model of Granger causality test could be written as follows:

$$Y_t = a_{10} + \sum_{j=1}^k \eta_j Y_{t-j} + \sum_{j=1}^k \beta_j X_{t-j} + u_t \quad (6.13)$$

$$X_t = a_{20} + \sum_{j=1}^k \alpha_j Y_{t-j} + \sum_{j=1}^k \gamma_j X_{t-j} + v_t \quad (6.14)$$

Where the null hypotheses to be tested are:

$$H_0: \beta_j = 0 \text{ and } H_0: \alpha_j = 0$$

Against the alternative that:

$$H_1: \beta_j \neq 0 \text{ and } H_1: \alpha_j \neq 0$$

To test for Granger causality in this system, alternative causal relations are likely to be found: (i) there is unidirectional Granger causality from X to Y, if not all (β_j) are zero, but all (α_j) are zero. (ii) There is unidirectional Granger causality from Y to X, if all (β_j) are zero, but not all (α_j) are zero. (iii) There is two-way Granger causality between X and Y, if neither (α_j) nor (β_j) are zero, which means that they are jointly determined. (iv) There is no Granger causality between X and Y, if all (α_j) and (β_j) are zero.

However, several studies (Engle and Granger, 1987, Toda and Yamamoto, 1995, Tsen, 2006) indicate that using the traditional Granger causality test to examine the direction of causality (in the sense of Granger) between variables is not appropriate if the variables under investigation are non-stationary and cointegrated. In this case, a simple F-test is no longer valid as it does not have a standard distribution (Jordaan and Eita, 2007). Therefore, in view of the fact that most of macroeconomic time series are non-stationary and cointegrated the causality pattern should be analysed on the basis of VECM which gives the opportunity to address and analysis the causality direction in both short-run and long-run as follows:

$$\Delta Y_t = \sum_{j=1}^k \alpha_j \Delta Y_{t-j} + \sum_{j=1}^k \beta_j \Delta X_{t-j} + \phi_1 \varepsilon_{1t-1} + u_t \quad (6.15)$$

$$\Delta X_t = \sum_{j=1}^k \eta_j \Delta Y_{t-j} + \sum_{j=1}^k \gamma_j \Delta X_{t-j} + \phi_2 \varepsilon_{2t-1} + v_t \quad (6.16)$$

Where (ε_{1t-1} and ε_{2t-1}) are lagged values of the error terms from the long-run cointegration relationships. According to Granger (1988), two possible channels of causality between variables can be identified using the VECM, either through the error correction terms (ε_{1t-1} and ε_{2t-1}), and/or lagged variables (ΔY_{t-j} and ΔX_{t-j}). The significant of the coefficients of error correction terms could be examined using t-statistics which indicates the presence of long-run Granger causality. Whereas, the significant of coefficients of lagged explanatory variables are analysed using F-statistics which show the existence of short-run Granger causality.

6.3 Variables Construction and Data Sources

6.3.1 Measures of Financial Development and Economic Growth

One of the major problems connected with assessing empirically the finance-growth nexus is how to obtain accurate measures of financial development. This problem arises from the definition of financial development. For instance, Levine argue that “financial development includes improvements in the production information about promising investments, monitoring investments and implementing corporate governance, easing trade, diversification and risk management, mobilization and pooling of savings, and exchange of goods and services. Each of these functions may affect savings and investment decisions and hence economic growth” (Levine, 2005). In a similar vein, the Financial Development Report in 2011 defines financial development as “the factors, policies, and institutions that lead to effective financial intermediation and markets, as well as deep and broad access to capital and financial services” (WEF, 2011, p. 13). However, Čihák et al. (2013, p. 4) point out that the ideal measure of financial development should capture “improvements in the quality of five key financial functions: (1) producing and processing information about possible investments and allocating capital based on these assessments; (2) monitoring individuals and firms and exerting corporate governance after allocating capital; (3) facilitating the trading, diversification, and management of risk; (4) mobilizing and pooling savings; and (5) easing the exchange of goods, services, and financial instruments”.

Thus, several indicators for financial development have been proposed in the literature to capture different aspects and functions of financial system that could be classified into three categories; financial depth, banking sector ratios and financial activities. An extensive empirical literature use different indicators of the overall size of the banking system to measure the financial depth. A large number of studies use the liquid liabilities ratio ($M2/GDP$) as good indicator for the financial depth (See, e.g., Goldsmith, 1969, McKinnon, 1973, King and Levine, 1993a, King and Levine, 1993b, Arellano and Demetriades, 1997, Anwar and Cooray, 2012). However, this measure reflects the degree of monetization inside the economy. Since, it reflects the ability of the financial system to provide and facilitate transaction services rather than the size of the financial intermediaries and their ability to channel funds from surplus units (savers) to deficit units (borrowers). Hence, it could be poor proxies for financial development (Khan and Senhadji, 2003, Levine and Zervos, 1998b). In developing economies with under-developed financial system a large portion of broad money balances ($M2$) is currency held outside the financial system. A higher ratio of broad money to GDP could suggest an extensive use of currency to facilitate transaction services rather than increasing the volume of banking deposits. Whereas, developed countries with low level of monetization ratio could be an indicator to a well-functioning financial system which allows domestic units inside the economy to minimize on their holding money balances (Kar et al., 2011). Therefore, following Demetriades and Hussein (1996b) currency held outside the financial system (currency in circulation) has been deducted from the broad money balances in order to obtain an accurate proxy for financial depth.

Moreover, this proxy is a quantitative measure reflects the ability of the financial system to provide and facilitate transaction services rather than the distribution and the efficiency in allocating capital resources between private and public sectors (Horvath, 2013). Therefore, a more accurate proxy for financial development has been employed to capture the distribution of domestic credit between the economic sectors and evaluate the role of the banking sector in capital accumulation process, that is, the ratio of bank credit to the private sector divided by GDP (Cole et al., 2008, Beck and Levine, 2004a). This measure provides a better view of quality and services provided by the financial sector since it excludes credit

to the government and public enterprises or credit offered by central banks. However, Levine et al. (2000b) indicate that neither private credit ratio nor financial depth can effectively capture the role of financial system in ameliorating market frictions and channelling capital to the most productive projects.

Thus, the ratio of deposit money bank assets to total financial assets (deposit money bank plus central bank assets) has been used in order to precisely assess the relative importance of commercial banks in allocating capital resources and intermediation process within the economy. However, it does not reflect the distribution process of bank credit and to whom banking sector is allocating more credit (Levine, 1997).

As regards financial markets, there has been a remarkable increase in the stock market activities during the last three decades. As a result, several empirical studies started to investigate the effects of stock market development on the level and/or the growth rate of economic activity (Atje and Jovanovic, 1993). Levine and Zervos (1998b) show that well-functioning stock market that trading ownership claims on firms easily and competitively is positively associated with higher economic growth rate.

Since then, several proxies for stock market development have been extensively used in the literature. The most commonly used measures of stock market development in the literature are stock market capitalization ratio (Yu et al., 2012, Shahbaz et al., 2008, Ben Naceur et al., 2008), total value traded ratio (Enisan and Olufisayo, 2009, Levine and Zervos, 1998b) and turnover ratio (Nicola and Funke, 2001, Beck and Levine, 2004a, Barajas et al., 2013). These indicators reflect size, activities and turnover of the stock market. The stock market capitalization ratio, measured as the total value of shares listed in the stock market relative to the GDP, has been employed to represent the size of stock market relative to the overall economy. Secondly, to measure the liquidity of the stock market the total value traded ratio has been estimated as the total value of shares traded at the stock market as a percentage of GDP. Finally, the turnover ratio measured as the total value of shares traded relative to the stock market capitalization which captures the stock market turnover.

The proceeding discussion illustrates that in finance-growth literature there is no consensus regarding the most appropriate measures for financial development. To this end, several

measures for financial development were employed for the purpose of sensitivity and robustness check of the empirical results.

6.3.2 Data Sources

This chapter employ annual data covering the period from 1980 until 2011. The data series for real GDP and banking sector have been collected from International Financial Statistics (2013) of the International Monetary Fund. Whereas, stock market data were collected from Egyptian Capital Market Authority (ECMA), Annual Report, Various Issues, and Arab Monetary Fund (AMF), Arab Stock Markets Database.

6.4 Empirical Results

In the empirical analysis six different measures of financial development are considered that captures different aspects of banking sector and stock market. Namely, the banking sector development is represented by liquid liabilities to GDP ratio, the ratio of private credit to GDP and the ratio of deposit money bank assets to total financial assets. Whereas, the market capitalization ratio, total value traded ratio and turnover ratio have been employed to reflect the development of the stock market.

The initial results indicate the presence of multicollinearity problem due to high correlations between the explanatory variables. Multicollinearity problem arises when two or more explanatory variables are highly correlated in the regression. High correlation between independent variables violates the assumptions of the Classical Linear Regression Model (CLRM). Since, high correlation means large standard error, unstable and insignificant t-ratio for the parameters. This, in turn, leads to accept zero null hypotheses and as a result invalidates the hypothesis tests. Therefore, multicollinearity problem is vital as long as the main research purpose includes investigating the causal relationship between the variables.

6.4.1 The Problem of Multicollinearity

Multicollinearity problem can be identified through examining pairwise correlation matrix, or Variance Inflation Factor (VIF), or Condition indices and Variance decomposition

proportions. The simplest method of detecting the likelihood of multicollinearity problem is examining the correlation matrix, where a high pairwise or cross-partial correlation indicates the existence of a multicollinearity problem.

6.4.1.1 Pairwise Correlation Matrix

The correlation matrices suggest a strong correlation among the explanatory variables in both banking and stock market sectors (see Table 6.1). In the case of banking system variables, Liquid Liability Ratio (LLR) and Private Credit Ratio (PCR) are strongly correlated ($r=0.8$). Moreover, Bank Assets Ratio (BAR) and Private Credit Ratio (PCR) are fairly correlated with ($r=0.6$). On the other hand, there is a high pairwise correlations among Market Value Traded Ratio and each of Market Capitalisation Ratio ($r=0.85$) and Market Turnover Ratio ($r=0.91$).

Table 6.1. Correlation Matrix

Banking system Variables			Stock Market Variables			
	LLR	PCR	BAR	MCR	MVTR	MTR
LLR	1.000			MCR	1.000	
PCR	0.810	1.000		MVTR	0.854	1.000
BAR	0.388	0.587	1.000	MTR	0.754	0.914
						1.000

Source: Author's calculations

High correlations between pairs of explanatory variables indicate potential multicollinearity problems. However, if there is a linear trend involving more than two explanatory variables, pairwise correlation between these variables will be small, yet the multicollinearity problem still exists. Therefore, tolerance and Variance Inflation Factor (VIF) are more favoured techniques than simple correlation for detecting multicollinearity, as they test for multivariate collinearity between variables simultaneously, through regressing each independent variable on all other independent variables in the equation, rather than using partial bivariate multicollinearity.

6.4.1.2 Tolerance and Variance Inflation Factor

Tolerance is the proportion of variable's variance that is not explained by all other independent variables in the model. The higher the intercorrelation between independent variables, the more the tolerance will approach zero. Thus, a small value of the variable's tolerance, $(1 - R^2)$, indicates that the variable under consideration is a perfect linear combination of all explanatory variables included in the model, and therefore it should be deleted from the regression. In other words, all variables with a large tolerance value should be included in the regression model. So, low tolerance value (less than 0.1) and insignificant large standard error of the regression coefficients could be strong evidence for multicollinearity problem.

A formal way of detecting multicollinearity problem in conjunction with tolerance is Variance Inflation Factor (VIF), the reciprocal of tolerance, which quantifies the inflationary impact of multicollinearity problem on the variance and the standard error of the estimated regression coefficients of explanatory variables.

$$VIF_k = \frac{1}{1-R_k^2} \quad (6.17)$$

Where R_k^2 is the R^2 value obtained from regressing the explanatory variable (k) on the remaining explanatory variables in the model. High VIF value indicates high multicollinearity and vice versa. As a general rule of thumb, there are two signs for serious multicollinearity problem. First, VIF value is greater than 10 (or tolerance less than 0.1). However, there is no agreement about the accurate VIF threshold, in a small sample VIF over 2.5 or tolerance under 0.4 might be a good sign for multicollinearity (Allison, 1999). Second, the mean of all VIFs should be considerably greater than one (Kutner et al., 2004, O'brien, 2007).

Table 6.2. Variance Inflation Factor

Banking system Variables			Stock Market Variables		
	Tolerance	VIF		Tolerance	VIF
LLR	0.26	3.80	MVTR	0.11	9.78
PCR	0.34	2.94	MTR	0.16	6.14
BAR	0.64	1.57	MCR	0.27	3.75
Mean VIF		2.77	Mean VIF		6.56

Source: Author calculations

Given our small sample, using 2.5 as VIF threshold indicates that all stock market variables are involved in multicollinearity problem (see Table 6.2). Given that, Variance Inflation Factor (VIF) provides unreliable results. So therefore, condition indices and variance decomposition proportions technique has been used as a more powerful method of detecting multicollinearity problem.

6.4.1.3 Condition Indices and Variance Decomposition Proportions

Condition Index (CI) measures the strength and degree of linear dependency among explanatory variables, which defined as the square root of the ratio of the maximum eigenvalue to each eigenvalue corresponding to the ($X'X$) matrix of the explanatory variables. Hence, condition indices are not for individual variables (like the tolerance and VIF) but are for different dimensions of the explanatory variables.

$$CI_i = \left(\frac{\lambda_{\max}}{\lambda_i} \right)^{1/2} \quad (6.18)$$

As a rule of thumb, a condition index between 10 and 30 indicates moderate multicollinearity. While, a condition index exceeds 30 is an indicator for serious multicollinearity problem (Gujarati, 2003). However, Belsley (1991) highlights that setting the condition index threshold (n^*) should be selected relatively depending on the condition indices pattern that arise from the model itself. Given our short time series($n^* = 5$) has been chosen as a condition index threshold. Since, each dimension involves different linear

combination of the explanatory variables, the pattern of variance decomposition proportions should be examined to identify those variables involved in multicollinearity problem. Thus, a high condition index ($n^* > 5$) associated with a high variance decomposition proportion ($p^* > 0.5$), the threshold for variance decomposition proportion, indicates high linear dependency between the explanatory variables (Belsley et al., 2005, Maddala, 2001).

Table 6.3. Condition Indices and Variance Decomposition Proportion

Banking System Variables					Stock Market Variables				
Condition Index	PCR	LLR	BAR	CONS	Condition Index	MCR	MVTR	MTR	CONS
1	0.003	0.004	0.000	0.001	1	0.010	0.005	0.006	0.016
4.89	0.075	0.108	0.014	0.033	2.67413	0.004	0.034	0.002	0.445
9.90	0.624	0.800	0.007	0.010	5.22689	0.673	0.013	0.213	0.007
23.11	0.297	0.087	0.977	0.955	9.70853	0.311	0.947	0.777	0.530

Source: Author's calculations

The results indicate the presence of multicollinearity problem among banking sector variables, where two condition indices exceeds the threshold($n^* = 5$), which pointing out the existence of two linear dependencies relationships among the explanatory variables. These include $CI_2 = 9.90$, and $CI_3 = 23.11$. However, to find out which variable has been affected adversely by the presence of linear dependencies, variance decomposition proportions should be examined. Beginning with CI_3 , it's clearly that banking assets ratio and constant involved in severe linear dependency, which account for (97.7% and 95.5 %) of the banking assets ratio and the constant variance respectively. Since we are not interested in the constant, banking assets ratio has been excluded from the model. Moreover, CI_2 involve a linear dependency between the liquid liability ratio and the private credit ratio, which damages 80.0% and 62.4% of their variance respectively. So therefore, the liquid liability ratio is omitted from the model. As a result, the private credit ratio (PCR) has been chosen to present the banking sector development.

Similar results were obtained for the stock market variables, where two linear dependencies relationships exist. Two condition indices $CI_2 = 5.22$ and $CI_3 = 9.7$ are greater than the threshold, $n^* = 5$, and associated with high variance decomposition proportion ($p^* = 0.67$ and $p^* = 0.95$) respectively. Consequently, market turnover ratio (MTR) has been selected as a good indicator to express the stock market development, since market value traded ratio and market capitalisation ratio are found to be involved in severe multicollinearity and as a result removed from the regression.

There are two ways to rectify the multicollinearity problem. Firstly, removing some of the variables in the model based on Condition indices and Variance Decomposition Proportion criteria. Using these criteria we left up with two variables, which present the development in the financial system, namely Private Credit Ratio (PCR) and Market Turnover Ratio (MTR). Secondly, banking measures and stock market indicators have been merged into two indices using Principal Component Analysis (PCA). The outcome of this process will be identified as the Banking Development Index (BDI) and Stock Market Development Index (SDI).

In the first scenario, the model will explains less variance and as a result findings might be biased due to omitted variables and misspecification of the model. However, in the second case, using PCA to create an index for each sector based on uncorrelated linear combinations of weighted variables (the variables weighted by their eigenvectors) will give us the opportunity to explain the maximal amount of the total variance of the data and avoid the misspecification problem.

Principal Components Analysis (PCA) used to analyse a number of highly correlated variables representing one or more common factor with the aim of reducing the number of variables without much loss of the information and detecting the structure of the relationships between variables. Generally speaking, principal component consider as an optimal method to explain the same amount of variance with smaller number of variables (principal components). Regarding the number of principal components that should be included in the model, both Kaiser (1960) and Scree (Cattell, 1966) tests recommend using the first principal components for each sector, namely, Banking Development Index (BDI)

and Stock market Development Index (SDI) which account for 70% and 90% from the total variation in the banking system and stock market respectively.¹⁷

To this end, two different models have been estimated to investigate the relationship and causality between finance and growth based on the previous two scenarios as follows:

$$\text{Model (1): } LY = C_1 + \alpha_1 \text{PCR} + \beta_1 \text{MTR} \quad (6.19)$$

$$\text{Model (2): } LY = C_2 + \alpha_2 \text{BDI} + \beta_2 \text{SDI} \quad (6.20)$$

Where LY is the logarithm of real GDP, C_i is constant, PCR refers to the private credit ratio and MTR represent the stock market turnover ratio in the first model, whereas the BDI and SDI denote Banking Development Index and Stock market Development Index respectively in the second model.

6.4.2 Unit Root and Stationarity Tests

The properties of the time series variables under consideration have been examined using both unit root test (ADF) and stationary test (KPSS). Where, unit root tests (ADF) examine the null hypothesis that is the time series under consideration has a unit root. It's well known that, unit root tests suffer from lack of power against the alternative of stationarity in small sample. This is because unit root tests depending on the span of the time series rather than the number of observations. In other words, it's more likely to accept the null hypothesis of unit root unless there is very powerful evidence against it. In this concern, to overcome this problem KPSS test has been employed to compliment ADF test by testing both unit root and stationary hypotheses to confirm the results.

As noted from Table 6.4, ADF results failed to reject the null hypothesis of unit root, where the absolute computed statistical values are less than the absolute asymptotic critical values for all variables in their levels. However, they become stationary at the first difference. Moreover, similar results are obtained from KPSS test where the null hypothesis of stationary is rejected in favour of the alternative for all variables at 5% significant level.

¹⁷ The most widely used method proposed by Kaiser (1960) suggests that only principal components with eigenvalues greater than one should be retained. However, The Scree test, which is a graphical method proposed by Cattell (1966) recommends plotting the obtained eigenvalues in a simple line and finding the elbow point where the decline of the eigenvalues appear to be stable to the right of the plot. In general, Kaiser Method usually retains too many principal components, while the second method, Scree test, keeps too few.

Thus, both ADF and KPSS tests confirm that all the time series variables are non-stationary in their levels, however they are stationary at the first difference (integrated of order one I(1)).

Table 6.4. Unit Root and Stationarity of Time-Series Variables

	ADF			KPSS		
	Levels	1 st Diff.	Characteristic	Levels	1 st Diff.	Characteristic
LY	-2.36	-3.71***	I(1)	0.76***	0.15	I(1)
PCR	-2.71	-3.78***	I(1)	0.48**	0.26	I(1)
MTR	-2.44	-3.90***	I(1)	0.62**	0.07	I(1)
BDI	-1.49	-4.05***	I(1)	0.66**	0.14	I(1)
SDI	-1.33	-3.66***	I(1)	0.59**	0.10	I(1)

Source: Author calculations.

Note: ***, ** indicate significance at the 1%, and 5% levels, respectively. The ADF-test critical values are -3.45 and -2.87 for the 1% and 5% significance levels, while the corresponding KPSS-test asymptotic critical values are 0.73 and 0.46.

6.4.3 Johansen Cointegration Results

Since, it has been confirmed that all variables under examination are integrated of order one using ADF unit root and KPSS stationarity tests. Thus, Johansen full information maximum likelihood procedure can be applied to test the rank of the cointegration. However, the cointegration test is very sensitive to the choice of number of lags included in the model. As a result, the appropriate lag length for the VEC model was selected at (2) based on Schwarz information criteria.

The Johansen cointegration results for the previous two models are presented in Table 6.5 which reveals the existence of one cointegrating vector among the three indicators in both models. Hence, these three variables would not move too far away from each other in the long-run. The long-run cointegrating relationship among the logarithm of real GDP and the development of both banking sector and stock market are reported in Table 6.6. It is clear from the cointegrating vectors that there is a positive association between real GDP and both banking system development and stock market development in the case of Egypt. However, these unstandardized relationships could not be used to answer the question whether banking sector and/or stock market are more conducive to economic growth in the case of Egypt?

Table 6.5. Cointegration Test Based on Johansen Approach

Null hypothesis	Alternative hypothesis	Test Statistic	5% Critical Value	Probability value
Model (1)				
Trace statistic				
$H_0: r = 0$				
	$H_1: r > 0$	30.0**	29.7	0.04
$H_0: r \leq 1$				
	$H_1: r > 1$	2.70	15.4	0.98
Maximum eigenvalue statistic				
$H_0: r = 0$				
	$H_1: r = 1$	27.2**	21.1	0.00
$H_0: r = 1$				
	$H_1: r = 2$	1.61	14.2	0.99
Model (2)				
Trace statistic				
$H_0: r = 0$				
	$H_1: r > 0$	38.5**	29.7	0.00
$H_0: r \leq 1$				
	$H_1: r > 1$	15.0	15.4	0.06
Maximum eigenvalue statistic				
$H_0: r = 0$				
	$H_1: r = 1$	23.4**	21.1	0.02
$H_0: r = 1$				
	$H_1: r = 2$	10.8	14.2	0.16

Note: ** Denotes rejection of the null hypothesis at the 5% significant level. P-values obtained from MacKinnon et al. (1999).

To this end, the standardized coefficients are estimated by multiplying the unstandardized coefficient, α_i and β_i , by the ratio of the standard deviations for the independent and dependent variables. As a result, all standardized variables would have a mean of zero and a standard deviation of one. That would make all the estimated coefficients more comparable as they are expressed in terms of the same units (standard deviations) without changing the statistical significance. Standardized coefficients are of paramount importance especially in multivariate models where the size of the impacts of different independent variables could be simply compared. It can be seen from Table 6.6 that a one standard deviation increase in banking sector results in a 0.26 and 0.07 standard deviation increase in the logarithm of real GDP according to model 1 and 2 respectively, whereas a change in the

stock market by one standard deviation would stimulate real GDP logarithm by 0.78 and 1.12 standard deviation in the long-run based on model 1 and 2 respectively. It is noteworthy that in both models the standardized coefficients of the stock market are greater than the coefficients of the banking sector. In other words, in the long-run stock market is more powerful than the banking sector in stimulating the economic growth in Egypt.

