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Financial Liberalisation in Nepal

Min Bahadur Shrestha
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Financial Liberalisation in Nepal

A thesis submitted in fulfilment of the requirements
for the award of the degree

Doctor of Philosophy

from



University of Wollongong

School of Economics and Information Systems

Faculty of Commerce

New South Wales, Australia

by

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August 2005

CERTIFICATION

I, Min Bahadur Shrestha, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Economics and Information Systems of the Faculty of Commerce, University of Wollongong, is wholly my own original work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institutions.

Min Bahadur Shrestha

12 August 2005

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ABBREVIATIONS

ADBN	Agricultural Development Bank of Nepal
BCBR	Real Borrowing from Central Bank (by commercial banks)
CAR	Capital Adequacy Ratio
CDR	Credit-Deposit Ratio
CRR	Cash Reserve Ratio
EAL	External Account Liberalisation
ECC	Easing in Credit Controls
FD	Financial Depth (total time deposits divided by GDP)
FLI	Financial Liberalisation Index
FY	Fiscal Year
GDP	Gross Domestic Product
GDPP	Real Per Capita GDP
GDPR	Real GDP
IPR	Implementation of Prudential Rules
IRD	Interest Rate Deregulation
IRR / DRR	Real Interest Rate / Real Deposit Rate
LCDR	Log of the Credit-Deposit Ratio
LFD	Log of the Financial Depth
LGDPP	Log of the Real Per Capita GDP
LG DPR	Log of the Real GDP
LNG DPR	Log of the Real Non-agricultural Sector GDP
LPBB	Log of the Average Population Density per Bank Branch
LPBCIA	Log of the Per Capita Bank Credit to Industry and Agriculture Sector
LR	Lending Rate of Commercial Banks
LRR	Real Lending Rate of Commercial Banks
LSBCP	Log of the Share of Bank Credit to Private Sector in the Total Bank Credit
LSBCPP	Log of the Share of Bank Credit to Poor Population in the Total Bank Credit
LSNGDP	Log of the Share of Non-agricultural Sector GDP in the total GDP

LTBCR	Log of the Real Total Bank credits
LTDR	Log of the Real Time Deposits
LVBT	Log of the Real Total Volume of Bank Transaction
LVBTP	Log of the Real Per Capita Volume of Bank Transaction
NBL	Nepal Bank Limited
NGDPR	Real Non-agricultural Sector GDP
NIDC	Nepal Industrial Development Bank
NPA	Non-performing Assets (bad loans)
NRB	Nepal Rastra Bank (the central bank of Nepal)
PBB	Average Population Density per Bank Branch
PBCIA	Per Capita Bank Credit to Industry and Agriculture Sector
PSB	Privatisation of State-owned Banks
RBB	Rastriya Banijya Bank
REB	Removal of Entry Barriers
RFR	Real Refinance Rate (the rate charged by the central bank on refinance to commercial banks)
RRR	Reduction in Reserve Requirements
Rs	Rupees (Nepalese currency)
SBCP	Share of Bank Credit to Private Sector in the Total Bank Credit
SBCPP	Share of Bank Credit to Poor Population in the Total Bank Credit
SLR	Statutory Liquidity Ratio
SMR	Stock Market Reform
SNGDP	Share of Non-agricultural Sector GDP in the total GDP
TBCR	Real Total Bank credits
TBs	Treasury Bills
TDR	Real Time Deposits (at banks)
VBT	Real Total Volume of Bank Transaction
VBTP	Log of the Real Per Capita Volume of Bank Transaction

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ABSTRACT

This study examines the overall impact of financial liberalisation on Nepal's financial system and economy. The study is specifically directed towards analysing the rationale of executing a financial liberalisation policy; preparing an account of the evolution, process and sequencing of the financial liberalisation; and evaluating the impact of the various liberalisation measures on financial and economic developments of Nepal with cointegration and causality tests.

The study makes significant contributions in the area of the impact evaluation of financial liberalisation. Most of the previous studies focus on the economic growth aspect of financial liberalisation in detail, but attach less importance to the redistribution of income and stability of the financial systems. To bridge this gap, an aggregated framework for impact evaluation, which includes all of the three dimensions, is implemented in this study. The framework implemented in this study is useful not only for the impact evaluation of financial liberalisation policy, but also for other public policies.

A summary index of the financial liberalisation comprising eight policy instruments is employed in this study. As some of these instruments have not been immediately fully employed, the index is designed to take into account their gradual implementation. The instruments are interest rate deregulation, removal of entry barriers, reduction in reserve requirement, easing in credit controls, implementation of prudential rules, stock market reform, privatisation of state-owned banks and external account liberalisation. A sequential procedure has been applied to test for unit roots on time series data. This procedure helps to determine the optimal test method for each time series under consideration and reduces the risk of model misspecification and biased results.

The empirical test results obtained using the Nepalese quarterly data from 1970-2003 suggest that financial liberalisation in Nepal has had a mixed impact on the financial system and the national economy. The number of per capita bank branches is found to be positively associated with the widening of the financial sector, which in turn affects financial development positively. The real deposit interest rate affects the volume of time deposits (savings) positively, but the increase in gross domestic product does not

affect time deposits. The volume of time deposits affects the volume of bank loans positively, but the lending rate does not have a significant impact on the volume of bank loans. Collectively, the financial liberalisation measures are positively associated with per capita income as well as with industrial development.

The population density per bank branch is found to be positively associated with the volume of bank credit to the poor, while the overall measures of financial liberalisation are negatively associated with such credit. The results also suggest that financial liberalisation is positively associated with the credit-deposit ratio of the commercial banks. However, the higher credit-deposit ratio is not only associated with higher return, but also with higher risk. Therefore, it can be argued that financial liberalisation has brought instability in the Nepalese financial sector.

The overall finding of this study is that financial liberalisation is positively associated with growth, but negatively associated with income equality and financial stability. However, the study does not find any causal relationship between financial development and economic growth in Nepal. Hence, the financial liberalisation in Nepal has not facilitated a financial development to the extent that contributed significantly to the economic development of the country.

Chapter 1

INTRODUCTION

1.1 Orientation

The developing countries until the 1970s focused on state-initiated development and mainly emphasized infrastructure development. They believed that basic infrastructures would open the door for economic growth and development. Following this approach, resources were directed towards the building of roads, power, communication, and so on. The concept was that if a well functioning infrastructure was in place, the private sector also would be attracted to investing in new projects. This in turn would help industrial development in the country, and ultimately, a higher economic growth would be achieved.

Despite the planned efforts of the governments, developing countries could not achieve economic growth to a satisfactory level. The private sector participation could not be increased, mainly due to the resource scarcity. Whatever resources were available in the market also could not be used efficiently, because of the under-developed and highly controlled financial systems in these countries. Acknowledging this situation, the emphasis of developing countries has shifted from infrastructure development to financial sector development.

However, the highly controlled state of the financial system in developing countries pulled the private sector back from playing an active role in the economy. The government controlled the interest rates and credit ceilings, owned banks and financial institutions, and framed regulations with a view to making it easy for the government to acquire the financial resources at a cheap rate. Since the nominal interest rate was controlled and the real interest rate mostly remained negative, savings could not be encouraged. As a result, investment could not increase to the desired level. This ultimately slowed the economic growth.

As early as 1973, McKinnon (1973) and Shaw (1973) have identified this problem of financial repression in developing countries and have argued for a

liberalisation of the financial system. The World Bank and the International Monetary Fund, since mid 1980s, started to prescribe financial liberalisation as a basic framework for member developing countries to foster their economic growth (Nepal Rastra Bank 2001a; The World Bank Group 2005). With this, the era of financial liberalisation started in the developing countries with the technical and financial assistance of the World Bank and the International Monetary Fund. The initial liberalisation measures taken by some developing countries in early 1980s showed very impressive results. This type of result became the motivating factor for other developing countries to liberalise their financial sector. But the financial liberalisation did not only bring prosperities for the developing countries; it became a cause of financial fragility too. The Asian financial crisis of 1997 emerged out of the backdrop of financial liberalisation. Nevertheless, financial liberalisation still remains an ongoing process in developing countries.

1.2 Objectives of Financial Liberalisation in Nepal

The Nepalese financial system, until the mid 1980s, was comprised of less than a dozen banks and financial institutions including the central bank. As in other developing countries, financial repression in Nepal existed in the form of control of interest rates, ceilings on bank credit, directed credit policies, high reserve requirements and entry barriers for new banks and financial institutions. As a result, the banking and financial services could not reach a wider population, and bank loans could not be extended in sufficient amount due to the prevailing credit ceilings. Hence, the financial system could not cater to the demand of the areas other than the favoured ones. Due to the ‘repressed’¹ and underdeveloped state of the financial system, wherever and whatever banking and financial services were available were primitive in nature and grossly inefficient. In this context, the main objective of financial liberalisation in Nepal was to ‘widen’ and ‘deepen’ the financial system and enhance efficiency through increased competition so that the financial system becomes able to aid in the economic growth of the country. The following sub-sections shed light on the main objectives of implementing financial liberalisation policy in Nepal.

¹ Financial ‘repression’ is a state where the financial sector is highly regulated.

1.2.1 Financial Widening

‘Financial widening’ refers to the increasing use of money in exchanging goods and services. There had been an increased use of money in Nepal following the establishment of Nepal Bank Limited (NBL) in 1937, Nepal Rastra Bank (NRB) in 1956, and Rastriya Banijya Bank (RBB) in 1966. However, there was still scope for financial widening mainly because of the existence of vast non-monetised activities in rural areas in general, and the agricultural sector in particular (Khatiwada 1999).