Table 6.6. The long-run Relationships and their Standardized Coefficients

The long-run cointegrating relationships			
Model (1):	$LY = 11.3 + 0.91 PCR + 1.32 MTR$		
	(0.17)	(0.10)	
Model (2):	$LY = 11.9 + 0.02 BDI + 0.28 SDI$		
	(0.05)	(0.04)	
The Standardized coefficients			
Model (1):	$LY = 0.26 PCR + 0.78 MTR$		
	(0.17)	(0.10)	
Model (2):	$LY = 0.07 BDI + 1.12 SDI$		
	(0.05)	(0.04)	

Source: Author's calculations.

6.4.4 Granger Causality based on VEC Model

Since the variables under consideration are cointegrated, the Vector Error Correction Model (VECM) including the error correction term will be calculated in order to investigate the dynamic behaviour of the variables in both short-run and long-run. The VEC model describes how the examined variables are adjusting in each time period towards its long-run equilibrium state. Furthermore, these two models passed all the diagnostic tests. Hence, there is no serial correlation, or heteroskedasticity and residuals are normally distributed.

Granger causality test on the basis of the error correction model has been used to examine the direction of causality between economic growth rate, banking system development, and stock market development in both short-run and long-run. Firstly, the short-run causality are applied by examining whether the coefficients of the lagged values of the explanatory variables are jointly significant using F-test. Secondly, the long-run causality represented by the significant of the Error Correction Term (ECT) and examined based on *t*-statistics.

Table 6.7 reports the results for Granger causality test where there is consistency in the causality pattern in the long-run but not in the short-run. Regarding causality pattern in the short-run, model one indicates the existence of unidirectional causal relationship between economic growth rate and stock market with direction from economic growth to stock market. While, model two suggests the presence of mutual causality between economic growth and banking sector.

As it comes to the causality pattern in the long-run, consistent results are obtained from both models. On the one hand, results indicate a unidirectional causality running from economic growth to both banking sector and stock market. As the error correction terms at banks and stock market equations have the correct sign and statistically significant, but insignificant at economic growth equation. Therefore, the null hypotheses of no causality have been rejected indicating that economic growth Granger cause both banking development and stock market development in the long-run.

These findings reject the supply-leading hypothesis in favour of the demand-following view that finance follows economic growth in the case of Egypt over the sample period. Furthermore, these results are consistent with the literature which emphasis the demand-following hypothesis (see for example, Chandavarkar, 1992, Gurley and Shaw, 1967, Jung, 1986, Lucas, 1988b, Stern, 1989, Romer, 1990, Odhiambo, 2004a, Liang and Teng, 2006, Zang and Kim, 2007, among others). More importantly, Kar and Pentecost (2000b) and Odhiambo (2008) examine the causal relationship between financial development and economic growth using different measures for financial development in turkey and Kenya respectively. In general, they conclude that economic growth Granger cause financial development. However, their results are sensitive to the choice of financial development indicators.

On the other hand, there is a bilateral relationship between banking sector development and stock market development. This common result seems to be interesting in terms of the financial structure literature and the on-going debate of bank-based versus market-based. In other words, this finding supports the financial services view that banks and stock market are more likely to be complementary rather than substitutes -it's not a matter of bank-based or market-based financial system, however it's the overall provision of financial services

are more crucial and significant in promoting the economic growth (Demirguc-Kunt and Levine, 1996b, Levine, 2002, Levine, 2003a, Beck and Levine, 2004b, Beck and Levine, 2002, Demirguc-Kunt and Levine, 2004, Demirguc-Kunt and Maksimovic, 2002). Banks and financial markets are different components of the financial system and provide different financial services.

Table 6.7. Granger Causality Results based on VEC Model

Model (1)			
Explanatory Variables	dLY	dPCR	dMTR
Short-run: F-statistics			
dLY	-	1.17	3.48**
dPCR	2.15	-	3.02
dMTR	1.71	2.89	-
ECT: t-statistics	-0.022	-0.075**	-0.76***
Model (2)			
Explanatory Variables	dLY	dBFI	dSDI
Short-run: F-statistics			
dLY	-	4.73**	0.19
dBFI	5.52**	-	0.58
dSDI	1.81	2.87	-
ECT: t-statistics	0.0004	-0.019***	-0.037**

Note: ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

6.5 Conclusions and Recommendations

This empirical chapter contributes to the literature by exploring the finance-growth nexus and the pattern of causality in the case of Egypt that of paramount importance for policy makers. Different proxies of financial development have been employed to investigate this relationship. In model one the private credit ratio and stock market turnover ratio have been

utilised whereas in model two the banking development index and stock market development index were constructed using principal component analysis and employed in VECM framework.

Results for unit root and stationarity tests indicate that all variables are found to be non-stationary at their levels but stationary at the 1st differences. In other words, cointegrated of order one. Moreover, empirical results from cointegration test show the variables under consideration are cointegrated where there is one cointegrating relationship among the logarithm of real GDP and indicators of financial development. The long-run cointegrating vectors under these two models pointed out that the development of stock market is more conducive to higher growth rate than banking sector in the case of Egypt. This finding is in line with Bolbol et al. (2005). He pointed out that market-based measures have a more pronounced influence on TFP growth than the bank-based indicators in the case of Egypt.

Additionally, this empirical chapter considers the Causality pattern which has been examined based on Vector Error Correction Model (VECM) in both the short-run and the long-run. Two competing hypotheses are empirically tested regarding the causal relationship between financial development and economic growth, namely the supply-leading and demand-following hypotheses. While the causality pattern in the long-run are consistent and support the demand-following view that economic growth promotes higher financial development, the causality pattern in the short-run provide mixed results. These results are consistent with findings from some developing countries where less-developed economies with less sophisticated and under developed financial systems tend to provide evidences in favour of demand-following view.

Although, the empirical analyses indicate that the causality between financial development and economic growth in Egypt is very sensitive to the way that the financial development is measured the demand-following pattern tends to be more predominant. Kar et al. (2011) show that the direction of causality between financial development and economic growth is sensitive to the choice of financial development indicator in the MENA countries. Thus, the direction of causality seems to be country and financial development indicator specific (Ang, 2008, Demirguc-Kunt and Levine, 2008). Indeed, the empirical results from various empirical studies at different levels, country group and/or specific country study, using

several econometric techniques are ambiguous and vary considerably according to the choice of financial development variables, function form, estimation method and data frequency (Khan and Senhadji, 2003, Odhiambo, 2008, Kar and Pentecost, 2000b).

Additionally, the causality pattern shows a bilateral relationship between banking sector development and stock market development. This common result seems to be interesting in terms of the financial structure literature and the on-going debate of bank-based versus market-based. In other words, this finding supports the financial services view that banks and stock market are more likely to be complementary rather than substitutes -it's not a matter of bank-based or market-based financial system, however it's the overall provision of financial services are more crucial and significant in promoting the economic growth (Demirguc-Kunt and Levine, 1996b, Levine, 2002, Levine, 2003a, Beck and Levine, 2004b, Beck and Levine, 2002, Demirguc-Kunt and Levine, 2004, Demirguc-Kunt and Maksimovic, 2002).

Even though, the Egyptian financial system has experienced an extensive reform since the early 1990s, there still a lack of well-developed financial institutions that provide a wide range of financial instruments that are more sophisticated and allow a high degree of diversifications. Furthermore, the small and medium enterprises (SMEs) were purely blocked from getting sufficient credit from banks due to the lack of credit history and difficulties that banks face in identify the creditworthy SMEs in developing countries. In the meantime, financial markets are concentrated and dominated by large corporations and business elite who can get more benefits from the financial sector.

Thus, on the one hand the government should adopt comprehensive regulatory changes that aim at enhancing the financial sector, provide robust institutional framework and encourage more sophisticated financial instruments with high diversifications leading to higher investment and economic growth. On the other hand, more prudential regulations and supervision are needed in order to ensure economic agents have full access to both banks and financial markets, in particular, small and medium firms.

7 Financial Liberalisation and McKinnon's Complementary Hypothesis: An Empirical Evaluation for Egypt

7.1 Introduction

According to financial liberalisation literatures, financial development was connected and related to the financial repression. This is on the basis that financial liberalisation or the removal of financial repression can be one way by which the financial sector can develop and affect the rate of economic growth. Thereby, following on the results from chapter 6, this chapter extends the analysis of finance and growth nexus by assessing, in the case of Egypt, the financial liberalization hypothesis from different perspectives. This chapter focused on the financial regulations and policies which were followed through the implementation of Economy Reform and the Structural Adaptation Program (ERSAP) prescribed by the World Bank and the International Monetary Fund. Furthermore, this chapter empirically investigates the long-run and short-run association between financial liberalisation; financial development; interest rate behaviour; and savings and investment.

A convincing theoretical framework for financial liberalization hypothesis was lacking until the publications of McKinnon (1973) and Shaw (1973), where a concrete theoretical framework to the link between financial liberalization and economic growth was provided. According to which higher interest rates resulted from financial liberalization policies will induce households to increase their savings, which from one hand encourage and boost financial intermediation process and on the other hand, accelerate the supply of loanable fund available to the private sector. This, in turn, has a positive impact on the level of investment, allocation efficiency of capital resources and hence economic growth. Indeed, McKinnon's analysis is based on a complementary relationship between real money and physical capital accumulation where money is treated as holding asset related to the financing expenditure.

On this basis, Egypt, like many other developing countries, implemented an extensive wave of economic reforms and, in particular, financial sector liberalisation with the expectation that, through promoting savings and investment, financial liberalisation policies would

enhance the economic growth. In order to achieve rapid growth, the Egyptian government embarked on continuous financial development and liberalisation programmes which the World Bank (WB) and International Monetary Fund (IMF) prescribed at the onset of the 1990s. However, the validity of McKinnon's complementary hypothesis and the extent to which financial liberalisation and financial development affect the economic growth has been an issue during the past few decades.

Therefore, this empirical chapter is related to the literature on policy effecting growth and has three-fold objectives. Firstly, review the empirical literature on McKinnon's hypothesis and in particular the effects of financial liberalisation and interest rate behaviour on savings, investment and economic growth. Secondly, outline the theoretical foundation of McKinnon's complementary model and financial liberalisation hypothesis. Finally, assess empirically the validity of the complementary hypothesis and hence the impact of financial liberalisation policies on savings, investment and economic performance in the case of Egypt.

Thus, this chapter investigates the long-run and short-run association among real interest rate behaviour, financial liberalization index, savings and investment in Egypt using annual time series data during the period 1980-2011. To this end, the Bounds cointegration test and Auto Regressive Distributed Lag model (ARDL) are applied to investigate McKinnon's complementary hypothesis and examine the long-run co-integration relationship between variables under consideration. Moreover, ADF and KPSS have been utilised to test the integration order of the variables.

For the best of our knowledge, there is no previous empirical study has attempted to investigate and assess the validity of McKinnon's complementary hypothesis for Egypt. Therefore, this empirical chapter tend to fill the gap and contribute to the literature by examining the validity of McKinnon's complementary hypothesis and the link between financial liberalization and economic growth rate in the context of Egypt with the most recent available dataset and accurate measure for financial liberalization process based on principal component analysis in multivariate time series model. Furthermore, channels through which financial liberalisation affecting economic growth rate will be examined, namely the effect of financial liberalization on savings and investment ratios.

This chapter is organised as follows. Section 7.2 reviews the empirical literature on financial liberalisation and McKinnon's complementary hypothesis. Section 7.3 shows variables constructions and data sources, while section 7.4 presents model specification. Section 7.5 illustrates the theoretical background and foundation of the econometric methodology used in this chapter. Section 7.6 relates the empirical results of McKinnon's model and how financial liberalization would affect savings and investment, while concluding remarks and policy implications discussed in the last section.

7.2 Empirical Literature Review

7.2.1 Financial Liberalisation Literature Review

The topic of financial liberalization has received a great attention during the last four decades, where a large number of developing countries had adopted different types of financial liberalization policies and programmes. Particularly emerging market economies, where financial liberalization policies as a part of extensive structural programs were implemented with the encouragement of the WB and IMF.

In line with the beliefs of McKinnon (1973) and Shaw (1973), developing countries and in particular MENA region economies have implemented and undertaken a wave of financial policies and adopt several financial liberalization regime in their domestic financial system (Ben Naceur et al., 2008).¹⁸ With the belief that, higher levels of interest rates through financial liberalization policies would lead to more efficient allocation of capital and increase the available loanable funds via increasing household's savings and deposits at the financial system. This in turn increase investment and foster the economic growth.

Nevertheless, the financial liberalization hypothesis has been the subject of on-going debate by both academic researchers and policymakers, particularly regarding the effects and sequences of financial liberalization policies on macroeconomic performance, in particular, savings, investment and economic growth rate. Thus, two opposing views exist in the financial liberalisation-growth literature.

¹⁸ Bahrain, Iran, Israel, Kuwait, Lebanon, Egypt, Jordan, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey, UAE.

The proponents of financial liberalization argue that improving competition in the financial markets, cut the information and transaction costs of converting illiquid assets to liquid assets, and ease the liquidity constraints faced by investors brought by financial liberalization policies have a positive impact on investment, capital accumulation efficiency and hence economic growth rate (see i. e., Bekaert, 1995, Bekaert et al., 2005, Fowowe, 2008a, Henry, 2003, Hübler et al., 2008, Levine, 2001, Tswamuno et al., 2007, among others).

For example, Obstfeld (1994a) emphases the importance of risk-sharing through greater financial liberalisation and market integration. This allows individual to invest in high risk, high return, long-run domestic and international projects conducive to greater capital accumulation and allocation efficiency. Furthermore, Levine (1996a) indicates that financial liberalization improves the efficiency of capital resource allocation and boosts savings. This, in turn, stimulates economic growth by increasing the competition in the financial markets, provide financial services with high quality and lower cost and enhance the quality and the flow of information between economic agents.

Along the same line, Sauve (1999) argues that financial liberalisation programmes have three key advantages for the developing countries. Firstly, financial liberalisation gives more chances to foreign private sector and entrepreneurs to undertake investment in the domestic economy which increase the level of savings-investment and contribute positively to higher growth rate. Secondly, the intervention of foreign banks and financial institutions in the domestic financial sector would enhance the institutional framework by offering advanced credit analysis techniques, enhance the quality of the financial services and reduce financial instability. Finally, financial innovation, advanced technologies and domestic financial sector modernisation brought about by financial reform programme would enhance the quality and quantity of investment leading to higher growth rate.

Moreover, a higher level of competition at the financial markets would enhance financial services efficiency through pricing competition in the banking sector which decrease interest rate spread and lower the cost of borrowing capital. This, in turn, affects positively investment and growth. “Competitive pressures will raise the functional efficiency of intermediation by decreasing the spread between deposit and lending rates” (Gibson and

Tsakalotos, 1994, P. 615). On the other hand, some economists (Such as; Arestis et al., 2003a, Demirgut-Kunt and Detragiache, 1998, Zaidi, 2006, among others) indicate that financial liberalization programmes have been at the root of financial markets volatility, financial system destabilization and banking crises in many countries which deter capital accumulation process and economic growth, particularly, during the initial phases of financial liberalization programs. Indeed, financial liberalization and reform program exposure the domestic economy to several types of risks includes high inflation rates, trade account deficit through appreciation of domestic currency, macroeconomic volatility and financial instability through capital flows and capital account liberalization, financial fragility and later sequences of financial crisisetc (see; Kose et al., 2003, Prasad et al., 2004, Kose et al., 2009, Rousseau and Wachtel, 2011). Hence, financial liberalization remains the hot topic of theoretical and empirical studies.

Other studies pointed out that increased competition brought about by financial liberalization could harm investment and the economic growth rate by increasing volatility and fragility in the domestic financial sector (Hellmann et al., 2000). On the one hand, high real interest rates are correlated with excessive risk taking and systemic financial crises (Demirguc-Kunt and Detragiache, 1998). On the other hand, financial liberalization program could be coupled with remarkable capital outflows and inefficient credit policies by the banking sector which increase non-performing loans (NPL) and affecting capital allocation and economic growth adversely. Zaidi (2006) indicates that increasing competition in the financial markets in Philippines by removing entry barriers for domestic and foreign banks during 1996 encourages financial institutions proliferation. This, in turn, leads to unbalanced portfolios and accumulates non-performing loans at the banking sector. Bekaert et al. (2005) found that financial liberalisation has a positive impact on investment and economic growth rate using an extensive data set for 95 countries during the period 1980-1997 and generalized method of moments (GMM), where financial liberalisation policies conducive to 1% increase in real GDP per capita growth rate on average per annum. Achy (2005) empirically investigated the relationship between financial liberalisation program, private investment and economic growth in MENA countries including Egypt

during the period 1970-1998.¹⁹ In contrast to Bekaert, the results indicate that financial liberalisation policies affecting adversely private investment and hence the economic growth rate through the expansion of mortgage and consumer credit markets and private credit misallocation in favour of households rather than loans to firms and businesses.

In addition, Ben Naceur et al. (2008) using data for 11 MENA countries include Egypt during the period 1979-2005 indicate that financial liberalisation policies, particularly stock market liberalisation, have no effects on investment and economic growth rate in the long-run. Furthermore, their results ascertain the importance of financial liberalisation sequencing, that is, financial liberalisation should be implemented domestically before fully liberalising the capital account and open domestic markets to foreign investors. These financial reform sequences will give an opportunity for developing economies to develop and fully adjust their financial and production sectors in the way that is consistent with their comparative advantages and achieve capital resources allocation efficiencies. If financial liberalization cannot be done correctly and perfectly, it would raise major problems inside the economy, such as financial fragility, instability and financial crises. Specially, in countries like Egypt which experiencing structural transformations towards the free market economy.

7.2.2 McKinnon's Complementary Hypothesis Literature Review

There is considerable debate regarding the validity of McKinnon's complementary hypothesis in the literature, while some empirical results provide strong evidence in favour of McKinnon's complementary hypothesis, others provide a contradictory or inconclusive findings. Empirical studies, which investigate McKinnon's complementary hypothesis, have adopted different model specifications and estimation approaches in order to assess the legitimacy and accuracy of the hypothesis in developing countries. Some economists estimate real money balances and investment model (see i.e., Ashfaque H. Khan and Lubna Hasan, 1998, Moore, 2010, Pentecost and Moore, 2006, among others), while others used real money balances and savings functions (see i.e., Ashfaque H. Khan and

¹⁹ The sample includes five MENA countries, namely Egypt, Jordan, Morocco, Tunisia, and Turkey.

Lubna Hasan, 1998, Kargbo, 2010, Odhiambo, 2005, Ogwumike and Ikenna Ofoegbu, 2012, among others).

Empirical case studies, such as Thornton (1990) employs Ordinary Least Square (OLS) and two-stage least squares (2SLS) econometric methods in order to assess the validity of the complementarity relationship between money and capital accumulation during the period 1964-1984. Empirical findings confirm the validity of the hypothesis in India, where the coefficients of both real money balances and savings ratio were positive and statistically significant at the savings and real money balances models respectively. At the meantime, Laumas (1990) evaluates the impact of financial liberalisation and, in particular, the complementary hypothesis by estimating both real money balances and investment models using 2SLS estimation during the period from 1954/55 to 1974/75. Once more, results support the complementarity relationship between money and physical capital. Similarly, Pentecost and Moore (2006) estimate the demand for real money balances and investment functions simultaneously using Johansen cointegration approach and Vector Error correction Model (VECM) over the period 1951-1999. Their results demonstrate a positive correlation between real return on capital and real money balances which support the complementary hypothesis for India.

For the case of Turkey, Kar and Pentecost (2001) employ the Johansen cointegration method alongside vector error correction models (VECM) to examine the complementary hypothesis for Turkey during 1980-1995, using the demand for money and investment functions. The positive and significant long-run coefficients of real money balances and investment ratio support the complementary hypothesis by McKinnon, that is financial liberalisation would increase money balances accumulation and as a result greater availability of loanable funds for physical capital. In contrast, ÖZER (2003) using real money balances and investment functions to test the complementary hypothesis based on time series analysis and Johansen cointegration test during the period 1980-1999 indicates that McKinnon hypothesis does not hold for Turkey. Contrary to McKinnon, the cost of capital is the main constraint for physical capital accumulation rather than the availability of loanable fund in developing countries.

Additionally, Odhiambo (2004b) investigates McKinnon complementary relationship in Kenya using cointegration and Error Correction Model (ECM) in two different specifications. On the one hand, real money balances and investment functions, and on the other hand real money balances and saving functions. His results provide vigorous support to the complementary hypothesis by McKinnon. By contrast, Mwega et al. (1990) investigate the complementary relationship between money and capital accumulation for Kenya by estimating real money balances and private saving functions during the period 1966-1985 using OLS. Findings did not give any evidence that support the complementary hypothesis, in contrast real rate of deposits have insignificant impact on private savings rate and real money balances.

In Nigeria, on the one hand, Ajewole (1989) examines the validity of McKinnon's complementary hypothesis using OLS econometric approach. Results provide strong evidence in favour of the complementary relationship between money and capital accumulation where real return on physical capital has a positive and significant impact on real money balances. On the other hand, Okpara (2010) and Ogwumike and Ikenna Ofoegbu (2012) indicate that financial liberalisation has a detrimental effects on savings and investment in the long-run in the case of Nigeria and as a result conclude that McKinnon's complementary hypothesis seems not to be valid in the developing countries.

For Nepal, using two-stage least squares (2SLS) econometric approach, Thornton and Poudyal (1990) examine the complementary hypothesis by estimating real money balances and savings models during the period 1974/75-1986/87. Their findings provide robust evidence in favour of McKinnon complementary hypothesis. Similar results have been reported by Khan and Lubna (1998) for Pakistan where two different specification were estimated based on cointegration and Error Correction Model to examine McKinnon's complementary hypothesis for the period 1959/60-1994/95, that is, real money balances and investment ratio on the one hand, and real money balances and savings ratio on the other hand. The results of the study provide ample support in favour of McKinnon's hypothesis in both specifications whether in long or short-run formulations.

Moreover, Gounder (2007) investigates the complementary hypothesis between money and capital accumulation for Fiji using real money balances and savings models along with

ARDL cointegration technique. Results were partially consistent with McKinnon's hypothesis, while the parameter of real money balances is positive and statistically significant in the savings model, the parameter of the savings ratio is positive and insignificant in the real money balances model. On the other hand, Baliamoune (2006) tests the relationship between financial liberalisation, real interest rate and private savings ratio in the case of Morocco during the period 1960-1999 using vector error-correction model. Results indicate a negative long-run impact of financial reform and in particular real interest rates on private savings ratio.

Correspondingly, empirical studies based on panel estimation provide conflicting results as well regarding the validity of McKinnon's hypothesis. Fry (1978) using 2SLS and pooled time series technique with annual data for 10 Asian countries indicates that savings has a negative and statistically impact on real money balances which contradict McKinnon proposition. He argues that this finding might be as a result of the sample where "Asian LDCs used in this analysis have achieved stages of financial development well beyond the phase in which the complementarity assumptions might hold. These LDCs have highly sophisticated indigenous, noninstitutional as well as modern institutional financial system" (Fry, 1978, P. 474).

Similar results were obtained by Jappelli and Pagano (1994) who investigated the relationship between liquidity constraints, savings rate and productivity growth for OECD countries using overlapping-generations model and panel data during 1960-1987. Results show that liquidity constraints on households have a positive impact on savings and productivity growth rate. While, financial liberalisation that takes place during 1980s has negative effects on national savings and economic growth.

Furthermore, Moore (2010) investigates the McKinnon's complementary hypothesis, that the demand for money and physical capital formation are complementary in developing countries due to self-financed investment motive. He estimated real money balances and investment models using panel cointegration and instrumental variables techniques for 107 developing countries during the period from 1970 to 2006. His study provides mixed results, while the low-income group countries support the complementary hypothesis by McKinnon and reveal that, real rate of deposit has a positive impact on the demand for real

money and investment ratio. This, in turn, affects positively the supply of credit and stimulate the physical capital formation, “complementarity is not supported in the middle income group of countries, nor when a country reaches a certain stage of financial market development” (Moore, 2010, P. 266).

To conclude, empirical literature including case studies and time series analysis on the one hand and cross-section and panel studies on the other hand, provide conflicting views regarding the validity of McKinnon’s complementary hypothesis and the effect of financial liberalisation on savings, investment and capital accumulation process in developing countries; whether money and physical capital accumulation are complements or substitutes.

7.3 Data and Variables

Data for the empirical analysis have been collected from various sources, such as; World Development Indicators (WDI), International Financial Statistics (IFS), Egyptian Capital Market Authority (ECMA), and Arab Monetary Fund (AMF). The sample covers the period from 1980 to 2011. Furthermore, financial liberalisation and development indices have been constructed by the author using Principal Components Analysis (PCA), for the list of variables, definitions and data sources that have been used in empirical analysis see Table 7.2.

7.3.1 Financial Liberalization Index

According to the literature, financial liberalization can be defined as “a set of operational reforms and policy measures designed to deregulate and transform the financial system and its structure with the view to achieving a liberalized market-oriented system within an appropriate regulatory framework”(Chaudhry, 2007, P. 2). Hence, financial liberalization would stimulate the economic growth rate by improving savings/investment (level effect) and the efficiency of capital resources allocations (reallocation effect). Thus, financial market development is not only a function of financial liberalisation policies that takes into account merely monetary aggregates liberalisation, but rather a consistent macroeconomic policy set including a variety of dimensions, such as liberalising interest rates along with comprehensive financial markets supervision aimed at closely monitoring financial

institutions in order to avoid moral hazard and adverse selection problems (For more information see, Galbis, 1993, Hanson, 1985, Kapur, 1992).

Researchers have regularly experienced the problem of assessing empirically the degree and the intensity of financial liberalization programmes. This problem is very critical, as many countries, even advanced economies that have well-developed financial markets and adopt the free market mechanisms, have maintained various financial controls with different degrees of intensities at different periods, which apparently have different impacts on savings, investment and hence economic growth rate.

The majority of studies which investigate the effects of financial liberalization reforms have relied primarily on a dummy variable to reflect various measures of financial liberalization reforms. Using simple dummies, such as a binary variable which take the value of 0 and 1 based on the official date at which financial liberalization policies take place declared by International Monetary Fund reports, are inaccurate. As financial liberalization reform programmes primarily involve several measures implemented over a number of stages during several years or longer period as the financial repression controls has never been relaxed contemporaneous. These reform procedures include: strengthening of financial market competition through removing entry barriers for domestic and foreign banks, nominal interest rates liberalisation (both deposit and lending rates), reduction or abolition of reserve requirements, credit controls elimination (credit ceilings and directed credit program), state-owned banks privatization, prudential regulations improvements (such as, central bank independence), stock market development, and capital account openness. Therefore, it is not appropriate to measure the financial liberalization policies using a dummy variable based on a single date at which one element of the financial liberalization program has taken place and ignore the effect of other dimensions of the financial reforms.

As a result, researchers have made a lot of efforts to avoid this problem by constructing financial liberalization index. To this end, following Bandiera et al. (2000), Laeven (2003) and Fowowe (2008b), a financial liberalization index has been constructed that takes into account changes in eight key dimensions of financial liberalization reforms, that is, interest rates liberalization, reserve requirements abolition, eliminate directed credit programme, banks privatization and restructuring, prudential regulations, stock market development,

capital account liberalisation, and pro-competition policies. Firstly, different sources have been reviewed to identify and record changes in financial liberalization policies and gather information on dates and sequences of financial liberalization measures implemented in Egypt, for instance; International Monetary Fund (IMF) reports for Egypt and the Central Bank of Egypt (CBE) reports, Achy (2005), Arestis (2003), and Ikram (2009). Secondly, eight dummy variables have been introduced to reflect each dimension of financial liberalisation regime, which takes the value of 1 during the period at which a financial liberalization measure was implemented and 0 otherwise (see Table 7.1). Afterwards, instead of including all these dummy variables at the econometric model which will consume many degrees of freedom and expose the model to the multicollinearity problem, Principal Component Analysis (PCA) has been applied to extract the first principal component which is weighted average of the dummy variables.

Principal Component Analysis (PCA) is extremely useful in extracting the fundamental relationships between the underlying variables and in the meantime minimising the dimensions of the data set. Furthermore, the principal components technique allows for a large number of correlated variables to be employed at the model, where a number of uncorrelated principal components are extracted and constructed as a weighted linear combination of the original variables. The principal components are ordered ascending so that the first principal component accounts for the largest variation in the original data set. Whereas, the second principal component is entirely uncorrelated with the first component, and explains the maximum variation that is not expressed at the first principal component.

Table 7.1 shows the timing, sequences and progress that have been made with respect to each financial liberalisation measure that were applied during the period of financial liberalisation regime. Furthermore, financial liberalization dummy variables are actually effective one lagged period after being implemented, so that the affects depends upon the lagged value of the financial liberalisation measures rather than the contemporaneous values.²⁰

²⁰ For further details about dates and sequences of financial liberalization program in Egypt, see table (5.1) in chapter five.

Table 7.1. Financial Liberalisation Dummy Variables

7.3.2 Financial Development Index

A vast body of empirical studies have reported the positive impact of financial development on savings, investment and economic growth (see i.e., Ben Naceur et al., 2008, Demetriades and Luintel, 1996, Fry, 1995, Goldsmith, 1969, Levine, 2002, McKinnon, 1973, Shaw, 1973, among others). As a result, a proxy for financial development should be included in the model to avoid the problem of biased estimations due to omitted relevant variables.

Several proxies for the financial development have been employed in order to reflect the overall size and activities of the formal financial intermediaries (banking sector) based on the assumption that financial depth indicators relative to the economic activities (measured by the GDP) are good predictors for the quantity and the quality of the financial services provided by the banking sector. To this end, three measures have been employed to reflect different dimensions of banking sector development, namely, liquid liabilities to GDP ratio, the ratio of private credit to GDP and the ratio of deposit money bank assets to total financial assets (deposit money bank plus central bank assets). Moreover, the financial liberalisation programme implemented in Egypt have several dimensions, one key element of the financial reform is stock market liberalisation. Thereby, following Beck et al. (1999) three key indicators for stock market development are taken into consideration which reflect size, activities and turnover of the stock market, namely, the ratio of market capitalization, total value traded ratio and turnover ratio.²¹ Thereby, the Financial Development Index is represented by the first principal components of the previous six variables using Principal Component Analysis (PCA).

7.3.3 Control Variables

To avoid the problem of omitted variables biased in the models and effectively capture the impact of financial liberalisation on real money balances, investment, savings and hence economic growth, several control variables have been included at the empirical models that have been identified in the literature and reflects different macroeconomic policy-related, such as; financial liberalisation, financial development, public

²¹ For further details regarding the constructions and measures of financial development see section (6.3.1) in chapter six.

investment ratio, public savings ratio, external debt ratio, dependency ratio, inflation rate to control for the uncertainty and macroeconomic stability and trade openness measured as exports plus imports relative to GDP to control for trade liberalisation effects, see table (7.2) for list of variables used, their constructions and data sources.

Table 7.2. List of Variables, Definitions and Data Sources

Variables	Definition	Data Source
Real Income	Real Gross Domestic Product	WDI
Real Money Balances	Obtained by deflating money and quasi money (M_2) by the GDP deflator.	WDI and Author Calculations
Real Interest Rate	Measured as deposit rate minus inflation rate.	WDI and Author Calculations
Private Savings Ratio (involve households and corporations savings)	Estimated as domestic savings minus public savings to GDP	WDI and Author Calculations
Public Savings Ratio	Budget deficit to GDP	WDI
Private Investment	Total expenditures on additions to fixed domestic assets by the private sector	Ministry of Planning, Egypt (http://www.mop.gov.eg/english/Economic%20Indicators.html).
Public Investment	Total additions to the domestic stocks of fixed assets at current prices by government units and non-financial public enterprises.	Ministry of Planning, Egypt (http://www.mop.gov.eg/english/Economic%20Indicators.html).
Inflation Rate	The annual growth rate of GDP deflator over one year period	WDI
Trade openness	Exports plus imports relative to GDP	WDI
External Debt Ratio	The total external long and short-run debt by public and private sectors to gross national income.	WDI
Dependency Ratio	the ratio of young and old population (under 15 and over 60 years) to the total population at the working age	WDI
liquid Liability Ratio (LLR)	Equal the ratio of liquid liabilities of deposit money banks (M_2 – currency in circulation) to GDP	IFS and Author Calculations
Private Credit Ratio (PCR)	Measured by the credit to private sector over GDP	IFS and Author Calculations
Deposit Bank Assets Ratio (DBAR)	the ratio of deposit money bank assets to the total assets of deposit money bank plus central bank	IFS and Author Calculations
Stock Market Capitalisation (SMC)	Total value of listed shares at the market relative to the GDP	ECMA and AMF
Market Total Value Traded (MTVT)	Total value of shares traded at the market as a percentage of GDP	ECMA and AMF
Stock Market Turnover (SMT)	Total value of shares traded relative to market capitalization	ECMA and AMF
Financial development index (FDI)	An index reflecting the first principal component of financial development variables (LLR, PCR, DBAR, SMC, MVT, SMT)	Author Calculations
Financial Liberalisation Index (FLI)	An index indicates the progress that have been made with respect to the financial liberalisation programme	Author Calculations

Source: World Development Indicators (WDI), International Financial Statistics (IFS), Egyptian Ministry of Planning, Egyptian Capital Market Authority (ECMA), and Arab Monetary Fund (AMF).

7.4 Model Specification

Some economists (see i.e., Ashfaque H. Khan and Lubna Hasan, 1998, Moore, 2010, Pentecost and Moore, 2006, among others) test the validity of McKinnon's complementary hypothesis by investigating the relationship between real money balances and investment (specification one), while others (see i.e., Ashfaque H. Khan and Lubna Hasan, 1998, Kargbo, 2010, Odhiambo, 2005, Ogwumike and Ikenna Ofoegbu, 2012, among others) examine the relationship between real money balances and savings based on McKinnon's assumption that saving and investment are always identical (specification two). Consequently, for robustness and sensitivity analysis of the empirical results both specifications will be used to test the validity of McKinnon's hypothesis in the case of Egypt.

7.4.1 Specification One: Real Money Balances and Investment

McKinnon's complementary hypothesis has two dimensions.²² Firstly, the demand function for real money balances that could be written as follows:

$$\frac{M_d}{P} = F \left(Y, \frac{I}{Y}, R \right) \quad F_Y, F_{\frac{I}{Y}}, F_R > 0 \quad (7.1)$$

Secondly, the investment function that could be presented as follows:

$$\frac{I}{Y} = L(r, R) \quad L_r > 0, L_R > 0 \quad (7.2)$$

Hence, the complementary hypothesis holds true if:

$$F_I > 0 \text{ and } L_R > 0$$

7.4.1.1 The Augmented Investment Model

According to McKinnon's complementary hypothesis, in less developed economies it is not the cost of capital but rather the availability of loanable fund which is the main constraint for investment. One fundamental critique of the McKinnon's hypothesis is that there is no intermediation role between savings and credit creation by the financial institutions which is rarely to happen even in less developed countries with underdeveloped financial sector. Furthermore, real rate of deposits indirectly impact investment not only through the volume of savings (self-finance), but also the credit

²² For detailed discussion regarding McKinnon's complementary hypothesis see section (2.6.1) in chapter two.

creation provided by the financial institutions, where the supply of credit is positively correlated with the demand for money (Fry, 1980). In addition, credit creation process “contains at least two types of information about the process of financial intermediation. First, changes in credit may reflect an inability of financial intermediaries to make loans perhaps due to changes in monetary policy... leading to lower levels of investment. Second, changes in credit may reflect shocks to the intermediation system itself. Financial deregulation, financial innovations... have implications for economic activity that may be transmitted through changes in the quantity of credit” (Mallick and Moore, 2008, P. 146). Therefore, two channels could be identified, savings (self-finance) represented by the real deposit rate and credit provided by financial sector through which investment could be financed. Thus, the availability of loanable fund (credit) provided by the financial sector should be incorporated in the investment model since its impact the investment ratio along with self-finance motive for holding money (Moore, 2010). Moreover, the real return on physical capital is empirically difficult to be estimated and as a result proxied by the investment ratio, (I/Y), (Laumas, 1990, McKinnon, 1973, Moore, 2010, Pentecost and Moore, 2006). Hence investment equation could be rewritten as follows:

$$\frac{I}{Y} = L \left(C_P, \frac{I}{Y}, R, v \right) \quad L_{C_P} > 0, L_R > 0 \quad (7.3)$$

Where C_P is the ratio of private credit to GDP. Finally, McKinnon's model postulated a closed economy along with little role for the government. However, in reality many developing countries depend on foreign trade, in addition government plays central role within the economy and has different policies which affecting capital accumulation. As a result, the demand for real money balances and investment equations have been augmented with a vector of control variables(v), such as financial development and financial liberalisation indices in order to relax these restrictions and reflect the reality. Some empirical studies (see for example; James, 2005, Dekle and Pradhan, 1999, Arrau et al., 1995) stress the importance of including financial liberalisation and development as control variables in the model.²³ Moreover, (I_G) is included in the investment model

²³ Control variables that have been included in the augmented investment function are inflation rate, public investment ratio, and financial liberalisation and development indices. Thereafter, general to specific approach have been applied to attain the parsimonious model.

as control variable to account for the substitutional effect of the public sector investment. Hence the augmented model can be written as follows:

$$LM = \alpha_0 + \alpha_1 LY + \alpha_2 I + \alpha_3 R + \alpha_4 FLI + \alpha_5 FDI \quad (7.4)$$

$$I = \beta_0 + \beta_1 C_P + \beta_2 R + \beta_3 FLI + \beta_4 FDI + \beta_5 I_G \quad (7.5)$$

Where LM, LY, I, R, FLI, and FDI indicate the flow of real money balances (M2) logarithm, the real GDP logarithm, total investment ratio, real deposit rate, financial liberalization index, and financial development index. While C_P and I_G represent the private credit ratio and the public investment ratio respectively. Since, real money balances and gross domestic product have been expressed in natural logarithm forms, their estimated coefficients represent elasticity, whereas the estimated coefficients of investment ratio, real deposit rate, financial liberalisation index and financial development index demonstrate semi-elasticity.

7.4.2 Specification Two: Real Money Balances and Savings

McKinnon, in line with Neo-Classical Theory, argues that ending financial repression and moving towards financial liberalization will ease financial constraint and improve the financial intermediation process which positively and significantly affects domestic savings, investment and economic growth rates. In other words, saving and investment should be identical ($S = I$), whereas the causality direction runs from savings to investment and capital accumulation. Hence, total savings ratio $\frac{S}{Y}$ could be substituted for total investment ratio $\frac{I}{Y}$ in the demand for real money balances function as follows:

$$\frac{M_d}{P} = F \left(Y, \frac{S}{Y}, R \right) \quad (7.6)$$

Since the demand for real money balances can be expressed as a function of savings, and on the other hand, the condition of real money balances affecting savings/investment decisions. Hence, the complementary relationship is reversible and works at both ways. Consequently, following the literature (See i.e., Ashfaque H. Khan and Lubna Hasan, 1998, Fry, 1978, Gounder, 2007, Odhiambo, 2004b, Odhiambo, 2005, Thornton and Poudyal, 1990, Kargbo, 2010) the savings function could be specified as follows:

$$\frac{S}{Y} = U \left(Y, \frac{M_d}{P}, R \right) \quad (7.7)$$

Furthermore, Fry (1978) pointed out that developing countries enjoy plenty of investment opportunities, however at the mean time they suffer from lower rate of capital accumulation as a result of inadequate supply of savings. Since, savings and investment are identical and perfect substitution, higher savings would increase the demand for real money balances and vice versa, accordingly the complementary hypothesis holds true if:

$$\frac{F_S}{\bar{Y}} > 0, \frac{U_{M_d}}{\bar{P}} > 0$$

7.4.2.1 The Augmented Savings Model

The savings function has been augmented with determinants of domestic savings such as income, demographic, financial development, uncertainty and government policy in order to avoid any bias that could resulted from omitting relevant variables (Matur et al., 2012, Van Rijckeghem, 2010).²⁴ Following the standard literature, the augmented McKinnon's model can be specified as:

$$LM = \alpha_0 + \alpha_1 LY + \alpha_2 S + \alpha_3 R + \alpha_4 FLI + \alpha_5 FDI \quad (7.8)$$

$$S = \beta_0 + \beta_1 LY + \beta_2 LM + \beta_3 R + \beta_4 FLI + \beta_5 ED + \beta_6 S_G \quad (7.9)$$

Where S, ED and S_G indicate the domestic savings ratio, external debt ratio and public saving ratio. Finally, economists (see i.e., Achy, 2005, Ashfaque H. Khan and Lubna Hasan, 1998, Fry, 1978, Hermes, 2005, Rauf and Shah, 2010, among others) indicate that the most appropriate variables for testing McKinnon's complementary hypothesis would be the private savings ratio and private investment ratio rather than total savings ratio and total investment ratio. To this end, two different models have been utilised in each specification to investigate McKinnon's hypothesis. The first model employs total savings ratio or total investment ratio, whereas the second model includes private savings ratio or private investment ratio for testing the sensitivity and robustness of the results. However, data about private savings is not available for Egypt. The World Bank reports savings data for Egypt in terms of total domestic savings, where domestic savings involves private and public savings. Hence, following Ang

²⁴ Control variables that have been included in the augmented savings function are GDP growth rate, financial liberalisation and development indices, inflation, public saving ratio, dependency ratio, external debt ratio. Thereafter, general to specific approach have been applied to attain the parsimonious model.

(2011) and Rauf and Shah (2010) private savings is measured as domestic savings minus public saving.²⁵

7.5 Econometric Methodology and Asymmetric ARDL Model

It is common in time series analysis that the regressors included in the model may affect the dependant variable with a time lag. Meanwhile, the regressand might be correlated with the lagged observation of itself which leading to estimation biased and invalid references. As a result, these considerations inspire applying Autoregressive Distributed Lag model of order p and q (ARDL(p,q)) which includes lagged values of the dependent variable-P and the distributed lags effect of the explanatory variables-q. Furthermore, financial liberalisation may have both short and long-run implications for savings, investment, capital resources allocation efficiency and hence the economic growth rate. Therefore, it is of great importance to apply a modelling approach that allows information for both short and long-run relationships simultaneously, such as the ARDL approach.

7.5.1 Advantage of the ARDL Approach

Recently, the ARDL approach has gained popularity for a number of reasons that could be considered as ARDL approach advantages over other cointegration techniques:

- Autoregressive distributed lags (ARDL) model the dynamic relationship between variables using lagged values of the dependent variable (AR) and distributed lag effect of the explanatory variables (DL). Hence, it takes account of serial correlation and endogeneity problems by including a sufficient number of lagged values of both dependent and independent variables.
- In contrast to other cointegration models ARDL approach capable of coherently and simultaneously estimating both short and long-run parameters in one step and test the hypotheses regardless the order of integration of the variables of interest, whether the variables are I(1) or I(0).
- ARDL estimators of the short-run coefficients are consistent, whereas estimators of the long-run parameters are super-consistent and asymptotically normally

²⁵ Private savings comprise households and corporate savings.

distributed (Gaussian and efficient) irrespective whether the underlying variables are level stationary or first-difference stationary (Pesaran and Shin, 1998)²⁶.

- ARDL by estimating the ECM in a single equation has the advantage of obtaining an economically meaningful interpretation of the estimated parameters and “.... yields superior performance in small samples, particularly in relation to the power of the cointegration tests”(Shin et al., 2011, P. 40).

A two-step estimation procedure is applied where in the first step the orders of the ARDL model has been selected using model selection criteria. Since ARDL approach rectifies residual serial correlation and endogeneity problem by including a sufficient number of lagged values of both the dependent and explanatory variables. Therefore, an appropriate augmentation of the order of the ARDL model is crucial for unbiased estimation and valid inference. In this context, the ARDL procedure will estimate $(p + 1)^k$ number of regressions in order to investigate and choose the optimum combination of lags, number of lags of each variable in the model, that minimise the value of one of the model selection criteria, such as Akaike Information Criterion (AIC), or Schwarz Bayesian Criterion (SC), where (p) is the maximum number of lags that have been chosen and (k) is the number of regressors entered in the model. Then, estimating the parameters and carry out inferences using the ARDL model that have been selected at the first step.

Indeed, ARDL model which order has been chosen based on SC Criterion is performing much better than that has been selected depending on AIC Criterion. As, SC criterion is a consistent model selection criterion whereas AIC is not (Pesaran and Shin, 1998). Therefore, SC is used to determine the augmentation order of ARDL models.

7.5.2 ARDL Approach to Cointegration Analysis

The empirical literatures on financial development are more concern about analysing the long-run relationships (cointegration analysis) between non-stationary variables that are mainly $I(1)$. Furthermore, Hofmann and Mizen (2004) provide evidence that, in time series data analysis, the explanatory variables might affect the dependent variable

²⁶ OLS estimator of the long-run parameters β at ARDL model is T -consistent (super-consistent). While the short-run estimates c , γ_j and ψ_j are \sqrt{T} -consistent. In other words, OLS estimators of the short-run coefficients converge to their real values slower than the long-run parameters do. For further discussion see Pesaran and Shin (1998).

with a time lag. Likewise, the contemporaneous observation of the dependent variable may correlate with the previous observations of the same variable. As financial liberalisation policies might affect savings, investment and economic growth with time lag, the model should be augmented with a sufficient number of lags of both dependent and explanatory variables before the estimation and inferences are conducted. Accordingly, the long-run relationship among the variables of interest could be formulated based on $ARDL(p, q)$ as follows:

$$y_t = c + \phi_1 y_{t-1} + \dots + \phi_p y_{t-p} + \theta_0 x_t + \theta_1 x_{t-1} + \dots + \theta_q x_{t-q} + u_t \quad (7.10)$$

Where c is the intercept, y_t is the dependent variable, x_t is the explanatory variable and (u_t) is the error term which is independent and identically distributed with zero mean and variance σ^2 , $u_t \sim iid(0, \sigma^2)$. Using the lag polynomials, ARDL equation (7.10) can be rewritten as:

$$\phi(L)y_t = c + \theta(L)x_t + u_t \quad (7.11)$$

Where x_t is a $(k \times 1)$ vector of non-stationary variables integrated of order one, $I(1)$, whereas $\phi(L)$ and $\theta(L)$ are the lag polynomials for the dependent and explanatory variables respectively, such that:

$$\phi(L) = 1 - \sum_{j=1}^p \phi_j L^j, \quad \theta(L) = \sum_{j=0}^q \theta_j L^j \quad (7.12)$$

This approach is valid and capable of formulating and detecting the long-run cointegration relationships between variables only where the variables of interest are stationary in their levels, $I(0)$. Once the model includes non-stationary variables, such as $I(1)$ variables, the traditional ARDL model is no longer appropriate and can't be used since any analysis applied using non-stationary variables would be economically meaningless as result of spurious regression problem. So, economists have serious concern regarding time series data analysis. In particular, the concept of stationarity in which the statistical parameters (mean and standard deviation) of variables are tend to be time independent and therefore integrated of order zero, $I(0)$. Otherwise, they are non-stationary and integrated of a higher order d , $I(d)$. Where d indicates the number of times that a time series variable has to be differenced in order to become stationary.