Although the state-owned commercial banks extended their branches in remote areas of the country, this was not sufficient. Not all the banking service needs of the businesses and the households were catered to by the existing banks, since they were directed to provide the banking services to the specified sectors and for the specified purposes only. Most of the rural population had to depend on village shop keepers and money lenders for their banking service needs. In this context, the financial liberalisation policy in Nepal was aimed at expanding banking services to the wider population, as well as to widen investment in different sectors and geographical areas.

One of the key features of financial liberalisation is interest rate deregulation, which leads to a positive real deposit rate and thereby attracts more savings. In developing countries, there is a greater need of investment from the public as well as the private sector in order to achieve a higher economic growth. Higher investment is possible only with higher savings mobilisation. Therefore, the positive real deposit rate is instrumental in savings mobilisation, increased investment, and ultimately in higher economic growth. In the past, when interest rates were controlled, attempts by the NRB to keep the real deposit rates positive *via* frequent adjustments in the nominal interest rate, along with changes in inflation rate were not successful all the time. This was caused by delays in the implementation of policy changes (Khatiwada 1999). Therefore, financial liberalisation was aimed at maintaining the real deposit rate positive by removing ceilings on nominal interest rates.

Private sector investment is regarded to be more efficient than public sector investment, because of the incentives associated with the returns on investment. As the owners of investment projects, private individuals get higher returns on their investment. In the case of public investment, the manager has relatively weaker incentives because he is not the owner, and hence gets only a fraction of the return on investment (Shleifer 1998, pp.137-138). Therefore, increased private sector investment

is supposed to accelerate economic growth. But due to the seigniorage collection by the government in the form of high reserve requirements, the private sector investment was crowded-out by government investment, thus adversely affecting economic growth. In this context, one of the specific objectives of the financial liberalisation in Nepal was to increase the availability of credit to the private sector so that the private sector investment is promoted and available financial resources are invested more efficiently.

In developing countries, where domestic resource mobilisation is at an inadequate level, foreign capital may be a crucial means to increase investment. When the financial system is highly regulated, foreign capital inflow cannot be expected because of the high restrictions on repatriation. Therefore, one of the reasons for adopting financial liberalisation policies in Nepal was to attract foreign capital. The removal of entry barriers in the banking sector of Nepal was specifically targeted at attracting foreign capital for the establishment of new banks. The establishment of new banks will not only increase competition in the banking sector but also will cater to the demands of a wider section of the population.

1.2.2 Financial Deepening

Financial liberalisation was not only limited to financial widening but was also intended to deepen the financial sector. ‘Financial deepening’, which is measured as a ratio of financial assets or broader monetary aggregates to the gross domestic product (GDP), refers to the greater financial resource mobilisation in the formal financial sector, and the ease in liquidity constraints of banks and enlargement of funds available to finance projects (Fisher 1993). High financial deepening creates a favourable environment for increased resource deployment in the economy, which in turn can lead to an accelerated economic growth. In this context, enhanced financial deepening for accelerating economic growth was one of the objectives of financial liberalisation in Nepal (Khatriwada 1999).

Economic activities in the country can be greatly facilitated by modern banking services. Financial deepening involves the introduction and intensive use of new financial products. In the past, government-owned commercial banks limited their services in offering only ‘traditional’ banking products. Thus, the businesses, households and the government were deprived of modern banking and financial service products. In this context, financial liberalisation was also aimed at modernizing the

banking system in order to avail modern banking and financial service products in the Nepalese financial markets.

Financial intermediation cost becomes high when the administrative cost of banks is high. Administrative costs of two Nepalese government-owned banks remained high, resulting in a high intermediation cost. One of the main reasons of such high cost was the use of traditional management structure, technology, method and process by these banks. In this context, financial liberalisation in Nepal was also aimed at reducing the administrative costs of the banks.

The interest rate spread, i.e., the gap between the interest rate charged by the bank on loans extended and the interest rate offered on the deposits collected, plays a vital role in deciding the volume of resources mobilized. A higher interest rate spread means that a higher interest rate is charged on loans and a lower interest rate is paid on the deposits. A persistent high interest rate spread inhibits financial development. When the interest rate spread is low, the depositors receive a higher interest on their resources and the borrowers get the resources at a lower interest rate. The interest rate spread of the commercial banks had remained quite high. Therefore, one of the specific objectives of financial liberalisation was to lower the interest rate spread of the banks.

Banks and financial institutions perform the financial intermediary role by collecting financial resources from surplus units and availing that to the deficit units. When the deficit units receiving the resources through the bank do not pay back, the bank cannot return the funds to the depositors, or the surplus unit. Such an overdue loan, which is known as a non-performing asset (NPA) obstructs the financial intermediation process. The NPA of the two Nepalese state-owned commercial banks, NBL and RBB, stood at 16 per cent and 35 per cent of their total loan portfolios before 1984, respectively; this indicated the bad health of these institutions. Therefore, financial liberalisation was also aimed at reducing the non-performing assets of these banks.

As mentioned earlier, Nepalese banks and financial institutions were offering traditional banking products in the traditional way and thus remained far from using such modern technology as computer hardware and software, and other electronic means and equipment. Therefore, one of the specific objectives of financial liberalisation was to create an environment of technology transfer, in order to facilitate the use of modern technology in the Nepalese banking system.

1.2.3 Competition and Efficiency

Another objective of financial liberalisation was to increase competition and efficiency in the financial system. Due to the highly regulated environment and a secure market, there was no competition in the financial system and as a result, banks and financial institutions remained inefficient. To tackle this problem, financial liberalisation was aimed at nurturing competition and through this, promoting efficiency in the financial system.

As is the case of financial systems of other developing countries, the Nepalese financial system was characterised by inefficient resource allocation. Regulated interest rate and credit ceilings, directed credit, and lack of competition were the main reasons behind such allocation. Deregulation of interest rate, removal of credit constraints, and introduction of competition helps mobilise the financial resources to high yielding sectors, which in turn leads to a higher economic growth. Therefore, one of the specific objectives of financial liberalisation was to improve the allocative efficiency of the available resources.

Improved competition enhances operational efficiency by lowering financial intermediation costs, by improving service quality and promoting innovation. This stimulates savings and investment, and thus has a direct bearing on economic growth. In this context, financial liberalisation also was aimed at improving the operational efficiency in the financial sector.

The needs of the customers are ever changing. To fulfil such changing needs and to utilize newly developed technology, methods and processes, banks and financial institutions need to have dynamic efficiency within them. With such efficiency only these institutions can generate the host of new financial instruments required to cater to the changing needs of the consumers. Both the depositors and the borrowers can benefit from such development. Therefore, one of the expected outcomes of financial liberalisation in Nepal was enhancing the dynamic efficiency in the financial system.

With a view to achieving the above-mentioned objectives, Nepal started financial liberalisation process in mid 1980s, and various measures have been employed under this process. The effectiveness of the policy in general and various policy measures in particular is unknown since a comprehensive impact study of the policy has not been conducted so far. In this context, this study aims at bridging this gap.

1.3 Objectives of the Study

Different measures adopted in the process of financial liberalisation in Nepal have certainly brought some changes in different aspects of the financial system and the country's national economy. In order to ascertain its effectiveness, it is necessary to conduct the impact evaluation of the policy. In this regard, this study intends to examine various aspects of financial liberalisation in Nepal.

The main objectives of the study are as follows:

- to examine the rationale of executing financial liberalisation policy in general,
- to prepare an account of the evolution, process and sequencing of the financial liberalisation in Nepal, and
- to evaluate the impact of the various liberalisation measures on financial system and economic growth of Nepal.

1.4 Structure of the Thesis

This thesis is divided into 7 chapters. Chapter 1 is the introductory part of the thesis. Chapter 2 presents a comprehensive survey of the literature on financial liberalisation. This survey forms the theoretical basis for my study of the Nepalese case. In this chapter, the relationship between the financial system and economic growth is analysed; the theory of financial repression and financial liberalisation is discussed; the importance of the proper sequencing of liberalisation measures is highlighted; and issues related to welfare and financial fragility are examined.

Chapter 3 describes the liberalisation process in Nepal. In this chapter, an overview of the Nepalese economy is presented; the Nepalese financial system before liberalisation is discussed; and, the measures adopted under liberalisation process are analysed.

Chapter 4 focuses on the methodology of this study. This chapter develops an aggregated framework for impact evaluation and outlines the hypotheses of the study. A financial liberalisation index is constructed to reflect the level of financial liberalisation in Nepal. Econometric models are specified in order to conduct the empirical tests on the impact of financial liberalisation on economic growth, distribution and financial

stability. The nature and sources of the data used in this study are also discussed in this chapter.

Chapter 5 deals with the unit root test on the time series of the variables used for studying the impact of financial liberalisation in Nepal. Various methods of the unit root test are reviewed, and a sequential procedure based upon a general to specific approach is developed. The unit root test results obtained by employing the sequential procedure is presented and interpreted in this chapter.

Chapter 6 contains the empirical results of the study. The cointegration and causality test statistics are presented and their results are summarised in this chapter. The long run relationships detected by the cointegration test assess the impact of financial liberalisation on various aspects of the Nepalese financial as well as economic systems. Similarly, the causality test results shed light on the direction of the causality between variables.

Chapter 7 concludes the thesis. The major empirical findings of the study are highlighted and their policy implications are analysed in this chapter. This chapter also indicates the contribution of the study and suggests issues for future research.

Chapter 2

SURVEY OF THE LITERATURE

This chapter presents the survey of the literature on financial liberalisation, which forms the theoretical basis of this study. In section 1, the role of the financial system in economic development is discussed. Section 2 sheds light on the concept of financial repression and outlines the issues associated with it. Section 3 reviews the theoretical background behind financial liberalisation and analyses the empirical findings of the previous research works. The importance of sequencing of financial liberalisation is illuminated in section 4. In section 5, various aspects of financial liberalisation and welfare are appraised. Section 6 examines the link between financial liberalisation and financial fragility. And finally, summary of the chapter and concluding remarks are presented in section 7.

2.1 Role of Financial System in Economic Growth

The financial system plays an important role in the process of economic development. Its primary task is to move scarce funds from those who save to those who borrow for consumption and investment. By making funds available for lending and borrowing, the financial system provides the means for economic growth.

The financial system determines both the cost and the quantity of credit. What happens in this system has a powerful impact upon the health of the entire economy. When credit becomes more costly and less available, total spending for goods and services falls; businesses cut back production and reduce their inventories. As a result, unemployment rises and economic growth slows down. In contrast, when the cost of credit declines and loanable funds become more readily available, total spending in the economy increases, more jobs are created, and economic growth accelerates.

However, economists differ in their viewpoints regarding the role of finance in economic growth. In fact, the relationship between financial development and economic growth has remained an issue of debate. Subsequently, sub-section 2.1.1 highlights such

differing viewpoints possessed by economists in some detail, and sub-section 2.1.2 discusses the relationship and causality between financial development and growth. Similarly, sub-section 2.1.3 presents an overview of the channels through which financial development is said to affect real economic growth.

2.1.1 Different Viewpoints

In the literature, three different views have emerged concerning the potential role of finance on economic growth. The first view considers finance as a critical element of growth. According to this view, services provided by the financial system are essential for growth. The second view regards finance as a relatively unimportant factor in growth. In this perspective, as the real sectors of the economy grow, the demand for various financial services rises and thus will be met by the financial sector. This view clearly suggests that financial development simply follows economic growth. The third view goes even further to claim that the financial development may potentially have negative impact on growth. The key studies related to each of these three views are discussed below.

As early as 1911, Joseph Schumpeter claimed that the services provided by financial intermediaries form an element of economic development through channelling the society's funds to the most innovative entrepreneurs (Schumpeter 1934, p.103). Hicks (1969, pp. 144-145) argues that financial development played a crucial role in igniting industrialization in England. The industrial revolution required funds for long-term capital investment. Emergence of financial markets that traded a variety of securities encouraged savers to hold such assets, and these availed liquid funds for long-term investment. "The industrial revolution may not have occurred without this liquidity transformation (Levine 1997, p.692)." These arguments highlight the role of the financial system in economic development.

In contrast, some prominent economists view finance as a relatively unimportant factor in economic development. Robinson (1952) claims that financial development primarily follows economic growth. She asserts: "by and large, it seems to be the case that where enterprise leads finance follows (p.20)." Similarly, Lucas (1988, p.6) states, "the importance of financial matters is very badly over-stressed." His model of economic growth encompasses physical capital, human capital and technological change as the only factors affecting economic growth.

Van Wijnbergen (1982, p.134; 1983, p.60) and Buffie (1984, p.312) highlight the role played by curb market in developing countries and suggest that in certain cases, financial development may have a negative impact on growth. According to this view, as the formal financial system develops, the funds move from a curb market to the formal financial market. But due to the reserve ratio requirement in formal markets, the entire fund switched from the curb market cannot be loaned. This reduces the aggregate domestic credit supply. The reduction in the supply of credit leads to a credit crunch, which can retard economic growth by lowering investment and slowing the production. This view strongly contradicts the common assertion that the financial development leads to efficient financial intermediation, and thereby increases the aggregate credit supply. Their views particularly overlook the risk factor, which might be crucial in determining the volume of credit supply.

2.1.2 Relationship and Causality

The pioneering empirical work by Goldsmith (1969) was successful in documenting the positive relationship between financial development and economic growth. Goldsmith used annual data for a period from 1880 to 1963 from 35 countries and employed a financial interrelations ratio¹ to relate the process of financial development to modern economic growth. He asserts that financial superstructure accelerates economic growth and improves economic performance by facilitating the migration of funds to the place in the economic system where the funds will yield the highest social return (Goldsmith 1969, p.400).

Development economists frequently express their scepticism about the relationship between finance and growth by ignoring the role of the financial system. Chandavarkar (1992) notes that none of the pioneers of development economics even listed finance as a factor in development. This claim, however, has been challenged by Lewis (1955), one of the pioneers of development economics. He has postulated a relationship between financial development and economic growth. He observes that financial markets develop as a consequence of economic growth, which in turn feeds back as a stimulant to real growth. This view has been supported by Patrick (1966).

¹ Goldsmith derived the financial interrelations ratio (FIR) by dividing the value of all financial instruments outstanding by the value of national wealth.

Patrick (1966) proposes a useful framework for the study of the causal relationships between finance and growth. He highlights the distinction between the ‘supply-leading approach’ and the ‘demand-following approach’ in financial development. According to his views, ‘demand-following’ financial development appears as a consequence of the development of the real sector, whereas ‘supply-leading’ financial development precedes demand for financial services, and can have an autonomously positive impact on growth. This hypothesis suggests the two-way causality that may exist between financial development and economic growth (Patrick 1966, pp.174-177).

Since the seminal work of Goldsmith (1969), economists have been showing their concern about the relation between financial development and economic growth. A growing body of empirical studies and cross-country comparisons revealed a strong positive link between the functioning of the financial system and long-run economic growth. McKinnon (1973) and Shaw (1973) also documented a positive correlation between growth and indicators of financial development. However, these studies fail to explain the direction of causality between financial development and economic growth.

A series of studies have been devoted to analyse the direction of causality between financial development and economic growth. Most contemporary studies put forward the idea that financial development has a strong causal influence on growth (Gupta 1984; King and Levine 1993a; Blommestein and Spencer 1996; Levine 1997; Rajan and Zingales 1998; Levine 1999; Beck, Levine *et al.* 2000; Xu 2000; Carlin and Mayer 2003; Fase and Abma 2003). This view suggests that the direction of causality runs from the financial to real development. Similarly, some studies have also claimed that there exists a bi-directional relationship between financial development and economic growth (Greenwood and Jovanovic 1990; Luintel and Khan 1999). Contrary to the above assertions, some studies do not find any strong causal relationship between financial development and economic growth (Demetriades and Hussein 1996; Ram 1999).

Gupta (1984) attempted to empirically examine whether financial development was the consequence of or the cause of economic growth. He conducted causality test for 14 developing countries using the data from the 1961-1980 period², and employing

² Time periods for some countries vary.

five different variables³ as proxies for financial development and industrial production as a proxy for real economic growth. He found that economic growth was the result of financial development. He also reports some evidence of causality from real to financial variables, with even lesser evidence for two-way (simultaneous) causality. This finding mainly suggests that the direction of causality ran from financial development to economic growth (Gupta 1984, p.41, 56).

King and Levine (1993a) conducted an empirical study using data on 80 countries over the 1960-1989 period. They employed four indicators of financial development: overall size of the formal financial system; bank deposits; credit allocated to the private enterprises; and, claims on the non-financial private sector. They found that higher levels of financial development are positively associated with faster rates of economic growth, physical capital accumulation, and economic efficiency improvements (King and Levine 1993a, p.719).

Xu (2000) examines the effects of permanent financial development on domestic investment and output in 41 countries for the sample period of 1963-1993. He includes real GDP, real domestic investment, and an index of financial development in his multivariate Vector Auto-Regressive (VAR) framework. The result rejects the hypothesis that financial development simply follows economic growth and has very little effect on it. Instead, there is strong evidence that financial development is important to growth (Xu 2000, p.333-334, 343).

Beck *et al.* (2000) employ data for 63 countries over the period 1960-1995 to examine the relation between financial intermediary development and sources of growth. They use private credit⁴ and liquid liabilities⁵ as measures of financial intermediary development. They find that there is a robust, positive link between financial intermediary development and both real per capita GDP growth and total factor productivity growth (Beck *et al.* 2000, p.265).

³ Gupta uses M1 (currency plus demand deposits), M2 (M1 plus quasi money), CR (total domestic credit), PCR (total private credit), and F (total finance) as the indicators of financial development.

⁴ Private credit is equal to the value of credits extended by financial intermediaries to the private sector divided by GDP.

⁵ Liquid liabilities equal the liquid liabilities of the financial system, calculated as currency plus demand and interest-bearing liabilities of financial intermediaries and non-bank financial intermediaries, divided by GDP.

Fase and Abma (2003) conduct the empirical study for nine emerging economies in Asia for a sample period of 25 years (1974-1999)⁶. They use balance sheet totals of the banking sector as the measure of financial development. They report that financial development matters for economic growth and that causality runs from the level of financial intermediation and sophistication to growth (Fase and Abma 2003, p.16, 20).