Based on time series analysis literature, Engle and granger two-step approach (Engle and Granger, 1987) and Johansen cointegration approach (Johansen, 1988, Johansen and Juselius, 1990) are the most popular procedures for testing the long-run

relationships between non-stationary variables. However, in order to apply these cointegration techniques, all variables under consideration required to be cointegrated from order one, $I(1)$ as a prerequisite. Talking these into consideration, Pesaran, Shin, and Smith (See i.e., Pesaran and Smith, 1995, Pesaran and Shin, 1998, Pesaran et al., 2001) try to mitigate this problem by developing ARDL approach that capable of identifying the long-run relationships between underlying variables irrespective their order of integration. Whether, they are level stationary or first-order stationary.

Pesaran and Shin (1998) have provided ample of evidence that the traditional ARDL approach mentioned earlier is in fact absolutely valid and able to address and analysis the long-run cointegration relationships even if the underlying variables are non-stationary and integrated of order one $I(1)$. Using simple iterative process, the ARDL model, equation (7.10), can be transformed into an unrestricted error correction specification of the form:

$$\Delta y_t = c + \alpha y_{t-1} + \theta x_{t-1} + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \psi_j \Delta x_{t-j} + v_t \quad (7.13)$$

where c is the intercept, α is the error correction term, which is negative and indicates the speed of adjustment with which the model attain the long-run steady state equilibrium after a shock to the model. Moreover, it should satisfy the stability condition where $(-1 < \alpha < 0)$ so that the model is mean-reverting and dynamically stable. The long-run parameter (β) can be easily estimated as $(\beta = \frac{\theta}{-\alpha})$, whereas γ_j and ψ_j are the short-run dynamic adjustment parameters for the dependent and independent variables respectively. Consequently, ψ_0 indicates the short-run or impact parameter of the independent variable within the contemporaneous year. Finally, v_t is the error term with zero mean and variance σ^2 , in other words, $v_t \sim iid(0, \sigma^2)$.

Additionally, Pesaran and Shin (1998) indicate that the long-run estimators of ARDL are super-consistent and have the standards normal asymptotic distribution, whereas the short-run estimators are \sqrt{T} -consistent. Furthermore, even in the existence of non-stationary variables in the model, the short-run ARDL estimators are still consistent and valid inferences can be obtained using standard Wald or F-test.

As a final point, the effects of exogenous (control) variables on dependent variables (real money balances, investment and savings) are commonly known and recognised at the growth literature. Therefore, including these exogenous variables in the models

would enhance the results and provide more accurate estimations for the parameters. Hence, ARDL model in equation (7.13) can be modified by including a set of exogenous (control) variables and rewritten as follows:

$$\Delta y_t = c + \alpha y_{t-1} + \theta x_{t-1} + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \psi_j \Delta x_{t-j} + \Phi Z_t + v_t \quad (7.14)$$

Where Φ is a $(1 \times k)$ vector of exogenous parameters and Z_t is a $(k \times 1)$ vector of exogenous variables identified in the literature.

7.5.3 Bounds Testing Approach for Cointegration

During the last three decade econometricians have devoted much effort and time in building models that capable of examining and testing the level relationships between variables which know in the literature as cointegration techniques, such as two-step procedure by Engle and Granger (1987), Common-trends test by Stock and Watson (1988), Johansen Cointegration test (1991, 1995) and the residual-based procedure by Shin (1994). However, all these techniques mentioned based on the main pre-assumption that the underlying variables are non-stationary and integrated of order one, $I(1)$, which pre-require testing the order of integration for each time series using unit root tests and/or stationary test before applying these approaches, and hence further degree of ambiguity and uncertainty to the analysis. Moreover, VECM and cointegration test assume that long-run relationships between variables represented in the cointegrating vector are stable and remain constant during the period of consideration. However, in reality the proposition of linear cointegrating relationships between variables is extremely restrictive. Indeed, the long-run relationship between the underlying variables could change due to a sudden shock resulted from economic policy changes, technological progress, economic crisis, changes in people's preferences and institutional development. Shin et al. (2011) pointed out that testing the cointegration relationship between the underlying variables based on a pre-assumption of a stable relationship where the underlying relationship is nonlinear will resulted in spurious regression and invalidate the results. Furthermore, Cointegration tests, such as the Johansen cointegration test, are based on assumption of asymptotic properties and as a result sensitive to the specification error in limited samples.

Pesaran et al. (2001) advance bounds-testing approach, commonly known in econometric literature as PSS bounds-testing approach, to examine the cointegration

relationships between variables using ARDL procedure in the form of unrestricted Error Correction Model (ECM). In other words, this technique detects the long-run relationship between variables by examining the significant of the lagged level of these variables based on standard F-test. As a result, PSS bounds-testing technique can be utilized to any model regardless the order of integration of the variables under consideration and thereby avoid examining the univariate characteristics of the variables of interest using unit-root tests (such as, ADF, PP) or stationary test (for instance, KPSS) that subject to the size distortions problem and have a very low power in finite samples as they tend to reject the null hypothesis often even when its true (Caner and Kilian, 2001, Cochrane, 1991, Schwert, 1989).

Bounds cointegration approach tests the null hypothesis of no long-run relationship between variables, that is, the parameters of the lagged level of the underlying variables are jointly insignificant and equal to zero, against the alternative:

$$H_0: \alpha = \theta = 0$$

$$H_1: \alpha \neq \theta \neq 0$$

However, the asymptotic distribution of computed F-statistic is non-standard under the null hypothesis of no cointegration. As a result, Pesaran et al. (2001) reported two sets of asymptotic critical values against which the computed F-statistic is assessed. These two bounds present the two polar cases which covering all possible classifications of the variables under consideration into $I(0)$, $I(1)$ or mutually cointegrated. The first asymptotic critical value set, the lower bound, assumes that all variables under consideration are non-stationary and integrated of order one, that is $I(1)$, whereas the second set, the upper bound, has been calculated based on the assumption that all variables of interest are stationary and integrated of order zero, $I(0)$. Hence, if the computed F-statistic falls outside these two bounds a conclusive inference can be made otherwise inference would be inconclusive, and hence tests of stationary and the orders of integration of the variables are required.

Once the cointegration relationship between the underlying variables has been confirmed using bounds test. The second step of ARDL approach involves estimating the coefficients of the long-run relationship and the associated error correction representation (ECM) between variables, given by equation (7.14).

Given that the financial time series data are volatile and might be correlated with each other, the OLS estimators might suffer from the autocorrelation and heteroskedasticity problems. Therefore, all estimated models included a sufficient lag augmentation in order to forestall any biased resulted from both autocorrelation and endogeneity problems. Moreover, the Newey-West method has been employed to obtain robust OLS estimators with Heteroskedasticity and Autocorrelation-Consistent (HAC) Standard Errors. Thereby, the inferences remain valid even in the presence of both arbitrary autocorrelation as well as heteroskedasticity problems.

7.6 Empirical Results

This empirical chapter aimed at investigating the effects of financial liberalisation reforms on savings, investment and economic growth rate using time series econometric technique, namely, ARDL model in ECM framework. In particular, investigating whether McKinnon's complementary hypothesis holds for the case of Egypt, where there is a complementary relationship between money and capital accumulation.

To this end, the McKinnon's complementary hypothesis is investigated using two different specifications. In which specification, a set of models are estimated to examine the relationship and channels through which financial liberalization policies could affect the economic growth rate in the case of Egypt. Namely, real money balances and investment model on the one hand, and real money balances and savings model on the other hand.

Before conducting the empirical analysis and given that bounds cointegration test can be applied irrespective of the variables orders of integration are I(1) and/or I(0). It's of important to examine the univariate properties of all variables under consideration before performing the test (Pesaran et al., 2001). Since the presence of I(2) variables violate one of the key assumption of bounds test that all variables under examination should be I(0) and/or I(1) and invalidated the computed F-statistics advanced by Pesaran et al. (2001) (Ouattara, 2004). To this end, ADF and KPSS tests have been employed to investigate the unit root properties of all data series and to determine its degree of integration.

Since we have annual observation the maximum order of lags included in the ARDL specification has been set to one ($n = 1$). Consequently, Schwarz criterion, SC, has been used to select the optimal lag structure for the ARDL model before performing the

estimation and deriving inferences, as SC is a consistent model selection criterion and working effectively in small sample contrary to AIC. Thereafter, general to specific approach has been applied in order to select the final specification of the ARDL model.

7.6.1 Specification One (Real Money Balances and Investment)

7.6.1.1 Real Money Balances Function

The complementary relationship between real money balances and capital accumulation has been tested using two proxies for capital accumulation, that is, total investment ratio and private investment ratio.

The first stage of ARDL technique involves testing the existence of the long-run relationship between real money balances and investment using bounds cointegration test by examining the lagged level variables in the error correction representation of the ARDL model using F-test. Empirical results for ARDL model and bounds cointegration test are reported in Table 7.3. Results in panel (C) provide strong evidence in favour of a long-run relationship between demand for real money balances and the explanatory variables, where the F-statistics (16.0 and 7.8) are higher than the upper bounds of asymptotic critical values (5.61) at 1% level of significant. Therefor, the null hypothesis of no cointegration has been rejected.

The second step of ARDL approach involves estimating the parameters of the long-run relationships, making inferences about their significance and interpreting them according to the economic theory. Panel (A) represents the long-run coefficients for real money balances in model one, using total investment as explanatory variable, and real money balances in mode two, using private investment as dependent variable. Where, income and real rate of deposit are correlated positively with real money balances. However, they are significant only at the second model. An increase in real rate of deposit by 1 unit and income by 1% would expect to increase real money balances by 1.4% and 5% respectively. On the one hand, higher income spur the transaction demand motive for holding money, and on the other hand higher real deposit rate stimulate time and demand deposits which increases the demand for real money balances.

Table 7.3. ARDL Estimates for Real Money Balances FunctionDependent Variable: ΔLM

Regressors	Coefficient for model 1	Coefficient for model 2	
Panel A: the long-run estimates			
Const.	14.1** (6.54)	-11.9 (8.51)	
LY	0.18 (0.26)	1.4*** (0.49)	
I	-0.09*** (0.02)		
I_P	0.001	-0.03 (0.06)	
R	(0.008) -0.22***	0.05** (0.02)	
FLI	(0.04) 0.15***	(0.07) 0.10*	
FDI	(0.04)	(0.06)	
Panel B: the short-run estimates			
ΔLY		-1.88 (3.15)	
ΔI	-0.04** (0.01)		
ΔI_P		-0.04 (0.02)	
ΔR		-0.02* (0.01)	
ecm_{t-1}	-0.84*** (0.11)	-0.65*** (0.12)	
Panel C: Bounds Cointegration Test			
F_{PSS}	16.08***	7.88***	
Panel D: Diagnostic Tests Statistics			
R^2	0.50	R^2	0.54
Adj. R^2	0.35	Adj. R^2	0.30
x_{SC}^2	2.7 [0.10]	x_{SC}^2	1.2 [0.32]
x_H^2	0.25 [0.96]	x_H^2	0.36 [0.94]
x_N^2	6.8 [0.03]	x_N^2	10.3 [0.01]
x_{RESET}^2	0.00 [0.94]	x_{RESET}^2	0.33 [0.57]

Source: Author's calculations

Note: LM , LY , I , I_P , R , FLI , and FDI indicate the flow of real money balances (M_2) logarithm, the real GDP logarithm, total investment ratio, the private investment ratio, real deposit rate, financial liberalization index, and financial development index. x_{SC}^2 , x_N^2 , x_H^2 , and x_{RESET}^2 are LM tests for serial correlation, normality, heteroscedasticity, and functional form (Ramsay's RESET test), respectively. Associated p – values are reported in square parentheses [.]. However, figures in () are HAC standard errors. ***, ** and * indicate significance at the 1%, 5%, and 10%, respectively.

With regard to the theoretical expectation of relationship between money and capital accumulation, the results seems to be surprising. The coefficients of total investment in model 1 and private investment in model 2 are negative (-9%, -3%) with total investment being significant at 1 % whereas the private investment is insignificant. These findings on one hand contradict McKinnon's hypothesis, and on the other hand emphasis the neoclassical view of a substitution relationship between real money balances and capital accumulations; an increase in real return on money would stimulate the demand for real money balances which in turn has detrimental effects on capital accumulation process.

Another striking feature is the negative and significant impact of financial liberalisation index indicates on real money balances, where one point increase in financial liberalisation index decrease real money balances by about 21% on average. Financial reform policies by removing entry barriers and allow for private and foreign financial institution ownerships, increase the number of financial institutions, promote competition in the capital markets and offer several forms of money substitutes such as ATM, credit cards and electronic money transfers. These various types of financial innovations as part of the financial reform program improve the liquidity services provided by the banking sector and offer substitutes for traditional money (currency) and demand deposits which decrease the transactions demand for money.

These financial innovations characterised by high tradable and liquidity brought about by financial liberalisation will substitute money as a store of value (Bordo and Jonung, 1987). In addition, "increased use of credit, better synchronization of receipts and expenditures, reduced mail float, more intensive use of money substitutes and more efficient payment mechanisms will tend to decrease money demand" (Lieberman, 1977, P. 308-9).

Another key factor that could have a negative impact on real money balances would be Dollarization phenomena, where local currency and savings were substituted by US-Dollar. The dollarization ratio was very high at the beginning of financial reform program about 51% in 1991 and reduces to 28.4% in 2004 and 25.4% in 2009 however it is still very high.

Lastly, a one unit increase in financial development index would lead to about 10-15% increase in real money balances. Financial development leads to a larger financial sector

with large financial institutions and better intermediation process, in other words greater deposits and real money balances.

Results in Panel (B), the error correction representation, articulate the dynamic behaviour of the ARDL model, where the coefficient of the error correction term is negative and highly significant at 1% for the two models which confirms the existence of the long-run relationship between the underlying variables and represent the speed of adjustment with which the model attains the long-run steady state equilibrium following an exogenous shock in the short-run. With ECM coefficients ranging from -0.84 to -0.65, the deviation from long-run equilibrium will be corrected by a speed between (65% -84%) every year.

The stability of the short-run dynamics and long-run coefficients for the selected ARDL model could be investigated using the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) stability tests of the recursive residuals. These tests are very crucial since the short-run dynamics seems to be very important in investigating the long-run coefficients stability (Pesaran and Pesaran, 1997). CUSUM test identifies any systematic changes in the model coefficients, whereas CUSUMSQ test reports any unexpected departure of the model's coefficients from the stability.

Figure 7.1 and Figure 7.2 plot the CUSUM and CUSUMSQ statistics for the two models which indicate no systematic or stochastic changes in the coefficients of the ECM model as they are stable and remained within the critical bounds at 5% level of significance. Therefore, the ARDL models adopted in this chapter is robust and precisely estimating and depicting both short and long-run relationship between real money balances, investment and real deposit rate.

Figure 7.1. CUSUM and CUSUMSQ Stability Tests for Model 1

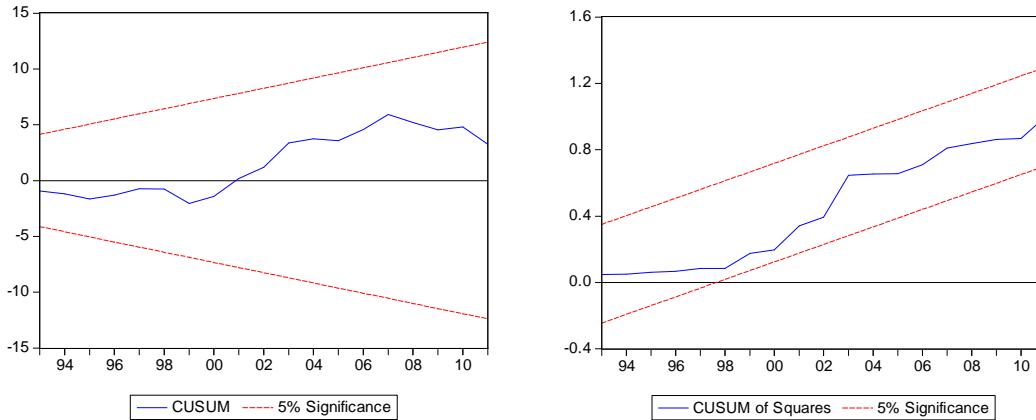
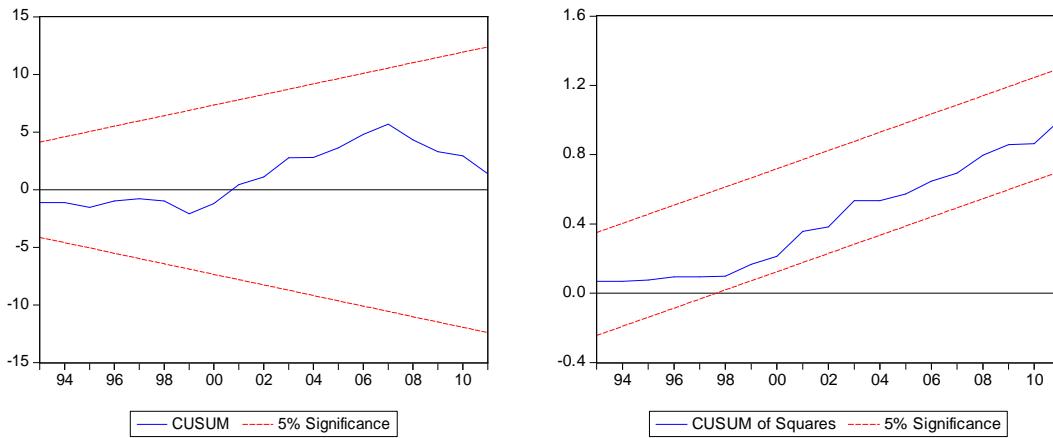


Figure 7.2. CUSUM and CUSUMSQ Stability Tests for Model 2



The straight lines represent the critical bounds at 5% significant level

Finally, the explanatory powers of the models are quite high ($R^2 = 50\% \text{ and } 54\%$) and the statistics of the diagnostic tests doesn't give any evidence of serial correlation, heteroskedasticity or misspecification in the functional form. In addition, OLS estimators for both models have been obtained using Newey-West method that provides heteroskedasticity and Autocorrelation-Consistent (HAC) Standard Errors. Thereby, the inferences remain valid even in the presence of both arbitrary autocorrelation as well as heteroskedasticity problems.

7.6.1.2 Investment Function

Since the complementary hypothesis works both ways, real deposit rate is included at the investment function as one of the explanatory variables with the expectation that the real interest rate on bank deposit is positively correlated with investment and capital accumulation.

Bounds cointegration results, indicates the existence of long-run relationship between investment ratio, private credit ratio and real deposit rate (8.6 and 10.6, see panel c in Table 7.4). Hence, reject the null hypothesis of no cointegration at 1% significant level. This finding is confirmed by a negative coefficients for the error correction term (-0.70 and -0.89), that is, highly significant at 1% level.

Results presented in panel (A) reveal a negative association between real rate of deposits and total/private investment ratios. One unit increase in real rate of deposits would decrease investment by 0.05 units. However, the coefficients are insignificant. Thus, it can be concluded that real money balances and capital accumulations are substitutes; an increase in real return on money would stimulate the demand for real money balances. This, in turn, has detrimental effects on investments. In addition, higher interest rate, that is higher capital cost, would discourage both total and private investment.

Furthermore, the coefficients of private credit ratio are very marginal and negatively correlated with investment, which contradicts the theoretical prediction by endogenous money theory that higher private credit ratio would stimulate investment and capital accumulation, in particular private investment ratio. One unit increase in private credit ratio would discourage total investment and private investment by 0.03 and 0.05 unit respectively; hence it is statistically and economically insignificant. These results could be attributed to the link between financial liberalisation policies and the expansion of mortgage and consumer credit markets. Financial deregulation could dampen the available funds for the business sector through private credit misallocation in favour of households rather than loans to firms and businesses. Unfortunately, data on the allocation of private credit between households and business sector is needed in order to investigate the validity of this proposition further, which is unavailable for the case of Egypt.

Table 7.4. ARDL Estimates for Investment Function

Dependent Variable:	ΔI	ΔI_P	
Regressors	Coefficient for model 1	Coefficient for model 2	
Panel A: the long-run estimates			
Const.	8.41** (7.19)	14.5*** (3.80)	
C_P	-0.03 (0.07)	-0.05 (0.05)	
R	-0.05 (0.08)	-0.5 (0.07)	
FLI	-1.00** (0.39)	-1.3*** (0.31)	
FDI	1.19*** (0.33)	1.24*** (0.31)	
I_G	0.65*** (0.15)	-0.3* (0.16)	
Panel B: the short-run estimates			
ΔC_P	0.13 (0.14)	0.18 (0.16)	
ΔR	-0.03 (0.07)	-0.06 (0.07)	
ecm_{t-1}	-0.70*** (0.20)	-0.89*** (0.18)	
Panel C: Bounds Cointegration Test			
F_{PSS}	8.6***	10.6***	
Panel D: Diagnostic Tests Statistics			
R^2	0.68	R^2	0.55
Adj. R^2	0.57	Adj. R^2	0.39
x_{SC}^2	1.4 [0.27]	x_{SC}^2	2.0 [0.16]
x_H^2	1.6 [0.17]	x_H^2	0.61 [0.75]
x_N^2	0.50 [0.78]	x_N^2	2.3 [0.32]
x_{RESET}^2	2.23 [0.13]	x_{RESET}^2	2.71 [0.09]

Source: Author's calculations

Note: I , I_P , C_P , R , FLI , FDI and I_G indicate total investment ratio, the private investment ratio, private credit ratio, real deposit rate, financial liberalization index, financial development index and public investment ratio. x_{SC}^2 , x_N^2 , x_H^2 , and x_{RESET}^2 are LM tests for serial correlation, normality, heteroscedasticity, and functional form (Ramsay's RESET test), respectively. Associated $p - values$ are reported in square parentheses [.]. However, figures in () are HAC standard errors. ***, ** and * indicate significance at the 1%, 5%, and 10%, respectively.