Carlin and Mayer (2003) examine the interrelation between the structure of a country's financial systems and industrial growth. They use the data from the OECD countries over the period 1970 to 1995, and employ the investment of 27 industries as the proxy for industrial growth. They report a strong relation between the structure of countries' financial systems and growth of industries in these countries. They found a particularly strong relation between the structures of countries' financial systems and the growth of industries that are dependent on external equity and skilled labour (Carlin and Mayer 2003, p. 6).

Greenwood and Jovanovic (1990) found growth and financial structure to be inextricably linked. They claim that growth provides the means to develop financial structure, while financial structure in turn allows for higher growth since investment can be more efficiently undertaken (Greenwood and Jovanovic 1990, p.457-458). Luintel and Khan (1999) empirically examine the long-run causality between financial development and economic growth in a multivariate time series framework using data from 10 sample countries. Their finding supports the bi-directional causality between financial development and economic growth in all the countries analysed (Luintel and Khan 1999, p. 402).

However, Demetriades and Hussein (1996) find very little support for the view that finance is a leading sector in the process of economic development. They find evidence in quite a few countries that economic growth systematically causes financial development. Similarly, Ram (1999) argues that the preponderance of empirical evidence does not encourage one to share the view that financial development is observed to have a positive effect on economic growth (Ram 1999, p.172).

2.1.3 Transmission Channel

A series of recent growth studies have analysed the various channels through which financial development can contribute to economic growth. Pagano (1993) argues

⁶ Sample periods for some countries vary.

that financial intermediation can affect economic growth “by acting on the saving rate, on the fraction of saving channelled to investment, or on the social marginal productivity of investment (Pagano 1993, p.621).” This view tends to highlight savings and investment as the transmission channel through which financial intermediation affects growth.

The World Bank (1989) believes that efficient financial systems help economic growth “partly by mobilising additional financial resources and partly by attracting those resources to the best uses (The World Bank 1989, p.40).” Dornbusch and Reynoso (1989) also hold a similar view. They observe that financial factors in economic development potentially exert an influence through two channels: they affect the availability of savings, and also the intermediation of these savings to the highest return investment opportunities (Dornbusch and Reynoso 1989, p.204). This view clearly suggests that the financial system add to growth through mobilization and the efficient use of financial resources.

Bencivenga and Smith (1991) use savings deposited in banks as the factor leading to growth and show that the creation and growth of financial institutions leads to a positive relationship between financial intermediation and economic growth.

Gregorio and Guidotti (1995) find a positive effect of financial development on the long-run growth of real per capita GDP. Their findings suggest that the effect of financial intermediation on growth is due mainly to its impact on the efficiency of investment, rather than its volume. They find that only one-fourth of the effect of financial development on growth is channelled through the volume of investment; and the rest three-fourth explained by an improved efficiency of investment.

Demirgücs-Kunt and Levine (1996) offer empirical evidence for the importance of stock market development for output growth. Beck *et al.* (2000) found that the level of financial development and the surroundings in which financial intermediaries and markets operate influence economic growth.

Jayaratne and Strahan (1996) suggest a positive effect on per capita growth through improvement in the quality of bank loans. This result implies that the improvement in the quality of bank loans is the main channel through which economic growth is influenced.

Hermes and Lensink (1996) point out the functions and services provided by financial markets to highlight their importance in the process of economic growth.

According to them, financial markets create an accepted medium of exchange, which facilitates trade among economic agents, and provide various services related to stimulating the volume of savings, and transferring these savings to the most efficient investment projects. This view is supported by Berthelemy and Varoudakis (1996). They observe that the major contribution of a financial system to growth comes from the setting up of an efficient and adaptable system of payments. A reliable means of exchange is a necessary condition for growth. In cases where no such system exists, prohibitive transaction costs cancel out any productivity gains linked to the division of labour, and the beginning of some sort of economic growth.

Levine (1997) argues that financial function may affect economic growth through two channels: capital accumulation and technological innovation. Blommestein and Spencer (1996); Levine and Zervos (1998); and Beck and Levine (2001) suggest that stock market liquidity and bank development positively influences economic growth. Rajan and Zingales (1998) emphasize that financial development lowers the costs of external financing, and therefore fosters economic growth. Xu (2000) regards investment as an important channel through which financial development affects growth. Carlin and Mayer (2003) claim that financial development can affect economic growth through industrial growth with increased investment in industries.

It is obvious from the above discussion that increased savings, efficient investment, active stock market activities, quality bank services, transaction ease, and suitable financial structure are the possible channels through which financial development can influence economic growth.

It can be observed that there is a growing consensus that financial development positively influences real growth. Financial development through enhanced banking services and stock market activities facilitates financial intermediation. Efficient financial intermediation reduces transaction costs and financial risks, and thus influences the savings rate. It channels the funds to the most productive enterprises and facilitates technological innovation, ultimately helping long-term growth. This view has the direct policy implication that developing countries can accelerate their economic growth through reforming their financial sector.

Despite the widely recognized importance of financial development, many governments in the past have obstructed the development process in the financial sector by introducing a whole host of restrictions and controls. The following section discusses

the arguments behind such restrictions and controls, and also highlights the measures and consequences of financial repression.

2.2 Financial Repression

Financial ‘repression’, the term coined by McKinnon (1973) and Shaw (1973), refers to a state where the financial sector is highly regulated and distorted by the government through various measures. Interest rate ceilings on bank deposits and loans, compulsory credit allocation, heavy reserve requirements, and various types of prohibition on international financial transactions are common features of a repressed financial system. In such a repressed state, real deposit rates of interest are often negative, and foreign exchange rates also become highly uncertain (McKinnon 1991, p.11).

Roubini and Sala-i-Martin (1995) assert that governments repress financial development by “not allowing the financial sector to operate at its full potential by introducing all kinds of regulations, laws, and other nonmarket restrictions to the behaviour of banks and other general financial intermediaries (p.277).”

In a repressed financial sector, the reserve requirements provide an important means of forced borrowing from the private sector, and preferred borrowers receive heavily subsidized credit from the banking sector. The deposit rate of interest is fixed by government regulation, so that it can no longer adjust to bring about a savings-investment balance. Actual investment is only about 80 per cent of desired investment at existing inflation and interest rates (Lewis 1992, p.153).

Fry (1980) interprets financial repression as the technique of holding institutional interest rates, particularly deposit rates of interest, below their market equilibrium levels (p.317).

The following sub-sections shed light on the reasons behind implementing the policy of repression, various repression measures adopted by governments, and the consequences of financial repression.

2.2.1 Rationale for Repression

In most developing countries fiscal deficits are significant and persistent. They do not have efficient taxation systems. Therefore, in order to finance their fiscal deficits, governments may choose to repress the financial sector because it delivers them easy

inflationary revenue (Denizer, Desai *et al.* 1988, p.2; Roubini and Sala-i-Martin 1992, p.28; 1995, p.298). Such ‘easy’ revenues are also known as seigniorage⁷ revenues. Monetary expansion is a much easier method of financing government expenditures. The money is simply printed on the backing of government securities. No government tax collectors are required, and government expenditures appear to be financed at little cost to the public. Legislative approval is often not required (Espinosa and Hunter 1994, p.4).

Seigniorage extraction is a less problematic method of raising revenue. It can be accomplished by imposing large reserve requirements on commercial banks. These reserve requirements force commercial banks to hold government liabilities such as currency or government bonds beyond the point they would otherwise consider optimal. Through such large reserve requirements, the monetary authority, and eventually the government, avails itself of part of the economy’s savings that would otherwise remain with financial intermediaries (Espinosa and Hunter 1994).

Another frequently cited reason behind financial repression is imposing the anti-usury law to intervene in the free determination of interest rates, in order to protect the public from exploitation. Similarly, the allocation of subsidized credit to the favoured sector is another ground for financial repression. Such directed credit programs are carried out due to the government’s belief that commercial banks allocate credit in a largely speculative and socially undesirable fashion, and that they knew better than markets what the optimal allocation of savings was, or what kind of investments were more or less desirable (Roubini and Sala-i-Martin 1992, p.7; Espinosa and Hunter 1994, p.4). This claim was frequently supported with evidence from high-growth economies in East Asia, where governments supposedly manipulated financial systems in order to promote targeted industrial expansion (Denizer, Desai *et al.* 1988p.2).

It is also argued that a strict control and regulation of the banking system under financial repression would give the monetary authorities a better control over the money supply. Similarly, financial repression is associated with interest rates below market rates, which reduces the costs of servicing government debts (Roubini and Sala-i-Martin 1992, p.7).

⁷ ‘Seigniorage’ is a term derived from the French word ‘seigneur’, which means lord. In medieval times, one of the rights of the feudal lord was to coin money that his subjects had no choice but to accept, no matter how little gold or silver it contained. Seigniorage was the profit the lord made by exercising this right (Espinosa and Hunter 1994, p.4).

2.2.2 Repression Measures

According to McKinnon (1973) and Shaw (1973), high reserve requirements, taxation of financial intermediaries, capital controls, interest rate ceilings, mandatory purchases of government debt, and directed credit policies are the direct and indirect measures of financial repression.

The interest rate ceiling is one of the measures most commonly used by governments to repress the financial sector. Until the 1970s, economists assumed that low interest rates would promote investment spending and economic growth in accordance with Keynesian and neoclassical theories (Morisset 1993, p.133). With a view to keep the interest rate low, governments through their central banks fix a ceiling for interest on deposits and loans. Commercial banks and other financial institutions are compelled to set their interest rates strictly following this ceiling. Governments in financially repressed regimes tend to control deposit and lending rates below the level of the inflation rates, so that real interest rates will tend to be artificially low and negative (Roubini and Sala-i-Martin 1995, p.21).

A high reserve requirement is another measure of financial repression. A reserve requirement is one of the common monetary instruments used by the central banks for monetary control since reserve ratio plays a key role in money supply. Money supply (M), in simple terms consists of currency (CU) and deposits at banks (D):

$$M = CU + D \quad (2.1)$$

Currency and reserve (RE) constitute high-powered money (H):

$$H = CU + RE \quad (2.2)$$

The money supply process can be summarized by three variables: the *currency-deposit ratio*, $cu = CU/D$; the *reserve ratio*, $re = RE/D$; and the stock of *high-powered money*, H . Rewriting equations (1) and (2) we get $M = (cu + 1)D$ and $H = (cu + re)D$. We can express the money supply in terms of its principle determinants, re , cu , and H :

$$M = \frac{1 + cu}{re + cu} H = \mu H \quad (2.3)$$

Where μ is the money multiplier given by:

$$\mu = \frac{1 + cu}{re + cu}$$

The above relationship clearly reflects the importance of reserve in money supply.

The reserve requirement is expressed as the ratio of reserve to total deposits mobilized by the banks. In other words, banks need to keep certain portions of their total deposits as reserve. In a financially repressed economy, central banks instruct commercial banks to maintain a high cash reserve ratio (CRR) and statutory liquidity ratio (SLR). In order to maintain the CRR, a part of the reserve is held in cash in the bank's vault and part is held with central bank. Banks have to pay interest on deposits mobilized by them, but they cannot use the CRR equivalent portion of deposits for earning purposes. Similarly, banks maintain SLR by putting certain portions of their deposits on government-approved securities.

Reserve requirement creates an artificial demand for government securities. Since the banks have to purchase the government bonds, the government is able to borrow from the banking sector at an interest rate lower than that charged to the private sector (Gupta and Lensink 1997, p.352). This provision crowds-out the private sector investment.

Credit rationing and cheaper credit to the public enterprises as well as to other favoured sectors are other measures through which governments exercise financial repression. Credit rationing is a condition of loan markets in which the lenders' supply of funds is less than the borrowers' demand at the quoted contract term (Jaffee 1989, p.103). Due to the below market level lending rates, the demand for credit exceeds the capacity to supply. Because of such excessive demand for credit, the government invariably begins to ration credit among competing users. Similarly, under the repressed system, banks are not allowed to invest all of their financial resources on high-yielding projects. Instead, they are directed to extend certain portions of their credit to certain sectors at a lower interest rate (Denizer, Desai *et al.* 1988, p.3; Roubini and Sala-i-Martin 1995, p.6).

2.2.3 Consequences of Financial Repression

McKinnon (1973) and Shaw (1973) claim that repressing the financial system fragments the domestic capital market, with highly adverse consequences for the quality and quantity of real capital accumulation. They highlight the damaging effects of repressive policies on economic growth. According to them, various mandated

restrictions interact with ongoing price inflation to reduce the attractiveness of holding claims on the domestic banking system. In such a repressed system, real deposit rates of interest on monetary assets are often negative, and rates also become highly uncertain.

In a repressed financial system, the flow of loanable funds through the organized banking system is reduced, forcing potential borrowers to rely more on self-finance. Interest rates on the truncated flow of bank lending vary arbitrarily from one class of favoured or disfavoured borrower to another. The process of self-finance within enterprises and households is itself impaired. Since the real yield on deposits, as well as on coin and currency, is negative, firms cannot easily accumulate liquid assets in preparation for making discrete investments. Socially costly inflation hedges look more attractive as a means of internal finance. Significant financial deepening outside the repressed banking system becomes impossible when firms are dangerously illiquid, and/or inflation is high and unstable. Inflows of foreign financial capital may be unproductive when the domestic capital market is in disarray and the foreign exchange rates are unpredictable (McKinnon 1991, pp.11-12).

Haslag and Koo (2003) assess the empirical link between financial repression, financial development and growth using the data from 119 countries for the 1960-89 period. They use the inflation rate and the reserve ratio as measures of financial repression. They report that countries with high reserve ratios, on average, grow more slowly than countries with low reserve ratios. Countries with high reserve ratios also tend to have less developed financial systems than countries with low reserve ratios. And, countries with high reserve ratios, on average, have high inflation rates as well (Haslag and Koo 2003, pp.8-9).

Another study conducted by Roubini and Sala-i-Martin (1995) claim that policies of financial repression have negative effects on economic growth. They use data from 98 countries for the period of 1960-1985 in their study. They find a systematic inverse relation between growth and several measures of financial repression, as well as a negative relation between growth and inflation rates (Roubini and Sala-i-Martin 1995, p.7). According to them, countries that are financially repressed will have higher inflation rates, lower real interest rates, higher base money per capita and lower per capita growth than countries that are financially developed. This result suggests that financial repression is harmful to economic growth (Roubini and Sala-i-Martin 1995, pp.17-18).

Roubini and Sala-i-Martin (1995) also argue that among the many explanations given in the literature on the weaker growth performance of Latin America, policies that systematically repress the financial sector are among the most convincing. Repressive policies hurt economic growth because financial intermediation is an important component of the aggregate production function. The marginal product of capital of an economy more financially developed is larger than the marginal product of a less financially developed economy (Roubini and Sala-i-Martin 1995, p.6).

High inflation is one of the main characteristics of a repressed economy. De Gregorio (1995) documents the evidence that the level of inflation and its variability, as well as money growth, have negative effects on economic growth. Quantitatively, the effects of inflation on growth appear to be important. He claims that if inflation rates had been half of their level in 12 Latin American countries during the 1950-85 periods, per capita GDP growth would have been at least 25 per cent higher. The findings suggest that the main channel through which inflation affects growth is through the reduction of the productivity of capital (pp.273, 293).

The distortions created in the financial system by the policy of repression crowd out high-yielding investment, create a preference for capital-intensive projects, discourage future savings, and thereby reduce both the quality and quantity of investment in an economy (McKinnon 1973; Denizer, Desai *et al.* 1988; Gupta and Lensink 1997). Similarly, taxing interest income on government bonds held by the non-bank private sector also has a negative effect on capital formation (Gupta and Lensink 1997, p.368).

Denizer *et al.* (1988) examine relationships between financial restrictions and some fiscal indicators using annual data for 25 transition economies for the period 1990-1996. They report that tax losses are associated with higher real reserve ratios in deposit-taking banks, and that positive fiscal balances are associated with higher real discount rates. These findings suggest that repressive financial controls may be adopted not to finance deficits more cheaply than would be the case under financial liberalisation, but to maintain the authority and ensure the survival of those in power (Denizer *et al.* 1988, p.16).

Fry (1980) conducts regression analysis using data for 61 developing countries for the 1964-1976 period. He argues that estimates of saving and growth functions lead to the conclusion that the cost of financial repression appears to be around half a

percentage point in economic growth foregone for every one percentage point by which the real deposit rate of interest is set below its market equilibrium rate (Fry 1980, p.317).

Kang and Sawada (2000) highlight the status of human capital under financial repression. They argue that a policy of repression tends to result in lower human capital investment, thus lowering the long run economic growth rate (Kang and Sawada 2000, p.437).

According to Lewis (1992), in a repressed financial system, the government manipulates the banking sector for its seigniorage through the control of reserve requirements and regulation of deposit rates, which frequently results in a negative real return to saving. In addition, subsidized borrowing rates are offered to favoured sectors or groups in the economy, distorting resource allocation and forcing those not favoured to borrow at high marginal rates from the banking sector or the informal curb market (Lewis 1992, p.152).

Fry (1988) points toward the effects of financial repression on the country's balance of payments. He argues that repression can exacerbate the growth-inhibiting effects of foreign debt accumulation in developing countries. Financial repression may cause capital flight through over-invoicing of imports and under-invoicing of exports. The balance of payments deficit on current account rises when such capital flight increases. Such illegal capital flight can also affect domestic investment by increasing the domestic real interest rate because the financial capital in the domestic market becomes scarce (Fry 1988, p.78).

The literature discussed above focuses mainly on economic growth and criticises the government policies for restrictions on the financial sector. However, the literature totally ignores the welfare aspect of the economy. For most countries, economic growth may not be the sole objective. They may want to maintain a balance between economic growth and social welfare instead. Subsidised credit to favoured sectors mainly serves the objectives of social welfare. Similarly, seigniorage also can add to welfare, if the governments use such funds judiciously. Therefore, an ideal government can be assumed to optimise the growth as well as welfare by adopting some policies of restriction. But unfortunately, one cannot find any good example of such a government in the real world.

It can be seen from the above discussion that governments choose the policy of financial repression mainly in order to collect easy money for financing their budget deficits, to have control over the monetary instruments to enable them for effective regulation, and to direct the capital toward the favoured sectors. The belief that government can achieve a socially efficient allocation of resources than the private sector is another reason behind the adoption of financial repression policies. But such policies of financial repression in practice have been proved to be harmful to economic growth.

Seigniorage collection leads to inflation. High inflation and an interest rate below the market equilibrium rate cause real interest rates to be low or negative. When the real interest rate is low or negative, it discourages savings and thereby investment. Directed credit to the favoured sector results in a low return on investment. Therefore, empirical studies have clearly shown that the policies of financial repression are negatively correlated with economic growth.