Financial development index captures the size and activities of the financial system, therefore expanding the size and activities of stock market and banking sector are expected to be positively correlated with investment. One unit increase in financial

development index leads to 1.19 and 1.24 unit increase in total investment and private investment respectively at 1% significant level. Moreover, financial liberalisation programs are associated with better intermediation process, efficient channels of savings into investment and easing liquidity constraints faced by businesses, therefore a deregulated financial system is more likely to have a positive impact on investment and capital accumulation process. However, findings contradict these theoretical expectations, one unit increase in financial liberalisation index reduces total investment and private investment by 1 and 1.3 units at 5% and 1% significant level respectively. On the one hand, enhance financial markets competition through removing entry barriers for domestic and foreign banks would spur financial institutions proliferation which in turn leads to unbalanced portfolios and accumulates non-performing loans at the banking sector, which was the case for Philippines in 1996 (Zaidi, 2006). On the other hand, stock market development and large volume of activities could be directed to speculative activities and trading of existing securities, rather than finance new projects and physical investment. Thereby, financial market development does not only offer new channel for corporations to raise capital and finance investments, but also for speculative activities. Hence, financial deregulation could lead to financialisation, which means that liquidity is made available for speculative purposes rather than productive resources, so therefore have a negative impact on investment and capital accumulation.

Another possible explanation of these result could be that large corporations and business elite compared with small and medium enterprises (SMEs) get more benefits from the financial liberalisation programme, firstly through the extension of capital resources allocation and preferential credit supply to the private sector, and secondly by changing the ownership and structure of the financial system through appreciation of private and foreign banks ownership and development of stock market, which purely blocked the small and medium enterprises (SMEs) from getting sufficient credit from financial system. Hence, entrepreneurs who are well connected politically have unrestricted access to credit from the financial system where lending decisions were made based on the political clientelism, and as a result they get the majority of the financial reform program advantages.

Lastly, public investment has a positive impact on total investment where one unit increase in public investment would stimulate total investment by 0.6 unit at 1% significant level. Conversely, it has harmful influences on private investment through

crowding out effects, one unit increase in public investment decreases private investment by 0.3 at 10% significant level.

The stability of the long and short-run parameters at both models, total investment and private investment, have been confirmed by CUSUM and CUSUMSQ. Figure 7.3 and Figure 7.4 demonstrate that CUSUM and CUSUMSQ remain within the critical bounds at 5% level of significant. So therefore, the coefficients of the ECM model are stable without any tendency towards systematic or stochastic changes. Finally, the models pass all the diagnostic tests at 5% significant level with high explanatory powers ($R^2 = 68\%$ and 55%).

Figure 7.3. CUSUM and CUSUMSQ Stability Tests for Model 1

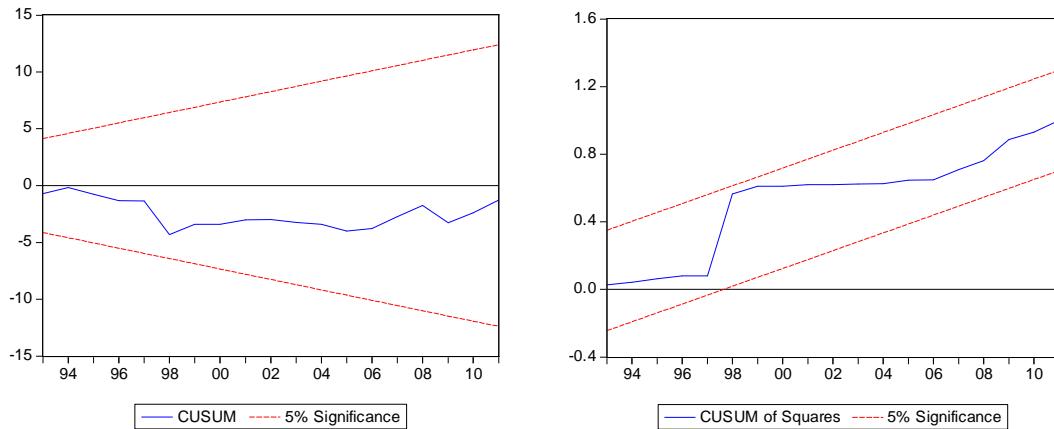
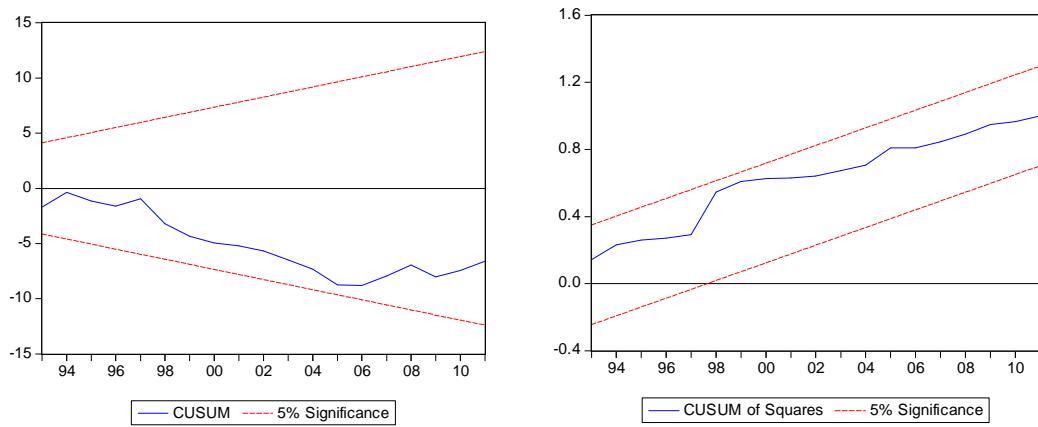


Figure 7.4. CUSUM and CUSUMSQ Stability Tests for Model 2



The straight lines represent the critical bounds at 5% significant level

7.6.2 Specification Two (Real Money Balances and Saving)

In this specification the relationship between financial liberalisation, the demand for real money balances and savings along with other determinants were explored in the case of Egypt based on McKinnon's complementary hypothesis.

7.6.2.1 Real Money Balances Function

Panel (c) in Table 7.5, shows the results for Bounds test, which indicate the existence of a long-run relationship between real money balances and their explanatory variables. F-statistics (20.5 and 27.1) are above the upper bounds at 1% significant level (4.79). As a result the null hypothesis of no cointegration has been rejected. Furthermore, the coefficients of the error correction term in panel (B) have the expected negative sign (-0.80 and -0.95) and are statistically significant at 1% level. This confirms the existence of the long-run relationship between real money balances and the independent variables in these two models. Furthermore, the long-run estimates are presented in panel (A). Whereas, income, real deposit rate and financial development have a positive impact on real money balances, financial liberalisation has a negative and highly significant effects. These results are not surprising and confirm our previous findings [for detailed discussion see real money balances model in specification one, section (7.6.1)].

McKinnon postulates that financial liberalisation, by increasing real deposit rate, easing financial constraint and improving financial intermediation process, has a positive and significant impact on domestic savings and hence real money balances. According to this theoretical hypothesis the coefficients of savings are expected to be positive and highly significant. Indeed, this hypothesis has been confirmed by the results, an increase in total savings ratio or private savings ratio by 1 unit would increase real money balances by 10% or 5% respectively.

Table 7.5. ARDL Estimates for Real Money Balances Function

Dependent Variable:	ΔLM		
Regressors	Coefficient for model 1	Coefficient for model 2	
Panel A: the long-run estimates			
LY	0.70*** (0.02)	0.70*** (0.005)	
S	0.10** (0.04)	0.05*** (0.00)	
S_P	0.04** (0.01)	0.008 (0.009)	
R	-0.15*** (0.02)	0.07*** (0.01)	
FLI	0.14*** (0.008)		
FDI			
Panel B: the short-run estimates			
ΔLY	-6.72** (2.70)	-4.68** (2.00)	
ΔS	0.03** (0.01)		
ΔR	-0.01* (0.008)		
ecm_{t-1}	-0.80*** (0.11)	-0.95*** (0.11)	
Panel C: Bounds Cointegration Test			
F_{PSS}	20.5***	27.19***	
Panel D: Diagnostic Tests Statistics			
R^2	0.54	R^2	0.50
Adj. R^2	0.37	Adj. R^2	0.40
x_{SC}^2	0.514 [0.85]	x_{SC}^2	4.86 [0.02]
x_H^2	3.14 [0.10]	x_H^2	0.50 [0.80]
x_N^2	7.80 [0.02]	x_N^2	1.17 [0.55]
x_{RESET}^2	0.005 [0.94]	x_{RESET}^2	0.18 [0.67]

Source: Author's calculations

Note: LM , LY , S , S_P , R , FLI , and FDI indicate the flow of real money balances (M_2) logarithm, the real GDP logarithm, domestic savings ratio, the private savings ratio, real deposit rate, financial liberalization index, and financial development index. x_{SC}^2 , x_N^2 , x_H^2 , and x_{RESET}^2 are LM tests for serial correlation, normality, heteroscedasticity, and functional form (Ramsay's RESET test), respectively. Associated $p - values$ are reported in square parentheses [.]. However, figures in () are HAC standard errors.

This model was unstable with constant, where the error correction term being less than one ($ecm_{t-1} < 1$), while the coefficient of the constant is insignificant. As a result, the constant has been removed since its removal enhances the results and improves SIC of the model considerably. In addition, Figure 7.5 and Figure 7.6 portray the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) to examine the stability and specification of the models. Graphs indicate that CUSUM and CUSUMSQ remain within the critical bounds at 5% significant level. In other words, the long-run coefficients are stable and the models are correctly specified.

Figure 7.5. CUSUM and CUSUMSQ Stability Tests for Model 1

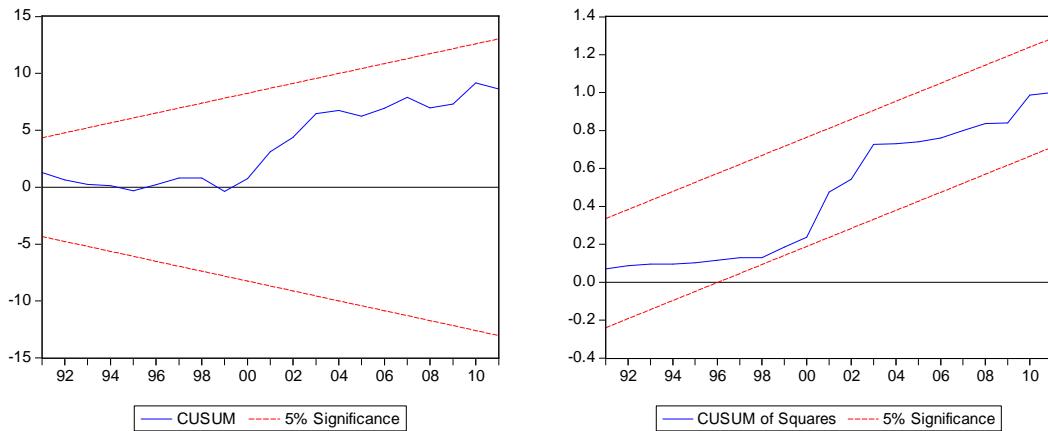
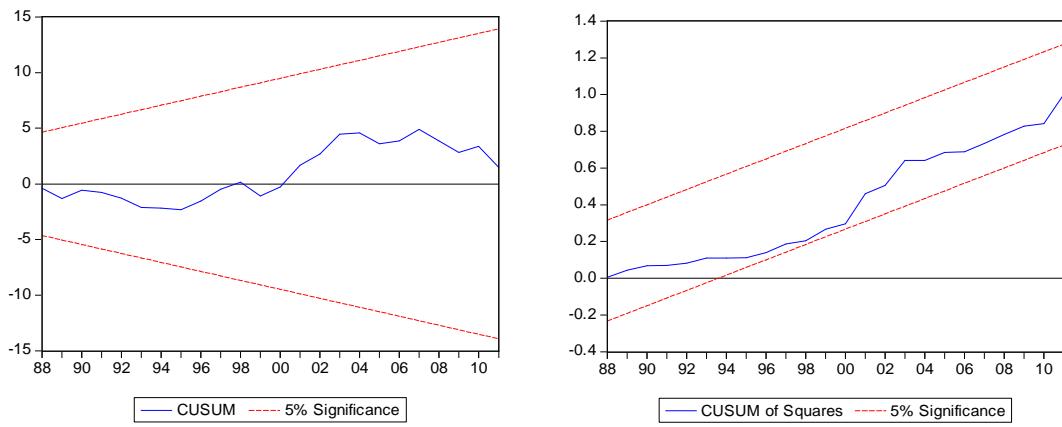


Figure 7.6. CUSUM and CUSUMSQ Stability Tests for Model 2



The straight lines represent the critical bounds at 5% significant level

7.6.2.2 Savings Function

The long-run relationship between savings, income, real money balances, real deposit rate and financial liberalisation index is confirmed firstly by bounds cointegration test at 1% significant level, and secondly by negative error correction terms (-0.60 and -0.66)

that is significant at 1% level. The error correction terms depict the speed of the dynamic adjustment of the model from the short-run disequilibrium to the long-run steady-state equilibrium.

According to McKinnon, savings and investment are identical and perfect substitutes. So therefore, higher savings would increase the real money balances and vice versa. Thereby, for the complementary hypothesis to be true, the coefficients of real money balances should be positive and significant in these two models.

Results indicate that 1% increase in real money balances would have a significant and marginal increase in total savings ratios by 0.05 units, whereas private saving ratio will have an insignificant increase of 0.007 units. Hence, changes in real money balances are statistically and economically insignificant, which contradict McKinnon hypothesis.

In addition, empirical studies which examine income-savings relationship illustrate that income and savings are positively correlated, however the elasticity of savings to income is country-specific factor that vary considerably across countries (Rauf and Shah, 2010). Developing economies tend to have high and positive elasticity of savings to a change in income as a result of consumption behaviours dependence on current income (Corbo and Schmidt-Hebbel, 1991, Haque and Montiel, 1989). However, as the economic development and demographic changes took place the positive correlation between savings and income tend to be very weak and trivial (Loayza et al., 2000). According to our results, income has positive and statistically significant coefficients, where 1% increases in income leads to 0.28 and 0.06 percentage point increase in total and private savings ratios respectively.

The ultimate impact of real deposit rate on savings could be positive or negative based on the relative importance and magnitudes of income and substitution effects. Real deposit rate could have positive effects on savings if income effect is greater than the substitution effect, which is the case in our model. The evidence suggests that 1 unit increase in real deposit rate would stimulate the total and private saving ratios by 0.98 and 0.09 percentage point respectively. However, it is marginal and insignificant in the private saving model. Empirical literature on developing countries articulate that real deposit rates at best have a trivial and positive impact on savings (Srinivasan et al., 1993).

The first striking feature of our results is the negative coefficients of financial liberalisation index. These findings suggest that a 1 unit increase in financial liberalisation index would roughly leads to 3.3 and 0.13 percentage point decline in total savings and private savings respectively, although, it is only statistically significant at 5% in total savings model. Increasing household's access to credit through easing credit constraints on households and develop mortgage and consumer credit markets resulted from financial system deregulation would have detrimental effects on savings and economic growth rate. These results are not surprising, similar results have been reported previously in the literature (see i.e., Achy, 2005, Bandiera et al., 2000, Hermes, 2005, Jappelli and Pagano, 1994, Rauf and Shah, 2010, among others). These findings contradict McKinnon (1973) and Shaw (1973) who argue that financial liberalization policies will induce public and households to increase their savings, which from one hand encourage and boost financial intermediation process and on the other hand, accelerate the supply of loanable fund available to the private sector.

The public saving as a ratio to GDP is included in the model to account for Ricardian equivalence hypothesis according to which private savings is used to offset the negative changes in public savings. In other words, incremental budget deficit coupled with negative public savings will be substituted by higher private savings. The negative and statistically significant coefficient of public saving ratio supports Ricardian equivalence hypothesis. Where, 1 unit increase in public saving ratio would leads to 0.7 percentage point decline in private savings. However, there is a positive association between external debt as a share of GDP and savings, 1 unit increase in external debt ratio would increase total and private savings by 0.13 and 0.04 percentage point respectively, although it's economically and statistically insignificant in the private saving model. These results are consistent with former empirical literature (Achy, 2005, Loayza et al., 2000) which confirm Ricardian equivalence and report insignificant but positive relationship between external debt and savings in developing countries.

Table 7.6. ARDL Estimates for Savings Function

Dependent Variable:	ΔS	ΔS_P	
Regressors	Coefficient for model 1	Coefficient for model 2	
Panel A: the long-run estimates			
Const.	-493*** (134)	-109 (67.5)	
LY	28.5** (9.94)	6.12* (3.68)	
LM	5.23*** (1.32)	0.77 (1.69)	
R	0.98** (0.34)	0.09 (0.13)	
FLI	-3.37** (1.32)	-0.13 (0.22)	
ED	0.13*** (0.03)	0.04 (0.03)	
S_G	0.47** (0.17)	-0.70*** (0.07)	
Panel B: the short-run estimates			
ΔLY	27.5 (17.69)	18.2** (8.14)	
ΔLM		1.52* (0.91)	
ΔR	-0.05 (0.05)	0.11** (0.04)	
ΔFLI	-0.67 (0.63)	0.70** (0.29)	
ecm_{t-1}	-0.60*** (0.11)	-0.66*** (0.10)	
Panel C: Bounds Cointegration Test			
F_{PSS}	18.1***	42.4***	
Panel D: Diagnostic Tests Statistics			
R^2	0.83	R^2	0.94
Adj. R^2	0.70	Adj. R^2	0.89
x_{SC}^2	0.44 [0.51]	x_{SC}^2	1.60 [0.23]
x_H^2	1.03 [0.47]	x_H^2	0.29 [0.98]
x_N^2	0.75 [0.68]	x_N^2	1.01 [0.60]
x_{RESET}^2	2.6 [0.11]	x_{RESET}^2	0.003 [0.95]

Source: Author's calculations

Note: S , S_P , LY , LM , R , FLI , ED and S_G indicate the domestic savings ratio, the private savings ratio, real GDP logarithm, the flow of real money balances (M_2) logarithm, real deposit rate, financial liberalization index, external debt ratio and public saving ratio. Furthermore, x_{SC}^2 , x_N^2 , x_H^2 , and x_{RESET}^2 are LM tests for serial correlation, normality, heteroscedasticity, and functional form (Ramsay's RESET test), respectively. Associated p -values are reported in square parentheses [.]. However, figures in () are HAC standard errors. ***, ** and * indicate significance at the 1%, 5%, and 10%, respectively.

As regards the diagnostic tests, R^2 values for both models are quite high (83% and 94%) and suggest a good fit of the estimated ARDL models. In addition, the robustness of the model has been investigated by several diagnostic tests such as Breusch- Godfrey serial correlation test, ARCH test, Jacque-Bera normality test and Ramsey RESET specification test. Models have passed all the diagnostic tests with high probability value. Furthermore, the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) in Figure 7.7 and Figure 7.8 indicate that the model's coefficients are stable in the long-run as the graphs lie within the critical bounds at 5% significant level.

Figure 7.7. CUSUM and CUSUMSQ Stability Tests for Model 1

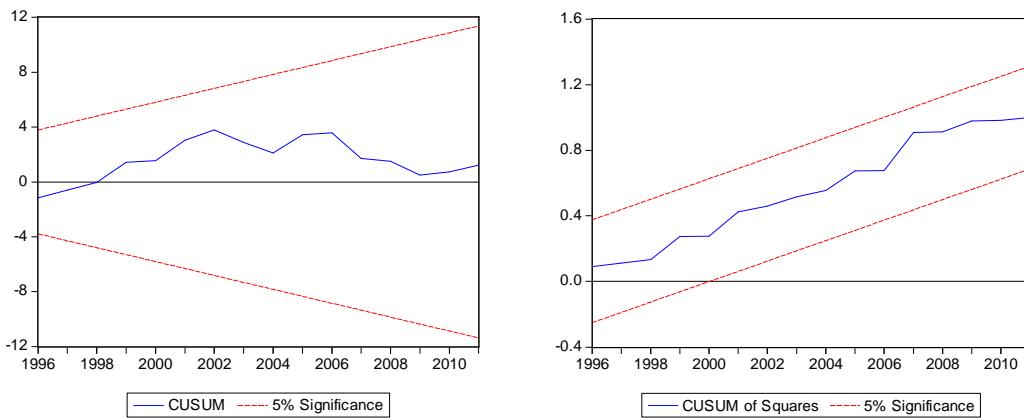
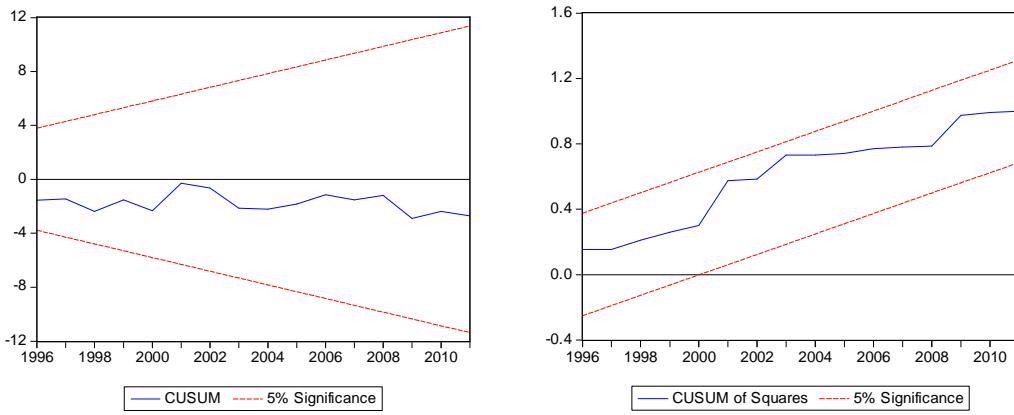


Figure 7.8. CUSUM and CUSUMSQ Stability Tests for Model 2



The straight lines represent the critical bounds at 5% significant level

7.7 Summary and Conclusions

This empirical chapter examines the effects of financial reform on savings, investment and hence the macroeconomic performance for Egypt. In particular, this chapter investigate the validity of McKinnon's complementary hypothesis, in which a

complementary relationship between money and capital accumulation has been proposed, using an extensive data set, and bounds cointegration test within ARDL econometric techniques. This chapter, also, focuses on financial regulation and policies, which have been followed through the implementation of Economy Reform, and Structural Adaptation Program (ERSAP) advanced by the World Bank and the International Monetary Fund and whether these new trends in managing the Egyptian economy affect positively the performance of the financial system and economic growth through improving the allocation efficiency of the financial resources available to the enterprises.

Some economists (Such as; Arestis et al., 2003a, Demirgut-Kunt and Detragiache, 1998, Zaidi, 2006, among others) indicate that financial liberalization programs have been at the root of stock market volatility, financial system destabilization and banking crises in many countries. These deter capital accumulation process and economic growth, particularly during the initial phases of financial liberalization programs. Frangakis (2009) examines the main elements of financial sector deregulation programs in the context of European countries and indicates that financial deregulation policies stimulate financial systems extension without sufficient preparation. This, in turn, leads to credit booms, financial instability and fragility which have detrimental effects on investment and capital accumulation process. This is particularly true, given the potential negative impact of stock markets on economic development, due to the associated volatility and speculation processes coupled with financial liberalization policies.

The empirical findings from one hand indicate that McKinnon's complementary hypothesis does not hold for the case of Egypt and on the other hand emphasis the neoclassical view of a substitutional relationship between real money balances and capital accumulations rather than complementary relationship; an increase in real return on money would stimulate the demand for real money balances, which in turn has detrimental effects on investment and capital accumulation process. Furthermore, financial liberalisation process has a negative impact on savings and investment in Egypt.

Likewise, results indicate that financial system development did lead to larger financial systems which positively contribute to savings, investment and economic growth.

However, financial liberalisation and deregulation as such might have different effects on savings and investment through adversely affecting banks, investors and household's behaviours inside the economy. Financial liberalisation policies stimulate the expansion of mortgage and consumer credit markets. Thus, financial deregulation could dampen the available funds for the business sector through private credit misallocation in favour of households rather than loans to firms and businesses. Unfortunately, data on the allocation of private credit between households and business sector is needed in order to investigate the validity of this proposition further, which is unavailable for the case of Egypt. These findings are in line with Hussain (1997). His empirical results did not support the financial liberalisation hypothesis, that higher real interest rate would have a positive impact upon investment and economic growth, although financial developed is positively associated with real GDP per capita in the case of Egypt.

Furthermore, large corporations and business elite compared with small and medium enterprises (SMEs) get more benefits from the financial liberalisation programme, firstly through the extension of capital resources allocation and preferential credit supply to the private sector, and secondly by changing the ownership and structure of the financial system through appreciation of private and foreign banks ownership and development of stock market. These purely blocked the small and medium enterprises (SMEs) from getting sufficient credit from financial system. Hence, entrepreneurs who are well connected politically have unrestricted access to credit from the financial system where lending decisions were made based on the political clientelism, and as a result they get the majority of the financial reform program advantages.

Furthermore, financial market development does not only offer new channel for corporations to raise capital and finance investments, but also great opportunity for speculative activities. Hence, financial deregulation could lead to financialisation, which means that liquidity is made available for speculative purposes rather than productive resources, so therefore have a negative impact on investment and capital accumulation.

Finally, financial innovations brought about by financial reform programme, such as ATM, credit cards and electronic money transfers, improve the liquidity services provided by the banking sector and offer substitutes for traditional money (currency) and demand deposits which decrease the transactions demand for money. Otherwise, increasing household's access to credit through easing credit constraints on households

and develop mortgage and consumer credit markets brought about by financial system deregulation would have detrimental effects on savings and economic growth rate. These results are consistent with Baliamoune (2006) who reports a negative impact of financial reforms on savings and economic growth in the case of Morocco. In addition, Okpara (2010) and Ogwumike and Ikenna Ofoegbu (2012) indicate that financial liberalisation has a detrimental effects on savings and investment in the long-run in the case of Nigeria and as a result conclude that McKinnon's complementary hypothesis seems not to be valid in the developing countries.

To conclude, although the positive impact of financial system development on savings and investment in Egypt is obvious and cannot be ignored. Financial sector doesn't consider being a sold vehicle for real investment and higher economic growth as better institutional and legal framework, more information disclosure and transparency needed. Moreover, during the implementation of financial liberalization programmes, some forms of financial controls, such as interest rate controls, might be potentially stabilizing tools that have a positive effect on economic growth and resources allocation efficiency rather than a form of financial repression.

Accordingly, on the one hand, future financial policies should strength legal and institutional environment in order to enhance operation efficiency in the financial system, and on the other hand, encourage policies that repress the demand for money, and speculation activities so as to spur investment and economic growth rate.

8 Financial structure and economic development with special reference to Egypt

8.1 Introduction

In the light of the rapid growth of financial markets since 1980s and, over the last four decades, their intermediation role increased as a new element of the financial system's components which provided different financial services from those provided by the banking systems. This is particularly so in developing and emerging countries such as Asian financial markets and the MENA region. A large body of literature indicated that, as the economic development took place and the economy grew, the financial markets tended to grow faster than the banking sector as a percentage of the overall financial system. To this end, this chapter intended to explore the relationship between financial structure and economic development in the context of the new structuralism hypothesis which is considered, also, to be another key aspect of the interrelated relationship between finance and growth. In other words, Chapter eight evaluates the validity of the new structuralism hypothesis highlighting a dynamic relationship between country's financial structure and the phase of economic development.

This chapter's central idea is that different structures of the real sector and industries had different firms and projects with various types of risk; size; and financial needs. Therefore, at different stages of economic development in the real sector, dynamic change creates the demand for different types of financial instruments; contracts; and institutions. Consequently, particular types of financial system structures exist and are more effective than others in managing particular types of risk; matching savings with investment; promoting efficient allocation of resources and spurring economic growth at particular points of time and stages of economic development.

This chapter contributes to the literature by investigating the relationship between financial structure and economic development using Non-linear ARDL techniques. For the best of our knowledge, this empirical chapter would be the first attempt to investigate the relationship between financial structure and economic development that takes into account the non-linear relationship between these two variables using the most recent econometric technique, namely Non-linear ARDL approach. Furthermore, empirical studies that investigate the relationship between financial structure and

economic development in the case of Egypt are very rare and limited to Bolbol et al. (2005). Therefore, this empirical chapter tend to fill the gap in the literature through examining the link between financial structure and economic development in the context of Egypt with the most recent available data and accurate measure for financial structure.

The objectives of this chapter are to investigate the relationship between financial structure and economic growth rate in the case of Egypt in the light of the fundamental role that financial policies and institutions play in financing investment and enhancing the economic growth rate. Financial structure could be defined as “the mix of financial markets, institutions, instruments and contracts that define how financial activities are organized at a particular date” (Allen et al., 2006, P., 2). Hence, the main research questions that will be addressed in this chapter are:

- (i) What is the relationship between financial structure and economic development?
- (ii) Is financial structure stable or dynamic and determined endogenously by the level of economic development?

The rest of the chapter is structured as follows. Section 8.2 introduces the econometric methodology and Non-linear ARDL model. While, section 8.3 presents the data sources and variables construction. Then, section 8.4 contains the specification of the model and section 8.5 examine empirically the issue of financial structure in the context of Egypt and whether or not the argument of this chapter matches easily with the Egyptian experience. Finally, the last section summarizes and concludes.

8.2 Econometric Methodology: ARDL Model

A large body of empirical literature using panel and cross section techniques failed to provide a concrete evidence for the relationship between financial structure and economic development. Since panel and cross-section studies pooling data for a wide range of countries at different stages of economic development and as a result they are subject to a number of criticisms. Levine and Zervos (1996) show that results from pooled cross-country regression are biased and subject to changes in the conditioning information set, and suffer from measurement, statistical, and conceptual problems. Moreover, Pesaran and Smith (1995) illustrate that estimates from dynamic heterogeneous panel approach are biased, misleading, and mask important differences

between countries because of the heterogeneity of the estimators across countries. Furthermore, Arestis and Demetriades (1996) indicate that cross-section studies may not be able to address the question of causality and relationship between financial development and economic growth. Since institutional factors, financial policies, and country specific factors may affect the relationship between financial development and economic growth.

In the same vein, Arestis et al. (2010) using both time series data and methods along with dynamic heterogeneous panel approach for six countries including low and middle income countries, namely, Greece, India, South Korea, the Philippines, South Africa, and Taiwan, to test the relationship between financial structure and economic growth. Results show that data cannot be pooled for these countries since panel regression techniques hide major differences across-countries and that financial structure is matter for the economic growth since it significantly affects the real GDP per capital. Finally, Lee (2012) re-examines the relative advantages of bank-based versus market-based financial system in stimulating the long-run economic growth, using time series analysis and Granger Causality test for six countries. Results indicate that time series techniques are more powerful than cross section which partially capture the dynamic relationship between variables, since cross sections studies based on the assumption of stable relationship. However, in fact the relationship between financial structure and economic development may change and evolve over the time and the path of economic development. To this end, ARDL and NARDL techniques have been applied to investigate the relationship between financial structure and economic development.

8.2.1 Non-linear Autoregressive Distributed Lag (NARDL)

Nonlinearity is common in macroeconomics variables and associated with many macroeconomic relationships. The proposition of linear relationships between economic factors is extremely restrictive, mainly where there is economic policy intervention in the economy during the sample span, and transaction costs are significant and play key role in the market. Shin et al. argue that “the imposition of long-run symmetry where the underlying relationship is nonlinear will confound efforts to test for the existence of a stable long-run relationship and will result in spurious dynamic responses”(Shin et al., 2011. P, 35). On the other hand, there is a great emphasise on the short run asymmetry where economic agents behave differently to negative or positive shocks.

Schrderet (2001) investigate the asymmetric cointegration relationship in a bivariate model through decomposing the explanatory variables into positive and negative changes using partial sum process. On this basis, Granger and Yoon (2002) present the notion of “hidden cointegration” where the asymmetric cointegration relationship between variables exist if their positive and negative partial sums are cointegrated with each other in the long-run. Furthermore, they indicate that standard symmetric cointegration model is a special case of hidden coinegration, where the latter can be derived easily from the asymmetric cointegration model.

The empirical literature investigating non-linear (asymmetry) co-integration relationships is mainly dominated by three regime switching error correction models. Firstly, the threshold error correction mechanism advanced by Balke and Fomby (1997), in which the long-run cointegration relationship and the threshold have been tested separately based on the two-step Engle-Granger procedure. Additionally, Markov regime-switching estimates two error correction models with different rates of adjustment to the long-run steady state equilibrium, whereas the transition between these two regimes evolve according to Markov process (Psaradakis et al., 2004). Finally, the smooth transition ECM proposed by Kapetanios et al. (2006) in which a nonlinear smooth transition error correction framework and a pragmatic residual have been applied based on the two-step Engle-Granger approach.

Indeed, the three regime switching models mentioned earlier can be applied to the long-run co-integration relationship (Saikkonen and Choi, 2004). However, formulating the long-run co-integration relationship in linear (symmetry) form of non-stationary variables may not be acceptable and markedly restrictive, since long-run co-integration relationship could also be non-linear (asymmetry). Furthermore, in practise its highly challenging to obtain a model capable of jointly modelling long and short-run co-integration relationships considering that the identification of the threshold variables and selection of the transition functional forms are extremely difficult (Shin et al., 2011, Saikkonen, 2008).

More recently, Shin et al. (2011) have developed NARDL methodology, which is a simple and easy approach of modelling both asymmetric long-run and short-run relationships between variables instantaneously and precisely. The dynamic error correction representation (ECM) based on the NARDL approach is estimated in a single unique step which “improve the performance of the model in small samples, and

particularly in terms of the power of the cointegration tests" (Shin et al., 2011. p, 34). Thus, non-linear ARDL model is more coherently and efficient in modelling both short and long-run asymmetries co-integration relationships than the two-step Engle-Granger approach (1987). Another advantage of NARDL technique is the ability to easily depict and illuminate the change in asymmetry direction between short and long-run (Shin et al., 2011). Besides, unrestricted error correction mechanism based on non-linear ARDL model gives the opportunity to jointly address the issue of non-stationary time series variables in conjunction with non-linearity co-integration relationships.

In addition, long and short-run asymmetry can be tested simultaneously using NARDL model. Moreover, asymmetric cumulative dynamic multipliers provide comprehensive and clear patterns of the asymmetric dynamic adjustment and movements towards the new steady-state equilibrium following any interruption to the system –positive or negative shocks. To this end, a non-linear ARDL (NARDL) model has been introduced to jointly model and analyse the short and long-run asymmetries -nonlinearities- through decomposing the explanatory variable into partial sums of positive and negative changes.

To start with, the asymmetric long-run cointegrating relationship can be modelled based on the partial sum decomposition processes as:

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- + u_t \quad (8.1)$$

Where y_t is the dependent variable, x_t is $(k \times 1)$ vector of the explanatory variables that can be decomposed into:

$$x_t = x_0 + x_t^+ + x_t^- \quad (8.2)$$

Where x_t^+ and x_t^- , are the partial sum decomposition processes of positive and negative changes in regressors advanced by Schrderet (2001), this corresponds to:

$$x_t^+ = \sum_{j=1}^t \Delta x_j^+ = \sum_{j=1}^t \max(\Delta x_j, 0), \quad x_t^- = \sum_{j=1}^t \Delta x_j^- = \sum_{j=1}^t \min(\Delta x_j, 0) \quad (8.3)$$

However, this model is too shallow and restrictive. Considering that, it does not correct for residual serial correlation and/ or endogeneity problems variables, which extremely affects the properties of OLS estimators and their asymptotic distribution, particularly in small samples. As a result, "OLS estimators may remain super-consistent but the asymptotic distribution is non-Gaussian. Hence, hypothesis testing cannot be carried out in the usual manner" (Shin et al., 2011. p, 11).

Following Shin et al. (2011), Equation (8.1) can be modified to allow for long-run asymmetric cointegration, such that the model specification turns out to the following nonlinear ARDL(p, q) model:

$$y_t = \sum_{j=1}^p \phi_j y_{t-j} + \sum_{j=0}^q (\theta_j^+ x_{t-j}^+ + \theta_j^- x_{t-j}^-) + \varepsilon_t \quad (8.4)$$

Where ϕ_j is the long-run autoregressive parameter, while θ_j^+ and θ_j^- are the asymmetric distributed-lag parameters for the regressors, and ε_t is the error term with zero mean and finite variance, $\varepsilon_t \sim iid(0, \sigma_\varepsilon^2)$.²⁷

Following Pesaran et al. (2001) and Shin et al. (2011) the corresponding non-linear error correction representation associated with the former non-linear ARDL (p, q) model can be written as follows:

$$\Delta y_t = \rho y_{t-1} + \theta^+ x_{t-1}^+ + \theta^- x_{t-1}^- + \sum_{j=1}^{p-1} \varphi_j \Delta y_{t-j} + \sum_{j=0}^{q-1} (\pi_j^+ \Delta x_{t-j}^+ + \pi_j^- \Delta x_{t-j}^-) + v_t \quad (8.5)$$

Where the corresponding asymmetric long-run parameters can easily be estimated as:

$$\hat{\beta}^+ = -\hat{\theta}^+/\hat{\rho} \text{ and } \hat{\beta}^- = -\hat{\theta}^-/\hat{\rho} \quad (8.6)$$

Since all parameters contained in Equation (8.5) are linear, the model can be easily estimated using standard OLS method.²⁸ Moreover, NARDL model in a dynamic context (ECM) gives the opportunity of simultaneously modelling both long-run cointegration relationship and short-run dynamic adjustment between variables. In this context, the null hypothesis of no cointegrating long-run relationship between the levels of the variables ($\rho = \theta^+ = \theta^- = 0$) can simply be checked by bounds testing approach based on F-test regardless whether the underlying variables are I(0), and/or I(1) (Pesaran et al., 2001). Where, (K) is the number of explanatory variables included in the long-run relationship prior to their decomposition into positive and negative partial sums. In other words, using more conservative critical value, in which case rejecting the null hypothesis gives strong evidence of cointegrating relationship between the explanatory variables.

²⁷ This model estimate the differential effects of positive and negative changes in the explanatory variables growth rate, based on the positive and negative partial sum processes which assume the existence of a unique known threshold, mostly a zero threshold. However, this assumption will be relaxed in the next step and the model will be modified to adapt the more general case of multiple unknown thresholds. For further information see, Shin et al. (2011) and Greenwood-Nimmo et al. (2011).

²⁸ OLS estimators for the short-run parameters are \sqrt{T} -consistent and asymptotically normally distributed, where the long-run estimators are T-consistent and have mixture normal distributions.

In addition, this unrestricted specification of NARDL error correction model, equation (8.5) declares two different types of asymmetry, short and long-run asymmetries, which reflects three nested restriction or models that can be tested by means of the standard Wald tests (Shin et al., 2011):

- (i) long-run symmetry model where the null hypotheses of a symmetric long-run cointegration relationship can be tested through ($\theta^+ = \theta^- = \theta$)
- (ii) short-run symmetry model in which the null hypothesis of additive symmetry can be tested (Greenwood-Nimmo et al., 2012) using the null hypothesis that:²⁹ $\sum_{j=0}^{q-1} \pi_j^+ = \sum_{j=0}^{q-1} \pi_j^-$, for $j = 0, 1, \dots, q - 1$
- (iii) Finally, the most restricted model, where short and long-run symmetry can be easily and jointly tested by the same process. Once, the null hypotheses of short and long-run symmetric restrictions accepted, the model contracts to error correction form of the standard linear ARDL (p, q) model proposed by Pesaran and Shin (1998):

$$\Delta y_t = \rho y_{t-1} + \theta x_{t-1} + \sum_{j=1}^{p-1} \varphi_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \pi_j \Delta x_{t-j} + v_t \quad (8.7)$$

Asymmetric ARDL approach, gives the ability to clarify and depict the patterns of the asymmetric dynamic adjustments following a shock from the original equilibrium towards the new long-run steady state of the model by estimating the asymmetric cumulative dynamic multipliers, computes as follows:

$$m_h^+ = \sum_{j=0}^h \frac{\partial y_{t+j}}{\partial x_t^+}, \quad m_h^- = \sum_{j=0}^h \frac{\partial y_{t+j}}{\partial x_t^-}, \quad h = 0, 1, 2 \dots \quad (8.8)$$

Where m_h^+ and m_h^- , the asymmetric cumulative dynamic multipliers, illustrate the effects on y following a unit changes in x_t^+ and x_t^- respectively. It's obvious that, as h goes to infinity m_h^+ and m_h^- move towards the asymmetric long-run parameters β^+ and β^- . Hence, NARDL technique provides a very powerful and easy technique, dynamic multipliers, which allow to jointly analysis both short and long-run asymmetries.

²⁹ Two types of short-run asymmetry can be identified, strong or pairwise asymmetry where $\pi_j^+ = \pi_j^-$ and weak or additive asymmetry as an alternative in which $\sum_{j=0}^{q-1} \pi_j^+ = \sum_{j=0}^{q-1} \pi_j^-$. In this context, we will limit our analysis to the additive asymmetry form. For further discussion refer to Shin, Yu, and Greenwood-Nimmo (2011) and Greenwood-Nimmo, Shin, van Treeck (2012).

8.2.2 Searching for an Unknown Threshold

The previous analysis based on a central assumption of the partial sum decomposition process, that is, the explanatory variable has been decomposed into positive and negative partial sum around a zero threshold, hence generating positive and negative fluctuations of the explanatory variable growth rate. “However, in the case where the growth rates of time series of interest are predominately positive (negative), this may result in a situation where the number of effective observations in the negative (positive) regime is insufficient for the OLS estimator to be well determined (i.e. the use of a zero threshold may introduce the a finite sample problem in one regime)” (Greenwood-Nimmo et al., 2011, p. 8), which is true in our case. Therefore, a partial sum decomposition process around a non-zero threshold (γ) has been applied in order to circumvent this problem, as follows:

$$\Delta x_j^+ = \sum_{j=1}^t \max(\Delta x_j, \gamma), \quad \Delta x_j^- = \sum_{j=1}^t \min(\Delta x_j, \gamma) \quad (8.9)$$

Where the threshold variable observations (x_i) can be divided into groups based on whether the observations are greater or smaller than the threshold value (γ). Thereafter, the standard OLS estimation can be applied and standard tests remain valid. In the case where the threshold parameter ($\hat{\gamma}$) is unidentified, then the threshold estimation process can be carried out by grid searching over the threshold variable, which involves the minimization problem for the following function:

$$\hat{\gamma} = \underset{\gamma \in \Gamma}{\operatorname{argmin}} S_i(\gamma) \quad (8.10)$$

Where $S_i(\gamma)$ is the OLS estimates for the sum of squared errors associated with each value of γ , whereas Γ is a grid set of values that γ might take after excluding the extreme percentage of the observations. Subsequently, $\hat{\gamma}$ is the threshold value that minimizes the sum of squared errors along the grid.

In practical, Hansen approach advanced in (1999) has been adopted to achieve the minimization of equation (8.10). First, the observations of the threshold variable are sorted. Second, the threshold search has been limited to a specific percentage or quantiles of the observations (between $\eta\%$ and $(1 - \eta)\%$) by removing the smallest and largest ($\eta\%$) quantiles (following the standard literature $\eta = 15^{\text{th}}$, so the threshold

search is limited within 15th and 85th percentiles). Hence, a minimal percentage of observations are guaranteed in each model. On this basis, from one hand the number of regressions implemented is reduced extensively. On the other hand, guarantee that the estimation for all regimes remain possible. In other words, avoid any undesirable threshold, in which too few numbers of observations were selected in one model compared with the other one. Third, equation (8.10) and the sum of squared residual are estimated for each quantiles. Finally, the threshold is determined based on the smallest value of the sum of squared residual.

8.2.3 Testing for the Number of Thresholds

In the context of non-linear regression models, some model might have multiple thresholds. Therefore, it's very important to test for the significant of the threshold effect and/or the number of thresholds included in the model (n). In ARDL model, it might be either no threshold, one threshold, or multiple thresholds. As a result, Hansen (1999) proposed the following likelihood ratio test to evaluate the significant of a linear restrictions of short and long-run parameters, where the likelihood ratio test compares the two nested model specifications through evaluating the significant of the constraints in the restricted model compared with the unrestricted model. In other words, testing the null hypothesis of non-threshold ($H_0: n = 0$) against the alternative of one threshold ($H_1: n = 1$), as follow:

$$F_1 = \frac{S_0 - S_1(\hat{Y})}{\hat{\sigma}^2} \quad (8.11)$$

Where S_0 , is the sum of squared errors from the linear symmetric ARDL model, while $S_1(\hat{Y})$, and $\hat{\sigma}^2$ are the residual sum of squares and variance estimated from the single-threshold ARDL model, respectively. Even though, F_1 has a nonstandard asymptotic distribution as a result of unidentified threshold estimator (known as ‘Davies Problem’- see (Davies, 1987)), the null hypothesis can still be tested using Chi-Square asymptotic distribution³⁰. Given that, under the null hypothesis the likelihood ratio test is distributed as Chi-Square with degree of freedom equal to the number of constraints in the restricted model. Once the test statistic exceeds the critical value, the null hypothesis

³⁰ An alternative procedure to test for the threshold effect significant (number of thresholds) has been proposed by Hansen (1999, 2000) and Greenwood-Nimmo et al., (2011) in which asymptotic valid P-value is estimated using bootstrapping approach.

of non-threshold is rejected in favour of one threshold, and further investigation is required to test the null hypothesis of one threshold against the alternative of two thresholds contained in the model based on the following likelihood ratio test:

$$F_2 = \frac{S_1(\hat{Y}_1) - S_2(\hat{Y}_2)}{\hat{\sigma}^2} \quad (8.12)$$

Where $S_1(\hat{Y}_1)$ and $S_2(\hat{Y}_2)$ are the minimized sum of squared errors obtained from single and double threshold RADL models, respectively. In the case of estimating multiple unknown thresholds in the model, Greenwood-Nimmo underscores that “the best method of estimating multiple unknown thresholds is to search for them simultaneously and select whichever set is associated with a global inferiorum of the sum of squared residuals of OLS estimation of the asymmetric ARDL model”(Greenwood-Nimmo et al., 2011, p. 10). Alternatively, Hansen (1999) recommends searching for it sequentially through estimating the first threshold in the first step, then setting its value and start searching for the next threshold, and finally re-evaluate the value of the first threshold .

8.2.4 Estimating the Threshold Confidence Intervals

Moreover, Hansen (2000) indicates that the estimated threshold (\hat{Y}) is consistent with the true value (Y_0). However, the threshold asymptotic distribution is more likely to be non-standard. One way to come over this problem and be able to test the null hypothesis ($H_0: Y = Y_0$), through estimating the non-rejection region for the estimated threshold, and hence forming asymptotically valid confidence intervals based on the likelihood ratio test statistic:

$$LR_1(Y) = \frac{(S_1(Y) - S_1(\hat{Y}))}{\hat{\sigma}^2} \quad (8.13)$$

Where $S_1(Y)$ is the sum of squared errors for a set of values of Y , and $S_1(\hat{Y})$ is the sum of squared residuals of the estimated threshold (\hat{Y}). Therefore, the null hypothesis ($H_0: Y = Y_0$) can't be rejected at the significant level (α), if the likelihood ratio statistic is less than the critical value ($LR_1(Y) \leq c(\alpha)$)³¹. On this basis, the non-rejection region can be delineated by all values of (Y) where the null hypothesis can't be rejected.