The widely felt damaging effects of financial repression policies on economic growth have given birth to the theories of financial liberalisation. Following these theories, countries have been liberalizing their financial system since the 1970s. This process is still ongoing in several developing countries. In the subsequent section, the theories of financial liberalisation are discussed in some detail.

2.3 Financial Liberalisation

The economic performance of many countries deteriorated more and more under the policy of financial repression. Financial systems in these countries contracted, and the efficiency of their lending and of their operations deteriorated, eventually leading to widespread bank insolvency. The declared distributional goals of the policies also could not be met. Growth and macroeconomic stability were impaired. Negative real interest rates resulted in severe disintermediation, capital flight, and a national dependence on foreign funding as domestic savers sought to preserve their capital abroad (Caprio, Honohan *et al.* 2001, p.5). From this backdrop, the concept of financial liberalisation emerged.

2.3.1 Rationale, Objectives and Evidence

McKinnon (1973) and Shaw (1973) recognized that financial repression, which consisted of interest rate ceilings, high reserve requirements and directed credit policies, reduced the amount of domestic investment and its productivity. They came up with the idea of liberalising the financial sector as a cure for the ills caused by repression. Their view was supported by a group of economists, who are known as the McKinnon-Shaw school. This school of thought provided a theoretical ground for the financial liberalisation movement in developing countries.

McKinnon (1973) and Shaw (1973) emphasized the removal of interest rate ceilings as the key measure of financial liberalisation. They assumed that removal of such ceilings would increase real interest rates, which in turn would stimulate savings. The underlying assumption is that saving is responsive to interest rates. The higher saving rates would finance a higher level of investment. According to this view one should expect to see higher saving rates as well as higher levels of investment following financial liberalisation (Reinhart and Tokatlidis 2001, p.4). This school of thought also hypothesises that higher interest rates will increase the allocative efficiency of credit by shifting funds from inefficient investments to more efficient investments through organized sectors. Based on these hypotheses, the McKinnon-Shaw school argued that financial liberalisation would lead to higher economic growth (Cho 1990, p.479).

The main objective of financial liberalisation is to increase the supply and improve the allocation of funds for investment (McKinnon 1973; Shaw 1973; Fry 1988). A number of liberalisation programs supported by the international financial institutions over the years have had the explicit objective of increasing interest rates from levels that in many cases were substantially negative in real terms (Reinhart and Tokatlidis 2001, p.2; Laeven 2003).

Financial liberalisation often also comprises external liberalisation. The full or partial opening of an economy's capital account permits overseas lending and borrowing and attracts multinational corporations and multinational banks into the country. The elimination of interest rate ceilings helps attract more savings, while together with less lending restrictions, entices banks to supply more credit. Further, greater external opening helps to meet the excess demand of credit by providing access to international financial markets, and by making domestic intermediaries more efficient

through greater competitive pressures following the entry of multinational banks (Weller 1999, p.66).

Financial reforms also consist of the scaling down of directed credit programs. This measure allows banks to shift part of their funds from low yielding projects to high yielding investments. Barriers to entry in the banking sector are removed or lowered as well, and the development of securities markets is stimulated (Laeven 2003, p.6). Entry of the banks into the market helps widen the financial system, increasing the banks to population ratio. Similarly, development of the securities market avails the capital for longer-term investments as well as helps maintain the liquidity in the market.

Shaw (1973) argues that financial liberalisation brings monetary variables under discipline and contributes to the stability of the economy. Increased saving may be used in the place of international reserve, and the dependence on foreign aid is reduced. More flexible foreign exchange rates can also absorb some of the shocks of international trading. Government budgets are not dependent on inflation tax to finance the deficits, so there are no bursts of inflation (Shaw 1973, pp.11-12).

Economists also claim that financial liberalisation allows cross-country risk diversification. International capital markets can channel world savings to their most productive uses, irrespective of location. Liberalisation also promotes transparency and accountability, reducing adverse selection and moral hazard while alleviating liquidity problems in financial markets. Moreover, international capital markets help to discipline policymakers, who might be tempted to exploit an otherwise captive domestic capital market. In this way, financial liberalisation through triggering the financial development tends to greatly facilitate economic growth (Obstfeld 1998; Mishkin 2001; Kaminsky and Schmukler 2003).

Thus, the theoretical models mainly predict that financial liberalisation can promote economic development by increasing saving, investment, and the productivity of capital. However, there is no professional consensus on the net benefits of financial liberalisation. The evidence from both developing and developed economies points to the mixed results associated with the implementation of financial liberalisation policies.

Bekaert *et al.* (2001) argue that financial liberalisation increases economic growth. They analyse the effects of liberalisation by employing the data from 95 countries for the 1980-1997 period, and taking economic growth rates, the components of GDP (consumption, government, investment and trade), and the official financial

liberalisation indicator as variables. Their findings suggest that financial liberalisation proxied by equity market liberalisation leads to a one per cent increase in annual real per capita GDP growth over a five-year period. They find this increase to be statistically significant (p.34). They also find that the investment to GDP ratio increases, with investment partially financed by foreign capital. Another study by Bekaert and Harvey (2001) documents that financial liberalisation alone contributes to 30 per cent of the total increased growth (p.5).

Bekaert *et al.* (2001) also find evidence that consumption to the GDP ratio does not increase after liberalisation suggesting that the capital flowing in after liberalisation is not wasted on increased consumption. In a number of specifications, consumption to the GDP ratio significantly decreases. This is mainly due to reduction or no significant increase in government as well as in private consumption. After liberalisation, government expenditure decreases because of the elimination or reduction of subsidies to the favoured sectors. Similarly, private households are motivated towards investment due to the increased opportunity of investment and high return on capital. Bekaert *et al.* (2001) also find that the trade balance deteriorates across all specifications. Both imports and exports increase after financial liberalisations, but imports increase more than exports.

Laeven (2003) uses panel data on a large number of firms in 13 developing countries to find out whether financial liberalisation relaxes the financial constraints of firms. He finds that liberalisation affects small and large firms differently. Small firms are financially constrained before the start of the liberalisation process, but become less so after liberalisation. The financial constraints of large firms, however, are low before financial liberalisation, but become higher as financial liberalisation proceeds. He hypothesises that financial liberalisation has adverse effects on the financing constraints of large firms, because these firms had better access to preferential directed credit during the period before financial liberalisation (2003, p.5).

Laeven (2003) also finds that countries that have made substantial progress in liberalizing their financial sectors have shown dramatic improvements in their political climate as well. Successful financial liberalisation seems to require both the political will and ability to stop the preferential treatment of well-connected firms that often tend to be large.

Liberalisation is the unifying theme for policy in the developing world, but there is a growing recognition that greater reliance on market forces to coordinate economic decision-making has contradictory implications for policy makers. Dooley (1997) claims that liberalisation reduces the direct role of the government in the economy and hence deepens the complexity of the resource allocation problem, because liberalisation gives market mechanisms the decisive edge over planning (p.2).

For Lewis (1992), financial liberalisation through interest rate reform appears to be less of a miracle cure than its proponents often suggest. He claims that requiring zero or unchanged profits in the banking sector implies that deposit rate increases are matched by borrowing rate increases, which lowers investment demand and offsets some of the benefits of the reform. Besides, financial liberalisation leads to inflation and higher interest rates as the quantity rationing of investment is replaced by rationing through interest rates (p.159).

Arestis and Demetriades (1999) argue that the early financial liberalisation thesis is based on weak theoretical foundations. Specifically, it neglects information related problems, such as moral hazard and adverse selection, assumes perfect competition and ignores institutional considerations. According to him, the modern version of the financial liberalisation thesis, synthesized by the World Bank (1989), partly addresses these concerns by emphasizing the role of prerequisites, such as effective banking supervision and macroeconomic stability.

However, the recent financial episodes in South East Asia have shown that even where conditions like effective banking supervision and macroeconomic stability appear to be satisfied, financial liberalisation could still become the main source of financial crises. The various analyses of the South East Asian crises have identified many institutional factors that contributed to the crises, such as weaknesses in the legal framework governing the operation of financial markets, including bankruptcy laws and lack of transparency. One irony is that, before the recent crises, the East Asian economies were widely regarded as possessing a strong institutional framework conducive to promoting economic growth (Arestis and Demetriades 1999, p.454).

2.3.2 Liberalisation and its Impact on Interest Rates, Savings and Investment

Financial liberalisation has been equated to a shift towards higher real interest rates. Higher real interest rates can increase loanable funds by attracting more

household savings to bank deposits. This in turn leads to greater investment and faster economic growth (McKinnon 1973; Shaw 1973).

The interest rate can be seen as the price of borrowed money, or as the opportunity cost of lending money for a specified period of time. During this period, inflation can erode the real value of financial assets and lenders want to be compensated for an expected decrease in the purchasing power of these assets (Bascom 1994, p10). The real interest rate is thus the rate adjusted with a due compensation for the anticipated inflation.

McKinnon (1973) and Shaw (1973) maintain that by paying a rate of interest on financial assets that is significantly above the marginal efficiency of investment in existing techniques, one can induce some entrepreneurs to disinvest from inferior processes to permit lending for investments in improved technology and increased scale in other enterprises. The release of resources from inferior uses in the underdeveloped environment is as important as new net saving.

Morrisset (1993) asserts that the most favoured justification for a high interest rates policy in the developing countries is derived from the presence of liquidity constraints on private investment. Policies that impose artificially low interest rate ceilings tend to constrain the supply of capital and lead to an excessive demand for capital relative to what would happen if the deposit interest rate were allowed to find its market-clearing level. Because the principal constraint on investment is the quantity, rather than the cost of financial resources, a rise in interest rates will increase the supply of credit to finance private investment (Morrisset 1993, p.134).

Savings provides the resources for investing in physical capital. So, it is an important growth determinant. Financial liberalisation has been advocated on the grounds of its favourable impact on saving. According to theory, financial liberalisation can affect saving through various channels, which operate in different directions. There is strong evidence of a positive and robust relationship between saving and growth rates. Countries that save more also tend to grow faster (Schmidt-Hebbel and Serven 2002).

Financial liberalisation tends to raise the ratios of private domestic savings to income. Real growth of financial institutions provides more investors with access to borrowing and gives them incentive to save and to accumulate the equity that makes borrowing cheaper. Savings from the foreign sector also respond to liberalisation. The

capital flight of domestic funds is reversed, and there is easier access to foreign capital markets when distortions of such relative prices as interest rates and foreign exchange rates are corrected (Shaw 1973, pp.9-10).

Moreover, saving is often considered beneficial for its financial dimensions. In open economies, raising national savings is a way to reduce the dependence on foreign saving, protecting the economy from external shocks. This is an important policy concern in a world of increasing financial integration. Together with a strong and well-capitalized financial system, saving represents a form of self-insurance to reduce the economy's vulnerability to unexpected reversals of international capital flows. In this manner, saving can help reduce macroeconomic volatility. Countries that have saved more have often benefited from higher growth, and have proved more resilient when facing international financial crises (Schmidt-Hebbel and Serven 2002, p.2).

In the neo-classical growth model, one important channel to increased growth is increased savings rates, and hence investment. Investment increases substantially after liberalisation. An obvious channel for increased investment is a lower cost of capital, brought about by reduced prices of risk and risk exposures. Bekaert and Harvey (2000) and Henry (2000) argue that financial liberalisation leads to lower costs of capital. Bekaert *et al.* (2001) maintain that financial liberalisation increases the investment/GDP ratio with investment partially financed by foreign capital.

Lewis (1992) holds the view that raising interest rates on deposits held in the banking sector will have two beneficial effects - savings effect and portfolio effect. Raising the real return available to income-earners causes consumption to fall and the supply of savings to increase. This savings effect alleviates the chronic shortage of investment resources. An increase in the rate of return to deposits relative to returns for other assets will elicit a portfolio response as wealth-holders move out of other assets into deposits in the banking system (p.152).

While financial liberalisation can affect saving through various potential channels, on the whole its net effect is ambiguous. The international evidence suggests a positive association between financial development and saving across countries. However, empirical studies reveal that the effect of liberalisation on saving is negative. Laeven (2003) argues that financial liberalisation may negatively affect the level of precautionary savings as a result of improved international risk sharing, thereby reducing the overall level of funds available for investment (p.6).

Schmidt-Hebbel and Serven (2002) argue that the sign of the interest rate elasticity of savings is ambiguous, both theoretically and empirically. Higher interest rates increase saving through the substitution effect, but could ultimately reduce the saving rate if the associated income and wealth effects are sufficiently strong. This theoretical ambiguity has not been solved, and the direction of the response of aggregate savings and exogenous increase in the interest rate still remains vastly controversial (p.8).

Financial development leads to higher competition among financial intermediaries and hence decreases the interest rate gap between deposits and loans. This encourages households to borrow more. Thus, as financial reform relaxes credit constraints, increasing the availability of borrowing alternatives, in the aggregate it might reduce rather than increase private savings (Schmidt-Hebbel and Serven 2002p. 10).

Schmidt-Hebbel and Serven (2002) use data for 35 countries for the 1973-1995 period to estimate the correlation between financial liberalisation and savings. They find a positive, significant relationship between financial reform and saving. A higher degree of financial liberalisation is observed in countries that on average save more, although simple association does not reveal anything about the direction of causality (p.12).

Contrary to the view of real interest rate effects on savings, Sarr (2000) argues that commercial banks' ability to lower deposit interest rates can increase deposit mobilization. He argues that interest expenses saved can subsidize and lower fees on checking and branching services and thus help attract deposits.

Fry (1988) notes that the empirical evidence shows that when real deposit interest rates have any significant effect on national savings ratios, the magnitude is of no great policy significance. He argues that only in countries where the real deposit rate is negative by a considerable margin can there be much scope for increasing saving directly by raising the deposit rate (p.453). Sarr (2000) argues that the deposit interest ceiling is not necessarily detrimental to financial deepening, provided the monetary policy is committed to low inflation to avoid substantially negative real deposit interest rates (p.21).

Morisset (1993) argues that a number of factors might influence the relationship between real interest rates, the supply of domestic credits and private investment. He claims that the positive effect on the domestic credit market suggested by McKinnon

and Shaw demonstrates that a policy may be offset by the negative effect of a portfolio shift from capital goods and public bonds into monetary assets. He estimates a model for Argentina over the 1961-1982 period. Argentina has been affected by various interest rates policies during the last twenty years. Simulation results indicate that the quantity of private investment is little responsive to movements in interest rates (Morisset 1993, p.134).

Bandiera *et al.* (2000) examine the effects of different financial liberalisation measures in eight selected countries from 1970-1994. They found that there was no evidence of positive effect of the real interest rate on saving. In most cases the relationship was negative. Bayoumi (1993) examines the effects of financial deregulation on personal saving. He argues that deregulation produces an exogenous short-run fall in saving, some of which is recouped over time. His model is tested using data on the eleven standard regions of the United Kingdom. He argues that an autonomous fall of 2.25 per cent in the personal saving rate may be attributed to deregulation alone.

Jappelli and Pagano (1994) investigate the role of capital markets on aggregate saving and growth. Using a panel of OECD countries for the 1960 to 1987 period, they find that financial deregulation in the 1980s has contributed to the decline in national saving and growth rates in the OECD countries.

Loayza *et al.* (2000) also document that the direct effects of financial liberalisation are detrimental to private saving rates. The real interest rate has a negative impact on the private saving rate. They find that a 1 per cent increase in the real interest rate reduces the private saving rate by 0.25 per cent in the short run.

Reinhart and Tokatlidis (2001) use data from 50 countries consisting of 14 developed and 36 developing ones. Their data spans over the 1970-1998 period. Based on their findings, they argue that with greater certainty, financial liberalisation appears to deliver higher real interest rates, lower investment, but not lower growth. They find that, in some regions savings increased following financial sector reforms; but in the majority of cases, savings declined following the reforms (p.22).

Despite the apparent success of interest rate liberalisation in eliminating investment rationing, on closer examination the results are not as impressive. These more limited real effects arise from the effect of interest rate liberalisation on investment demand. The assumption of zero profits in the banking sector means that

when the interest rate paid to depositors is raised through government action, the borrowing rate must rise as well, in order to avoid large operating losses in the banking sector. The rise of real borrowing costs results in a decline in desired real investment. Therefore, it appears that the negative response of investment to higher borrowing rates swamps the positive effect of higher deposit rates on saving (Lewis 1992, pp.155-156)

Bascom (1994) notes that, in the countries where financial reform has initially been unsuccessful, real interest rates became positive. But, the levels of these rates remained too high or were so volatile that they became a disincentive to domestic investment. Banks extended credit to unproductive enterprises or projects, resulting in large and unsustainable bad debt portfolios, bank failures and business bankruptcies. Eventually, government intervention was necessary to protect depositors and to assist the distressed banks and their borrowers (p.23).

2.3.2 Credit Availability and Reserve Requirement

As mentioned earlier, financial liberalisation entails the abolition of ceiling and other controls on credit. Direct government intervention in bank credit decisions is brought to an end. Under the repressed financial system, households and firms cannot borrow the funds in the amount needed by them, due to the existence of credit ceilings. Thus, the household and firms face an explicit financial constraint. On the other hand, banks are directed to extend cheap credit to a particular sector.

McKinnon (1973) and Shaw (1973) believed that artificially low-cost loans or subsidized credit programs might be both unnecessary and unwise. Cheap credit may not benefit the poor at all, as it may effectively prevent them from competing for long-term finance from the organized banking system, and as a result, they are confined to getting credit from the village shopkeeper. So, it has been argued that the policy of providing cheap bank credit to a few favoured borrowers, or small dribbles to a larger number, would have to be discontinued.

Bascom (1994) asserts that credit rationing schemes are unlikely to match available resources with the most productive investments. Instead, resources end up financing government deficits or flow into capital-intensive projects undertaken by a few large firms whose domestic markets are protected by trade restrictions. Small and medium-sized enterprises are often forced to seek out credit from the informal

unregulated financial markets or, in the absence of access to both domestic and international financial markets, increasingly rely on self-financing.

Moreover, in a regulated market, bank managers and loan officers face such a excessive demand for credit that they are not forced by competition to market their product, or to select among competing borrowers or projects on the basis of risk, including ability to repay, and rates of return (Bascom 1994, pp. 17-18).

Caprio *et al.* (2001) point out that direction of credit, especially through state-owned banks, reduces the incentive for market-driven financial intermediaries to investigate projects and to select those most likely to have an adequate risk-adjusted return. It also reduces the motivation to recover delinquent loans and diverts official supervision from prudential consideration to verifying compliance with the credit allocation policy. They also argue that the financial repression process rarely helped distributional goals. The wealthy and well placed, including bank owners, management, and staff often collected most of the rents that the ceilings created. The ceilings also generated a potential for abuse and corruption (pp. 6-7).