³¹ According to Hansen (2000), it's very easy and straight forward to estimate the critical values for different levels of significant using the following formula:

$$c(\alpha) = -2\log(1 - \sqrt{1 - \alpha})$$

Consequently, the corresponding critical value for 10% significant level is 5.94, and 5% is 7.35, while 1% is 10.59.

8.3 Data Sources and Variables Construction

In this section data sources and variables definition will be briefly discussed. A perfect measure for financial structure does not exist in the literature. Hence, financial structure ratio has been used as a proxy that combines both banks and stock markets indicators in one measure. Following the literature, financial structure ratio is estimated by activities of stock market relative to that of banks. A growing body of literature examines the financial system structure (see for e.g., Levine, 2002, Levine et al., 2000a, Levine and Zervos, 1998b) suggest using financial system activity indicators, as a robust predictor for long-run economic growth rate, rather than using pure size indicators of the financial system. Moreover, Allen et al. (2006) argue that stock market capitalization ratio is not a good proxy for the significant of the stock market inside the economy since its extremely affected by the changes and volatility of stock prices. To this end, the total value traded and the private credit ratios have been used as an indicator of stock market and banks activities, respectively.

Hence, financial structure ratio is constructed to reflect the degree to which the country's financial structure is comparatively bank-based or market-based; higher values of financial structure ratio indicate more dominated market-based financial system, whereas small values show more dominated bank-based financial system. Where the stock market activity measured by the total value traded ratio which equal the total value of domestic shares traded in the domestic financial market over the GDP. While, the banking activities represented by the private credit ratio which equal the total value of bank credits to the private sector over the GDP after excluding the credit to the public sector.

Following the literature the logarithm of real GDP per capita is used as indicator for the economic development. Data have been collected from International Financial Statistics (IFS), and Arab Stock market database, Egyptian Capital Market Authority (ECMA); Annual Report, Various Issues, and Arab Monetary Fund (AMF); Arab Stock Markets Database. The sample covers the period from 1980 until 2011.

8.4 Model Specification

From the empirical literature review on finance and growth nexus, a positive relationship is expected between financial structure and economic development. In

particular, the new structural view postulates a strong relationship between banking sector development and economic growth rate in early stage of economic development. On the contrary, the association between stock market and economic growth is more likely to be stronger in the advanced stages of economic development. Thus, we expect that country's financial structure to vary over the time, since it is influenced by the demand for financial services from the real sector which evolves and develops over the path of economic development. Based on the literature review, the empirical analysis of the relationship between financial structure and economic development could be examined using the following general model:

$$FS = f(lypc^+, lypc^-) \quad (8.14)$$

Where, FS indicates the financial structure ratio. $lypc^+$ and $lypc^-$ are the partial sum decomposition processes of positive and negative changes in the natural logarithm of real GDP per capita.

8.5 Empirical Results

In this section, symmetric ARDL model has been presented as a benchmark model to estimate the relationship between financial structure and economic development. Subsequently, asymmetric ARDL approach has been introduced to relax the symmetry assumption and simultaneously investigate both short and long-run asymmetric relationship between financial structure and economic growth.

8.5.1 The Baseline: Symmetric ARDL Model

To start with, restricted linear ARDL model of the form of equation (8.7) has been employed to regress financial structure on a constant, and Real gross domestic product per capita (RGDPPC) as an indicator for the level of economic development. Given that, ARDL approach can be applied to estimate the model and test the hypotheses irrespective of the variables orders of integration are I(1) and/or I(0). It's of a more important to examine the univariate stationary property of the time series variables to assure that all the time series variables under consideration are I(1) and/or I(0) and that there is no I(2) variables were included in the model. Ouattara (2004) indicates that the inclusion of I(2) variables invalidated the computed F-statistics from bounds cointegration test advanced by Pesaran et al. (2001) as its violate the key assumption that all variables under examination should be I(0) and/or I(1).

Table 8.1. ADF Unit Root Test Results

	Optimal Lag	Test Statistics	t-Statistic	Prob.*
Variables in levels				
<i>FS</i>	4	-1.772	-3.587	0.69
<i>lypc</i>	1	-3.098	-3.568	0.12
Variables in 1 st Diff.				
ΔFS	3	-5.733*	-2.976	0.00
$\Delta lypc$	0	-3.901*	-2.963	0.00

Note: the optimal lag length of ADF test has been chosen based on Schwarz Bayesian Criterion (SBC). The critical values are 95% significant level. * indicates significant at 5% level.

Therefore, Augmented Dickey Fuller (ADF) test (1979) has been applied to make sure that there is no variables integrated of order two, I(2), or higher were included in the model. Results of the ADF test in Table 8.1 disclose that the underlying variables are non-stationary in their levels, however they turn out to be stationary after taking the first differences at 5% significant level. Consequently, ARDL approach can be applied to estimate the model and test for long-run cointegration hypothesis between variables. Based on the fact that the true order of the ARDL (p, q) model is not known prior to the estimation, so various ARDL (p, q) models have been estimated using different combinations of ($p = 1, 2, \dots, 5$) and ($q = 0, 1, 2, \dots, 5$), that is 30 different ARDL models. Consequently, Schwarz criterion, SC, has been used to select the optimal lag structure for the ARDL model before performing the estimation and deriving inferences, namely ARDL (4, 0).³² Thereafter, general to specific approach has been applied in order to select the final specification of the ARDL model. More practicality, we start with the previous model, and successively eliminate the variables with the highest p-value (greater than 5% significant level) until we get the final ARDL model whose variables are all statistically significant at 5% level. Furthermore, Newey-West method has been used to generate Heteroskedasticity and Autocorrelation-Consistent (HAC) Standard Errors to ensure that the standard errors are robust. Thereby, the inferences remain valid even in the presence of both arbitrary autocorrelation as well as heteroskedasticity.

³² ARDL model which order has been chosen based on SC Criterion is performing much better than that has been selected depending on AIC Criterion. Since, SC criterion is a consistent model selection criterion whereas AIC is not (Pesaran and Shin, 1998). Therefore, SC is used to determine the augmentation order of ARDL model.

The linear ARDL model results in Table 8.2 indicate that the majority of the coefficients at the model are insignificant.³³ This, in turn, gives a clear signs for model mis-specifications. Furthermore, the long-run cointegrating relationship between financial structure and economic development has been tested using bounds testing approach based on F-test to examine the null hypothesis of no cointegrating relationship between variables. In other words, testing whether the parameters of the lagged level variables are jointly insignificant and equal to zero or not.

Table 8.2. Dynamic Symmetric ARDL Model

Dependent Variable: ΔFS			
Variable	Coefficient	Std. Error	t-Statistic [Prob.]
Const.	-1.834	1.434	-1.279 [0.21]
FS_{t-1}	-0.082	0.127	-0.647 [0.52]
$lypc_{t-1}$	0.232	0.185	1.253 [0.22]
ΔFS_{t-1}	0.569*	0.147	3.862 [0.00]
ΔFS_{t-4}	-1.055*	0.231	-4.557 [0.00]
$\Delta lypc$	2.224	1.172	1.897 [0.07]
Long-run Coefficients:			
L_{lypc}	2.809	2.882	0.949 [0.32]
Diagnostic Tests:			
R^2	0.80	Adj. R^2	0.75
x^2_{SC}	4.88 [0.08]	x^2_H	20.36 [0.00]
x^2_N	1.77 [0.41]	x^2_{RESET}	0.926 [0.33]

Note: FS and $lypc$ indicates the financial structure ratio and the natural logarithm of the real gross domestic product per capita. L_{lypc} is the estimated long-run coefficient defined as $\hat{\beta} = -\hat{\theta}/\hat{\rho}$. Furthermore, x^2_{SC} , x^2_N , x^2_H , and x^2_{RESET} are LM tests for serial correlation, normality, heteroscedasticity, and functional form (Ramsay's RESET test), respectively. Associated p – values are reported in square parentheses [.]. * denotes significant at 5% level.

Indeed, the results in Table 8.3 provide strong evidence in favour of non-rejecting the null hypothesis of no cointegrating relationship between financial structure and economic development, where the value of computed F-statistics (0.959) is less than the lower bound critical value (4.94). One reason for the failure to detect the cointegration

³³ This model has been attained either by starting with a large number of lags (4) then applies general to specific approach or choosing the model based on SC criteria and then applies general to specific approach.

relationship between variables could attribute to the fact that the model is mis-specified and the existing relationship between financial structure and economic development is non-linear rather than linear.

Table 8.3. Bounds Test for Cointegration in Symmetric ARDL Model

Test Statistic	F-statistic [Prob.]	95% lower bound	95% upper bound
F_{PSS}	0.959 [0.399]	4.94	5.73

Note: F_{PSS} statistic testing the null hypothesis of no cointegration, that is, $\rho = \theta = 0$. Pesaran, Shin and Smith (2001) report the lower and upper bounds of 5% critical values for $k = 1$.

Given the profound evidence of significant ARDL model mis-specifications, the reliability and validity of the results and testing hypotheses are dubious. Indeed, these results provide strong evidence that the estimated relationship between financial structure and economic development in linear ARDL model is extremely misleading, while the existing relationship is more likely to be non-linear. To this end, non-linear (asymmetric) ARDL model has been estimated and presented in the next section.

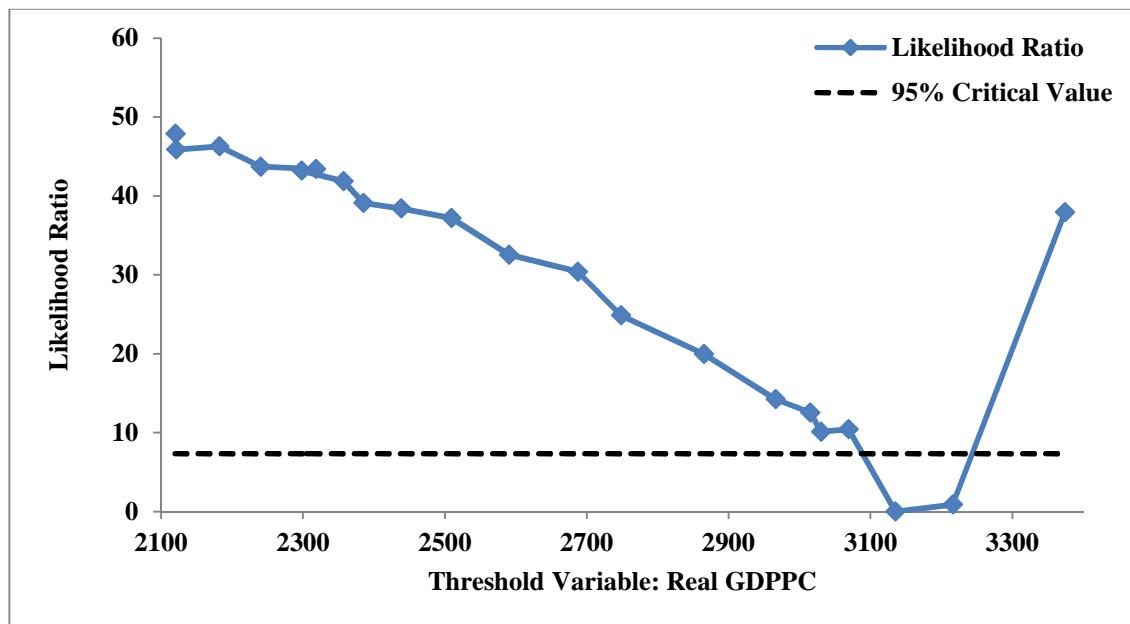
8.5.2 Asymmetric (Threshold) ARDL model

In this section, the non-linear ARDL model is used to simultaneously estimate asymmetries long-run and short-run relationship between financial structure and economic development. Therefore, Real GDPPC is used as a threshold variable to identify the threshold. Then, the non-linear ARDL models in the form of equation (8.5) have been estimated by OLS. Indeed, the threshold identification process is carried out by searching for the smallest value of the residuals sum of squared over the 70% percentiles of Real GDPPC (following the standard literature to cut at 15th and 85th percentiles). On this basis, results indicate that the threshold value of the real GDPPC that minimizes the sum of squared errors along the grid is 3135 in the case of Egypt. Thereafter, Hansen test (1999) has been applied to check the significant of the threshold effect by means of testing the null hypothesis of non-threshold against the alternative of one threshold. In other words, the null hypothesis of significant linear ARDL model is tested against the non-linear ARDL model. Results show that F-statistics for a single

threshold is (64.2), which is highly significant and exceeds the corresponding Chi-Square critical value (5.99) at 5% significant level.³⁴

Finally, to test that the estimated threshold (\hat{Y}) is consistent with the true value (Y_0), Hansen likelihood ratio test (2000) is used to test the null hypothesis ($H_0: \hat{Y} = Y_0$) and form asymptotically valid confidence intervals for the estimated threshold. Figure 8.1 exhibits the normalized Likelihood ratios as a function of the threshold variable (real GDPPC), where the threshold estimates is the point at which the likelihood ratio curve intersect with the horizontal axis, equal zero, which exist at 3135. The 95% critical value is 7.35³⁵ which present by a straight dotted line. As a result, the corresponding asymptotic 95% confidence interval can be easily depicted from the points where the likelihood ratio curve intersects with the dotted line, that is (3088: 3242).

Figure 8.1. Threshold Confidence Interval



Source: Author calculations.

Subsequently, it can be concluded that there is strong evidence that there is one threshold in the ARDL model. In other words, the non-linear ARDL form is much better than the linear ARDL in formulating the relationship between financial structure

³⁴ The null hypothesis of non-threshold can be tested against the alternative using Chi-Square test with degree of freedom equal to the number of restrictions (2).

³⁵ Reported in Hansen (1999, 2000).

and economic development. Based on these results, the reminder of the analysis will be conducted based on one-threshold ARDL model (TARDL).

The estimation of the asymmetric ARDL model is presented in Table 8.1 in which the majority of the parameters are statistically significant. The long-run coefficient of financial structure in the upper regime is negative (-0.382) compared with positive coefficient (0.409) in the lower regime. However, statistically significant long-run effect is observed only in the lower regime (L_{lypc}^-).

Table 8.4. Asymmetric Estimation of ARDL Model

Dependent Variable: ΔFS			
Variable	Coefficient	Std. Error	t-Statistic [Prob.]
Const.	-2.442*	0.714	-3.416 [0.00]
FS_{t-1}	-0.773*	0.154	-5.002 [0.00]
$lypc_{t-1}^+$	-0.296	0.528	-0.560 [0.58]
$lypc_{t-1}^-$	0.316*	0.092	3.418 [0.00]
ΔFS_{t-1}	0.379*	0.098	3.850 [0.00]
ΔFS_{t-3}	0.980*	0.126	7.728 [0.00]
$\Delta lypc^+$	12.65*	0.835	15.14 [0.00]
$\Delta lypc^-$	1.219	0.671	1.814 [0.08]
Long-run Coefficients:			
L_{lypc}^+	-0.382	0.756	0.256 [0.61]
L_{lypc}^-	0.409*	0.082	24.44 [0.00]
Diagnostic Tests:			
R^2	0.95	Adj. R^2	0.93
x_{SC}^2	4.96 [0.08]	x_H^2	13.58 [0.05]
x_N^2	2.96 [0.22]	x_{RESET}^2	4.610 [0.03]
W_{LR}	1.665 [0.19]	W_{SR}	162.2 [0.00]
F_{PSS}	151.9 [0.00]		

Note: the superscripts “+” and “-” indicates positive and negative partial sums of real GDPPC ($lypc$), respectively. L_{lypc}^+ and L_{lypc}^- are the estimated long-run coefficient associated with positive and negative changes in $lypc$ and defined as $\hat{\beta}^+ = -\hat{\theta}^+/\hat{\rho}$ and $\hat{\beta}^- = -\hat{\theta}^-/\hat{\rho}$. Furthermore, W_{LR} demonstrates the Wald statistics for testing the null hypothesis of long-run symmetry relationship $L_{lypc}^+ = L_{lypc}^-$. While, W_{SR} refers to Wald test for the null hypothesis of symmetric short-run additive relationship. Finally, F_{PSS} statistic testing the null hypothesis of no cointegration, that is, $\rho = \theta^+ = \theta^- = 0$, and the associated critical values are 4.94 and 5.73 with k=1 at 5%. Associated p -values are reported in square parentheses [.]. * denotes significant at 5% level.

Turning to the analysis of the cointegration relationship, Bounds cointegration test based on asymmetric ARDL model is firmly rejected the null hypothesis of no cointegrating relationship between variables at 5% significant level. More particularly, F_{PSS} statistic (151.9) exceeds the upper-bound critical value (5.73).³⁶ This, in turn, reveals the existence of statistically significant long-run relationship between financial structure and economic development.

Moving to the analysis of long and short-run asymmetry, no evidence of long-run asymmetry relationship is detected in the model, since Wald test fail to reject the null hypothesis of long-run symmetry indicating that the relationship between financial structure and economic development is more likely to be linear in the long-run. On the other hand, Wald test firmly rejected the null hypothesis of additive short-run symmetry relationship between variables at 5% significant level. In particular, the Wald statistics for long-run symmetry is found to be (1.07) with P-value equal (0.29), corresponding to (162.2) with P-value (0.00) for the short-run symmetry. Therefore, these findings suggest that the preferred specification should combine long-run symmetry in line with short-run asymmetry relationship in the NARDL model.

8.5.3 The Preferred model: Long-run Symmetry and Short-run Asymmetry

The final results of the preferred model in Table 8.5 reveal that the cointegration test is firmly rejecting the null hypothesis of no cointegration relationship between financial structure ratio and economic development, where the estimated long-run coefficient is statistically significant at 5%, indicating that economic development pass changes through to financial structure ratio symmetrically in the long-run. In particular, there is a positive long-run relationship between financial structure ratio and economic development, an economic upturn of 2.5% will increase the financial structure ratio by 1 percentage point and vice versa. Moving on to the short-run dynamic asymmetry, Wald test strongly reject the null hypothesis of symmetric short-run, where the short-run coefficient in the upper regime is of a more plausible magnitude than in the lower regime. Indeed, the estimated short-run parameters to a unit shock in the upper regime

³⁶ Following Shin et al. (2011), we adapted the conservative approach and select the critical values on the basis of the number of regressors included in the long-run relationship prior to their decomposition into positive and negative partial sums.

(when $lypc^+ \geq 3135$) is 12.6% compared with 1.41% to a unit shock in the lower regime (when $lypc^- < 3135$), respectively. In other words, an economic increase of 0.08% in the upper regime is necessary to increase the financial structure ratio by 1 percentage point corresponding to an increase of 0.7% in the lower regime. In fact, lower levels of economic development have trivial and insignificant impact on financial structure. Conversely, at high levels of economic development (upper regime) the financial system is shifting very fast (nine fold) towards a market-based rather than bank-based. In other words, over time the stock market has become of more significant and important relative to the banking sector.

Table 8.5. Long-run Symmetry and Short-run Asymmetry ARDL Model

Dependent Variable: ΔFS			
Variable	Coefficient	Std. Error	t-Statistic [Prob.]
Const.	-2.757*	0.627	-4.394 [0.00]
FS_{t-1}	-0.894*	0.071	-12.44 [0.00]
$lypc_{t-1}$	0.357*	0.080	4.413 [0.00]
ΔFS_{t-1}	0.495*	0.040	12.37 [0.00]
ΔFS_{t-3}	0.961*	0.140	6.865 [0.00]
$\Delta lypc^+$	12.60*	0.751	16.78 [0.00]
$\Delta lypc^-$	1.419	0.727	1.951 [0.06]
Long-run Coefficients:			
$lypc$	0.40*	0.071	31.50 [0.00]
Diagnostic Tests:			
R^2	0.94	Adj. R^2	0.93
x_{SC}^2	3.836 [0.14]	x_H^2	16.00 [0.01]
x_N^2	0.134 [0.93]	x_{RESET}^2	0.752 [0.38]
F_{PSS}	97.99 [0.00]	W_{SR}	142.0 [0.00]

Note: the superscripts “+” and “-” indicates positive and negative partial sums of real GDPPC ($lypc$), respectively. $lypc$ is the estimated long-run. Furthermore W_{SR} refers to Wald test for the null hypothesis of symmetric short-run additive relationship. Finally, F_{PSS} statistic testing the null hypothesis of no cointegration, that is, $\rho = \theta = 0$, and the associated critical values are 4.94 and 5.73 with $k=1$ at 5%. Associated p – values are reported in square parentheses [.]. * denotes significant at 5% level.

8.6 Summary and Conclusions

This chapter investigates the validity of the new structuralism hypothesis that highlighting a dynamic relationship between country's financial structure and phase of economic development using the most recent econometric technique, namely Non-linear ARDL model advanced by Shin et al. (2011).

The main findings from our empirical analysis could be summarised in the following points. Firstly, financial structure matter for economic growth. Secondly, Market-oriented financial systems are correlated positively with high level of economic development. Thirdly, there is a threshold effect in the financial structure model. In other words, both banks and stock market are important in early stage of economic development. However, overtime the importance of stock market relative to banking system becomes more significant. These results are in line with (Tilly, 1967, Chandler, 1977, Gerschenkron, 1962, Rajan and Zingales, 1998a, Rajan and Zingales, 1998b, Rajan and Zingales, 2003a, Allen et al., 2006, Demirguc-Kunt et al., 2011) and the new structuralism view proposed by (Lin et al., 2009, Lin, 2011, Lee, 2012). Furthermore, Bolbol et al. (2005) investigates the link between financial structure and Total Factor Productivity (TFP) in the case of Egypt over the period 1980 to 2002. His empirical results indicate a positive association between the ratio of financial structure and the TFP growth. Furthermore, both the Egyptian banking sector and the stock market have contributed positively to the TFP growth. However, the impact of the stock market is larger and more pronounced compared with the banking sector effect.

Accordingly, country's financial structure will be changing over time, since it is influenced by the demand for financial services from the real sector which evolves and develops over the path of economic development as more capital accumulation and resources take place. In other words, different structures of the real sector and industries have different firms and projects with various types of risk, size, and financial needs. Therefore, dynamic change in the real sector at different stages of economic development creates the demand for different types of financial instruments, contracts and institutions. Consequently, particular types of financial system structure will exist and be more efficient than others in managing particular types of risk, matching savings with investment, promoting resources allocation efficiency and spur economic growth at particular point of time and stage of economic development.

This findings stress the importance of financial structure as a key dimension of financial policy consideration. This suggests that the institutional structure of the financial sector and its financial policies should be adjusted as the economic development taking place. In early stage of economic development, both banking system and stock market are increasing over time. However, the importance of stock market relative to banking system becomes more significant as development proceeds.

Demirgüç-Kunt and Levine (1999) indicate that there is a positive correlation between financial structure ratio and richer countries. That is, advanced economies tend to have a market-based financial system. This could be explained based on our analysis by the change and evolve of the real economy through the pass of economic development.

9 Conclusions, Policy Recommendations and Future Research

9.1 Introduction

The Egyptian government sought to achieve rapid growth by adopting the financial development and liberalisation programmes of the types prescribed by the international institutions such as the World Bank (WB) and the International Monetary Fund (IMF). Since the domestic financial system plays a significant role in financing investment and, hence, in promoting economic growth, it is argued that developing countries should develop and liberalise fully their financial systems in order to catch-up with the advanced economies and to achieve rapid growth. A well-functioning domestic financial system accelerates the economic growth through mobilising savings; allocating these savings efficiently into the most productive projects; providing risk diversifications; and easing the flow of trade inside the economy.

By using different time series techniques over the period from 1980 to 2011, this thesis investigated the relationship between finance and growth in developing countries and, particularly, in the case of Egypt. More precisely, in order to address the main research question, the thesis has three main empirical chapters which examine three different aspects but interrelated dimensions of the finance-growth nexus. The first empirical chapter investigated the relationship and causality direction between financial development and economic growth. The second empirical chapter explored the link between financial liberalisation and economic growth based on McKinnon's complementary hypothesis. The third empirical chapter examined the validity of the new structuralism hypothesis regarding the relationship between financial structure and economic development.

This chapter aims to provide a summary and conclusions of the empirical analysis carried out in the study. Furthermore, this chapter highlights the thesis' contributions to the existing literature on finance and growth and presents the policy implications derived from the empirical analyses. Then, there is a discussion of the limitations of the thesis and suggestions for future research. Therefore, the remainder of this chapter is structured as follows. Section 9.2 summarises the thesis' main findings as reported in the three empirical chapters. Section 9.3 presents the thesis' main research contributions

whilst section 9.4 discusses the policy implications. Then, section 9.5 highlights the limitations of the thesis and, finally, section 9.6 offers potential avenues for future research in the area of finance and growth.

9.2 Main Findings of the Thesis

This study's general objective was to examine intensely the relationship between finance and growth in developing countries with particular reference to Egypt. Each of the empirical chapters investigated one aspect of this relationship. Hence, the following subsections report the main findings of the three empirical chapters.

9.2.1 Financial Development and Economic Growth

In recent years, there have been extensive theoretical and empirical debates on the role of financial development in promoting economic growth. However, conflicting results from various empirical studies at different levels, country group and specific country studies, using several econometric techniques, did not help to reach a concrete conclusion. Indeed, the empirical results are ambiguous and vary according to the measures of financial development; function form; estimation method; and data frequency.

Empirical chapter 6's key objective was an investigation of the relationship and the causality pattern between financial system development and economic growth which, in the case of Egypt, was of paramount importance to policy makers. In particular, did the causal relationship run from financial development to economic growth and/or did it run from economic growth to financial development?

To this end, different proxies of financial development were employed to investigate this relationship. With regard to the banking sector, three variables were utilised. Namely, these were: the liquid liabilities ratio; the private credit ratio; and the ratio of deposit money bank assets to total financial assets. For the stock market, we used these three variables: capitalization ratio; total value traded ratio; and turnover ratio. These measures reflected the development of different aspects of the banking sector and of the stock market, namely, size; liquidity; and activities.

Empirical results, from the Johansen co-integration test, indicated the existence of a unique co-integrating relationship between the logarithm of real GDP and the proxies of financial development. In the case of Egypt, the long-run co-integrating vector pointed

out that, rather than the banking sector, the development of the stock market was more conducive to a higher rate of growth. This finding was in line with that of Bolbol et al. (2005). In the case of Egypt, he pointed out that, rather than bank-based indicators, market-based measures had a more pronounced influence on TFP growth.

Subsequently, the examination of the causality pattern between financial development and economic growth was based on a Vector Error Correction Model (VECM) in both the short-run and the long-run. The results showed that, whilst, in the long-run, there was a consistent causality pattern which supported the demand-following view that economic growth promoted higher financial development, in the short-run, the causality pattern provided mixed results. Kar et al. (2011) showed that, in the MENA countries, the direction of causality between financial development and economic growth was sensitive to the choice of financial development indicator. Therefore, the direction of causality seemed to be specific to country and financial development indicator.

Although the empirical analyses indicated that, in Egypt, the causality between financial development and economic growth was very sensitive to the way in which the financial development was measured, the demand-following pattern tended to be more predominant. These results were consistent with findings from some developing countries whereas less-developed economies, with less sophisticated and under developed financial systems, tended to provide evidences in favour of the demand-following view.

Additionally, the causality pattern showed a bilateral relationship between banking sector development and stock market development. This common result seemed to be interesting in terms of the financial structure literature and the on-going debate of bank-based financial system versus market-based. In other words, this finding supported the financial services view that, rather than substitutes for each other, the banks and the stock market were more likely to be complementary; it was not a matter of a bank-based or a market-based financial system. However, the overall provision of financial services was more crucial and more significant in promoting the economic growth. Banks and financial markets are different components of the financial system and provide different financial services. Whereas, banks are better at easing the transaction cost and informational asymmetry, associated with market imperfections; and spurring collateralized investment and low risk management; stock markets provide long-term

commitments; finance high risk projects; and offer a higher degree of risk diversification.

9.2.2 Financial Liberalisation and McKinnon's Complementary Hypothesis

Following the results from the first empirical chapter (chapter 6), chapter 7 (the second empirical chapter) extended the analysis by examining, in the case of Egypt, the impact of financial liberalisation on savings and investment and, hence, the rate of economic growth rate. This chapter focused on the financial regulations and policies which were followed through the implementation of Economy Reform and the Structural Adaptation Program (ERSAP) prescribed by the World Bank and the International Monetary Fund. It focused, also, on how these new trends in managing the Egyptian economy affected the performance of the financial system and economic growth. Generally speaking, this chapter investigated the validity of McKinnon's complementary hypothesis by using an extensive data set and bounds co-integration test within an ARDL econometric technique.

McKinnon (1973) argued that, in developing countries, there was a complementary relationship between money and physical capital accumulation. Investment is constrained by savings and the availability of funds rather than the cost of borrowing. Hence, financial liberalization policies induce public and households to increase their savings which on the one hand, encourage and boost the financial intermediation process and, on the other hand, accelerate the supply of loanable funds available to the private sector.

In general, on the one hand, the empirical findings indicated that, in the case of Egypt, McKinnon's complementary hypothesis did not hold and, on the other hand, they emphasised the neoclassical view of a substitution relationship between real money balances and capital accumulations. Consequently, an increase in the real return on money stimulates the demand for real money balances which, in turn, has detrimental effects on investment and the capital accumulation process.

Furthermore, the results indicated that development of the financial system did lead to larger financial systems which contributed positively to savings, investment and economic growth. However, through affecting adversely banks, investors and

household's behaviours inside the economy, financial liberalisation and deregulation may have different effects on real money balances and on savings and investment.

By removing entry barriers and allowing private and foreign financial institution ownership, financial reform policies increase the number of financial institutions; improve competition in the capital markets; and offer several forms of money substitutes such as ATMs, credit cards and electronic money transfers. As part of the financial reform programme, these types of financial innovations improve the liquidity services provided by the banking sector and offer substitutes for traditional money (currency) and demand deposits which, in turn, reduce the transactions demand for money. Furthermore, on the one hand, by increasing households' access to credit through easing credit constraints on households and stimulating the expansion of mortgage and consumer credit markets, financial liberalisation policies have detrimental effects on savings and the rate of economic growth rate. On the other hand, through private credit misallocation in favour of households rather than loans to firms and businesses, these financial deregulations can reduce the funds available to the business sector. However, data on the allocation of private credit between households and business sector is needed in order to investigate further the validity of this proposition. Currently, in the case of Egypt, this information is unavailable. These findings, related to financial development and financial liberalisation, were in line with Hussain (1997). Although, in the case of Egypt, financial development is associated positively with real GDP per capita, his empirical results did not support the financial liberalisation hypothesis that a higher real interest rate would have a positive impact upon investment and economic growth. In the same vein, Frangakis (2009) examined the main elements of financial sector deregulation programmes in the context of European countries. She indicated that, without sufficient preparation, financial deregulation policies stimulated the extension of financial systems which led to credit booms; financial instability; and fragility which had detrimental effects on investment and the capital accumulation process. This is particularly true given the potential negative impact of stock markets on economic development due to high volatility and speculation processes coupled with financial liberalization policies.

On the one hand, the development of the financial market and a large volume of activities offer not only a new channel for corporations to raise capital and finance investments but, also, great opportunities for speculative activities and trading of

existing securities rather than financing new projects and physical investment. This means that liquidity is made available for speculative purposes rather than productive resources and, therefore, has a negative impact on investment and capital accumulation. On the other hand, increasing financial system competition, through removing entry barriers for domestic and foreign banks, encourages the proliferation of financial institutions which, in turn, leads to unbalanced portfolios and accumulates non-performing loans in the banking sector. In 1996, this was the case in the Philippines.

Furthermore, compared to small and medium enterprises (SMEs), large corporations and the business elite obtain more benefits from the financial liberalisation programme in Egypt. This is achieved, firstly, through the extension of capital resources allocation and preferential credit supply to the private sector and, secondly, by changing the ownership and structure of the financial system through appreciation of private and foreign banks ownership and the development of the stock market. Simply, these blocked the small and medium enterprises (SMEs) from obtaining sufficient credit from the financial system. Therefore, at the expense of other groups, entrepreneurs, who are well connected politically, have unrestricted access to credit from the financial system. Consequently, these entrepreneurs enjoy a disproportionate amount of the financial reform programmes

9.2.3 Financial Structure and Economic Development

Chapter 8 (the third empirical chapter) explored the relationship between financial structure and economic development. In particular, this chapter examined whether the financial structure was stable or dynamic and determined endogenously by the level of economic development. During the last four decades, there have been many debates concerning the merits of a market-based versus bank-based financial system and whether stock markets and banks complemented each other or were substitutes for each other or whether one was more conducive for the economic growth than the other. However, the theory provided conflicting views regarding the link between the structure of the financial system and economic growth.

Indeed, this was due to the fact that the determinants of the financial structure, such as political conditions; law and legal origins; cultural factors; and the association between the structure of the real economy and the evolution of financial system structure were disregarded and did not receive much attention in the literature. In addition, both types

of financial institutions suffer from inefficiencies and neither a pure form of a bank-based nor a market-based financial system exists in the real world. Therefore it is very difficult to reach an agreement or adequate explanation regarding the existence of different financial structures between countries and to conclude that one type of the financial structure is better off than the other. In contrast, large numbers of empirical papers argued that the structure of the financial system was irrelevant and did not matter for economic growth. Indeed, what mattered for the economic growth was the overall level of financial development.

Another strand of the literature emphasised the new structuralism approach. This strand argued that a country's financial structure would be dynamic and would change over the path of economic development since it was influenced by the demand for financial services from the real sector which evolved and developed over time as more capital accumulation and resources took place. In particular, at each stage of economic development based on the comparative advantage approach, the structure of factor endowments determines the corresponding industrial structure of the economy. In turn, the industrial structure determines the corresponding financial structure. Hence, certain types of financial institutions and arrangements are better than others in serving particular industries.

This chapter's central idea was that different structures of the real sector and industries had different firms and projects with various types of risk; size; and financial needs. Therefore, at different stages of economic development in the real sector, dynamic change creates the demand for different types of financial instruments; contracts; and institutions. Consequently, particular types of financial system structures exist and are more effective than others in managing particular types of risk; matching savings with investment; promoting efficient allocation of resources and spurring economic growth at particular points of time and stages of economic development.

Therefore, a financial structure is dynamic and determined endogenously by the demands from the real economy for specific types of financial services which change in response to different stages of economic development inside the economy. At early stages of economic development, the financial structure is more likely to be bank-based and dominated by a large number of small banks which provide their financial services to a large number of small-size manufactures and entrepreneurs. In contrast, at advanced stages of economic development, the financial system is dominated by financial markets.

In other words, as the economic development takes place, the economy enjoys better supervision; a well-functioning legal framework; and informational institutions which are considered to be prerequisites for financial market development.

The main findings, from our empirical analysis, confirmed the new structuralism hypothesis which could be summarised in the following points. Firstly, a financial structure matters for economic growth. Secondly, in the case of the Egyptian economy, a market-oriented financial system is correlated positively with a high level of economic development. Thirdly, there is a threshold effect in the financial structure model. In other words, in early stages of economic development, both banks and the stock market are important. However, as the economic development advances, the stock market's importance, relative to banking system, becomes more significant.

On the one hand, these findings stressed the financial structure's importance as a key dimension of financial policy consideration. On the other hand, the institutional structure of the financial system and its financial policies ought to be adjusted as the economic development takes place. In the early stages of economic development, the size of both the banking system and stock market increase over time. However, the stock market's size, relative to the banking system becomes larger as development proceeds. A large body of empirical studies reported a positive association between the financial structure ratio and developed countries, namely, advanced economies tended to have a market-based financial system. In the light of our findings, this could be explained by the changes and evolution of the real economy through the passage of economic development since countries, with an advanced level of economic development, tended to have market-based financial systems.

Overall, from the results of the three empirical (chapter 6, 7 and 8) it can be concluded that finance is conducive to more economic growth. The development of both the banking sector and the stock market contribute positively to the level of saving and investment and, hence, the economic growth. However, as such, financial liberalisation might have a detrimental effect on savings and investment. Furthermore, when designing the appropriate financial policy, monetary authority and policy makers should take into consideration the level of economic development and the structure of the real economy since certain types of financial institutions and arrangements are better than others in serving particular industries.

9.3 Contributions to the Existing Literature

This study contributes to the empirical literature on finance and growth by identifying and filling the gap in the literature. These can be listed in the following points:

- (i) Chapter 6 contributes to the existing literature on financial development and economic growth by two aspects. Firstly, this empirical chapter was the first to investigate the relationship between financial development and economic growth for Egypt that takes into account the impact of banking sector and stock market and examining them simultaneously. Secondly, theoretical and empirical studies, which, in the case of Egypt, investigated the relationship between financial development and economic growth, were occasional and insufficient. The theoretical studies were limited to descriptive analysis whereas the empirical studies were subject to a number of deficiencies such as limited data availability and, consequently, their findings, conclusions and policy implications could be misleading. Therefore, using the most recent available data and accurate measure for financial development based on a principal component analysis in multivariate time series model, this empirical chapter attempted to fill the gap in the literature through examining the finance-growth nexus in the context of Egypt.
- (ii) Chapter 7 explored the relationship between financial liberalisation; savings; investment; and economic growth based on McKinnon's complementary hypothesis. This chapter contributes to the literature in two ways. Firstly, this empirical chapter was the first attempt to investigate the validity of McKinnon's complementary hypothesis in the case of Egypt. Secondly, this chapter investigated two different channels through which financial liberalisation could impact on the economic growth. Thereby, this chapter utilised two different models in examining the validity of the hypothesis, namely, saving and investment models.
- (iii) By using the most recent econometric technique, namely Non-linear ARDL approach, chapter 8 contributes to the literature by investigating the non-linear relationship between financial structure and economic development. This empirical chapter was the first literature attempt to investigate the relationship between financial structure and economic development which took into account the non-linear relationship between these two variables. Furthermore, in the case

of Egypt, empirical studies, which investigated the relationship between financial structure and economic development were very rare and limited only to Bolbol et al. (2005).³⁷ Therefore, in the context of Egypt, by using the most recent available data and measuring the financial structure accurately in order to examine the link between the financial structure and economic development, this empirical chapter filled the gap in the literature.

9.4 Policy Implications

The following are several policy implications which can be drawn from the empirical chapters. Chapter 6's empirical findings suggest some policy implications regarding the link between financial development and economic growth. These findings indicated that the link between stock market developments and economic growth seemed to be stronger and more pronounced than the link between the development of banking sector and economic growth. Therefore, the government authority and policy makers need to focus and pay more attention to the promotion of the stock market.

Moreover, although the Egyptian financial system has experienced extensive reforms since the early 1990s, there is still a lack of well-developed financial institutions that can provide a wide range of financial instruments which are more sophisticated and allow a high degree of diversification. Furthermore, due to their lack of credit history and the difficulties which banks face in identify the creditworthy SMEs in developing countries, the small and medium enterprises (SMEs) are blocked simply from obtaining sufficient credit from banks. In the meantime, financial markets are concentrated and dominated by large corporations and the business elite who can obtain more benefits from the financial sector.

Therefore, on the one hand, the government should adopt comprehensive regulatory changes which aim to enhance the financial sector through providing a robust institutional framework and encouraging more sophisticated financial instruments with high diversifications which lead to higher investment and economic growth. On the other hand, more prudential regulations and supervision are needed in order to ensure

³⁷ He investigated the link between financial structure and Total Factor Productivity (TFP) in the case of Egypt over the period from 1980 to 2002. His empirical results indicated a positive association between the ratio of financial structure and the TFP growth. Furthermore, both the Egyptian banking sector and the stock market contributed positively to the TFP growth. However, when compared to the effect of the banking sector, the impact of the stock market was larger and more pronounced.

that economic agents and, in particular, small and medium firms have full access to both banks and financial markets.

Chapter 7's empirical findings showed that, although the Egyptian financial system did not contribute significantly to real investment and higher economic growth, the development of the financial system had a positive impact on savings and investment in the country. Thereby, there is a need for better institutional and legal framework and more information disclosure and transparency. During the implementation of financial liberalization programmes, some forms of financial controls might be, potentially, stabilizing tools which, rather than a form of financial repression, might have a positive effect on economic growth and the efficiency of allocating resources. Accordingly, future financial policies should strengthen the legal and institutional environment in order, on the one hand, to enhance operational efficiency in the financial system, and, on the other hand, to encourage policies which spur investment and economic growth rate and repress the demand for money and speculation activities.

Furthermore, new financial institutions will enter the market as the financial liberalisation programme takes place. Consequently, the monetary authority should supervise and monitor the financial sector closely in order to constrain the increasing number of financial institutions and to control the level of competition. This would ensure that financial institutions enjoy economies of scale and are not involved in harmful competition or high risk activities. Since, policies, which achieve macroeconomic stability and strengthen the prudential regulation framework, are considered to be fundamental perquisites for a successful financial liberalisation programme.

More importantly, the thesis has particular relevance for the financial liberalisation programmes prescribed by international institutions. The thesis' theoretical and empirical analyses showed that the relationship between finance and growth was country specific and could not be generalised. Therefore, international institutions, such as the World Bank (WB) and the International Monetary Fund (IMF) should abandon the "one size fits all policy" type of approach which resulted in many financial crises in developing countries.

In general, in order to promote the development of the financial sector and hence economic growth in Egypt, economic policies should aim at enhancing competition and

transparency, minimising corruption, and allowing a wider scope of ownership in the market. These main objectives go beyond merely enacting new laws and regulations that organise the market and promote more competition. To this end, the Egyptian government should develop a comprehensive financial reform plan. This programme should be aimed at introducing efficient, transparent, and dynamic institutions in both private and public sector. The purpose of this new institutional framework is threefold. First, to change the public sector's culture from rent-seeking to one with more efficiency, transparent, and more market oriented - this will ensure that credit relationship is well defined and understood by all economic agents. Second, to increase the bargaining power of the SME inside the economy. This could be done by introducing SME representative organisations through which SMEs can participate in shaping the economic policies and interact efficiently with large corporations. Finally, to coordinate between state, private and civil society institutions to ensure a high degree of consistency between these sectors.

9.5 Limitations of the Thesis

Although the thesis has made several important contributions to the literature, it should be acknowledged, also, that it has a few limitations and drawbacks. As pointed out in chapter 6, most of the financial data, for Egypt, was available only on an annual basis. Therefore, time series data were available for a very short period and, consequently, the size of the sample was limited and small.

Furthermore, this study did not take into account the effects of other external factors, control variables, when addressing the main research questions of the thesis such as the development of bond market; the legal framework; and the economic conditions that might have affected the empirical models. Given the limited available data, the inclusion of control variables increase the number of regressors in the model and, hence, consumed more degrees of freedom. However, the exclusion of relevant control variables might have introduced the problem associated with omitted variables and might have biased the empirical results.

In addition, chapter 8's empirical findings had their own limitations. We acknowledge that this study was a primitive investigation of the relationship between financial structure and economic development and there remain some issues which need further clarification. In particular, case studies, for specific countries, require a sufficient time

horizon in order to reveal the variation in financial structure over time and to be able to test the hypothesis that financial structure evolves over the path of economic development. However, particularly for developing countries, the majority of financial development indicators are available only on an annual basis and for a short time span. Therefore, I recommend caution when interpreting or extending the results outside the sample period or the case study.

9.6 Avenues for Further Research

This study is one of the few studies which, in the case of Egypt, examined in depth the relationship between finance and growth from several dimensions. Although it provides a comprehensive analysis of the relationships between financial development; financial liberalisation; financial structure; and economic growth, this thesis can be extended based on some of the questions arising from the empirical analysis. These provide potential avenues for future research.

One of the major problems, associated with the empirical investigation of the finance-growth nexus, is how to obtain accurate measures of financial development. Following the literature, this study employed several proxies for financial development and financial structure. However, future research could investigate the same research questions by using other measures which are more comprehensive and reflect different aspects and functions of financial system and, then, compare the results in order to establish whether or not the results hold.

Furthermore, due to the issue of available data, this study focused mainly on the development of both the banking sector and the stock market. Therefore, another interesting extension of the study could be to include other financial markets and institutions, such as the bond market, since a well-developed debt market would provide an alternative vehicle through which corporations and investment projects could be financed.

In chapter 7, the negative impact of financial liberalisation on savings and investment was attributed to the misallocation of private credit in favour of households rather than loans to firms and businesses. Unfortunately, there was no available data for the allocation of private credit by sector to enable this issue to be investigated. Therefore, the future availability of data could allow the validity of this proposition to be tested.

Most of the empirical literature on finance and growth imposed a linear relationship between financial development and economic growth without taking into account the possibility of nonlinearity. By using two linear econometrics techniques, namely Vector Error Correction Model (VECM) and the Autoregressive Distributed Lag (ARDL), this study investigated, also, the relationship between financial development, financial liberalisation and economic growth. However, another literature strand indicated the possibility of a nonlinear relationship between finance and growth (Deidda and Fattouh, 2002, Hung, 2009, Murinde, 2012). In addition, nonlinearity is common in macroeconomics variables and associated with many macroeconomic relationships. Therefore, one of the potential questions for future research could be testing the linear versus nonlinear relationship between finance and growth.

Moreover, future research should re-examine the new structuralism hypothesis and, by using large data samples for different countries and different econometric techniques, track the evolution of the financial structure over the path of economic development.

Although over the last decade, the quality of institutions has gained more popularity, there are limited empirical studies which investigated the impact of institutional factor on financial development in developing countries. Consequently, another interesting possibility for future research could be an investigation as to whether or not institutional factors, such as the quality of regulatory and legal enforcement; property rights; control of corruptions; and government effectiveness have a significant impact on the development of the financial sector and, hence, economic growth.

As the finance and growth literature indicated, there is a strong and positive association between financial development; technological innovation; and economic growth. Therefore, another possible path for future research could be to investigate empirically the effect of financial development and R&D on economic growth. Furthermore, in the world economy, Egypt is considered to be one of the low-income countries. Therefore, on the one hand, the role of financial development in easing and reducing poverty and, on the other hand, the impact of financial development on income inequality could be prospective fields for future researches.

Finally, due to the available data, our results were limited to a small number of observations. Consequently, the future availability of data could allow the extension of the empirical investigation to include more control variables. Although you might

continue to obtain different patterns of causality, these could help to give more accurate explanations of the relationship and pattern of causality between finance and growth.

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