Financial liberalisation also entails relaxation of high reserve requirements. High reserve ratio ensures a ready demand for government securities that help to finance government deficits at ceiling interest rates. Monetary expansion connected with government financing its deficit by borrowing from the central bank contributes to inflationary pressures, or increased inflation tax (Bascom 1994, pp.19-20). The relaxation of reserve requirements leads to an increase in the loan volumes to private entrepreneurs from the banking sector since part of the reserve maintained by the banks to meet the reserve ratio can be used for lending.

Removal of credit ceilings as well as relaxing other controls like direction of credit to the particular sector enables the banking sector to evaluate the projects and extend loans to the high yielding ones. Financial constraints of households and firms are eliminated with the removal of credit controls. A higher real interest rate leads to channelling of funds from informal markets to the formal banking system.

The McKinnon-Shaw school believes that financial liberalisation increases the total credit available to the private sector through various channels. In contrast, a group of economists called neo-structuralists argue that financial liberalisation reduces the total supply of credit to the businesses. They claim that due to the reserve requirement in the banking system, entire funds channelled from curb market to formal banking

system cannot be loaned out (van Wijnbergen 1982, 1983; Buffie 1984). Cho (1990) disputes the view of the neo-structuralists by arguing that not only banks, but also the informal credit markets have to hold some reserve funds if they provide intermediation, i.e., lending through collecting deposits, similar to that of banks. This view clearly suggests that the total credit supply does not decrease due to reserve requirements in the banking system.

2.3.3 Securities Market Development

Securities market development is another important aspect of financial liberalisation. As liberalisation proceeds, banks cease to dominate the entire financial system. Securities markets emerge and become an increasingly important source of funds for many firms. Since the late 1980s, many emerging market countries have amended their laws to allow foreigners to legally invest in their equity markets. As a result, foreign portfolio investment into emerging markets increased dramatically. The foreign inflow of capital also helped spark a boom in emerging securities prices (Kawakatsu and Morey 1999; Henry 2000).

Laeven (2000) argues that equity market liberalisation has a double effect; it directly reduces financing constraints in the sense that more foreign capital becomes available, and foreign investors may insist on better corporate governance that indirectly reduces the wedge between internal finance and external finance. Hence, the cost of capital may go down because of improved risk sharing, or because of the reduction in financing constraints or both.

Bekaert *et al.* (2001) document that equity market liberalisation, on average, leads to a one per cent increase in annual real economic growth over a five-year period. Open capital markets may mean more efficient markets, and generally an increase in financial development. They decompose GDP into proportions due to investment, consumption, government and the trade sector, and report that investment to GDP rises after capital market liberalisation. Financial liberalisation may affect economic growth by reducing capital market imperfections, which might in turn reduce the external finance premium (Bekaert *et al.* 2001, p.3).

Levine and Zervos (1998) study whether stock market and banks promote economic growth. They find that measures of market liquidity are strongly related to

growth, capital accumulation, and productivity, while surprisingly, more traditional measures of development such as stock market size are not robustly correlated.

Kaminsky and Schmukler (2003) examine the short and long run effects of financial liberalisation on capital markets. They assemble a comprehensive database on financial liberalisation for 28 countries for the period January 1973 to June 1999. Their results indicate that financial liberalisation is followed by more pronounced boom-bust cycles in the short run. However, financial liberalisation leads to more stable markets in the long run.

The efficient markets hypothesis in finance suggests that as markets are made more open to the public, prices should come to reflect the increased availability of information and be more efficiently priced. But Kawakatsu and Morey (1999) find little evidence in the data that liberalisation has changed the behaviour of emerging stock market prices. They employ data from nine different countries for the period 1976 to 1997. Their tests applied to emerging market price indices do not provide evidence that markets became efficient by their opening to foreign investors. In fact, most of their statistical tests indicate that the markets were already efficient prior to the actual liberalisation (p.353).

They, however, do not take this as evidence that liberalisation has no effect on market efficiency and that there is no need for liberalisation. They argue that their statistical results indicate that the markets were already efficient prior to the actual opening date, which suggests the effect of forward-looking investors (Kawakatsu and Morey 1999, p.368).

Opponents of financial liberalisation hold the view that foreign investments toward emerging markets are extremely volatile and depend on changing economic conditions. A consequence of volatile investment flows is a high volatility in stock prices. The empirical implication is that market volatility should increase after liberalisation. In contrast, Domowitz *et al.* (1998) show that liberalisation may induce greater participation by foreign investors, whose entry can reduce price volatility. New investors broaden the market, which in turn dampens the shocks on prices from order transactions. Foreign investors may also make prices more efficient by increasing the accuracy of public information regarding fundamental values (De Santis and Imrohoroglu 1997).

Levine and Zervos (1998) studied the empirical relationship between various measures of stock market development, banking development, and long run economic growth. They find that, even after controlling many factors associated with growth, stock market liquidity and banking development are both positively and robustly correlated with contemporaneous and future rates of economic growth, capital accumulation, and productivity growth. Their findings suggest that banks provided different financial services from those provided by stock markets.

2.3.4 Liberalising External Account and Capital Flow

While internal financial reform policies focus on the liberalisation of domestic financial markets, external financial reform policies are concerned mainly with current and capital account convertibility. Current account convertibility permits the free exchange of a country's currency for foreign currencies to finance international transactions in goods, services, and unrequited transfers. Capital account convertibility refers to the removal of controls on capital movements, or the opening of the capital account of the balance of payments (Bascom 1994, p.69).

Many developing countries have liberalised their financial markets and, in addition, opened up their capital accounts in the course of their financial reforms. An expected consequence of this step is an improved access to international financial markets. Potentially, there are many gains from increased financial integration. For instance, international capital mobility is crucial to global resource allocation, since it helps to smooth consumption and reduce risk.

International capital mobility also allows for investment, and hence growth, beyond the premises of domestic saving. Theoretically at least, unrestricted capital flows facilitate specialization in the production of financial services, and so benefit the international economy. Competition from abroad is introduced and innovation is stimulated. Under the circumstances that the global financial market is able to properly price the risks and returns inherent in financial claims, global saving can be allocated to the most productive investments. Thus, there are potentially important welfare gains to be made from external financial liberalisation (Isaksson 2001, p.310).

Reinhart and Tokatlidis (2001) argue that financial liberalisation appears to deliver a higher level of foreign direct investment and high gross capital flows. Beginning from the early 1990s, a massive amount of capital flowed into South East

Asian countries, as restrictions were lifted gradually. International capital investment accounts for sizable proportions of national GDPs in these countries, e.g., 11 per cent for Malaysia, 10 per cent for Thailand, 5 per cent for Indonesia, and 4 per cent for South Korea (Huang and Yang 2000).

Sarr (2000) argues that the ability to pay low deposit interest rates is necessary for subsidized services to occur, which has implications for early capital account liberalisation. Such liberalisation, by aligning deposit interest rates with world interest rates may reduce domestic financial deepening potential. Given the potential unwillingness of depositors to pay higher service charges to cover operating costs, high deposit interest rates and short term foreign borrowing are likely to be the options banks will choose to fund their lending activities. These options, in turn, may lead to banking crises as macroeconomic conditions – e.g., exchange rate movements – directly affect bank's open foreign exchange positions (Sarr 2000, p.21).

McKinnon and Pill (1999) present a framework where liberalisation may lead to bouts of over-borrowing. This over-borrowing syndrome may be magnified when domestic liberalisation is coupled with liberalisation of the capital account. Furthermore, if the rising levels of debt are denominated in a foreign currency, this will increase a country's vulnerability to exchange rate fluctuation.

Rajan and Zingales (1998) and Galindo *et al.* (2002) argue that financial development facilitates economic growth by reducing the costs of external finance to firms. Specifically, industrial sectors that are relatively more in need of external finance develop disproportionately faster in countries with more-developed financial markets.

Bekaert *et al.* (2000) argue that a capital inflow leads to a permanent positive price effect. Similarly, Bekaert and Harvey (2000) and Henry (2000) indicate that investment increases as a result of capital inflow. If the additional investment is efficient, economic growth should increase. However, in the aftermath of the Asian financial crises, some economists felt foreign capital had been wasted on frivolous consumption and wasteful investment, undermining the benefits of financial liberalisation (Bekaert and Harvey 2001, pp. 1-2).

Isaksson (2001) tries to gauge the degree of international capital mobility and determine whether financial liberalisation in developing countries has enhanced access to the international financial markets. To do this, he uses a dataset that runs from 1975 to 1995 and that consists of 90 developing countries from Africa, Asia, Latin America,

and the Middle East. The result shows that although the overall capital mobility is low, the access to international financial markets improves as a result of financial liberalisation (Isaksson 2001, p.335).

Gruben and McLeod (2002) present evidence from over 100 countries that suggests a strong link between capital account openness and lower inflation. They argue that full capital account liberalisation is associated with a 3-6 per cent fall in average inflation rates. They use the data for 112 countries for the 1973-1989 period (p.225).

Eichengreen and Mussa (1998) believe that capital account liberalisation and financial liberalisation more generally are inevitable for countries that wish to take advantage of the substantial benefits from participating in the open world economic system. They also recognize that as liberalized systems afford opportunities for individuals, enterprises, and financial institutions to undertake greater and sometimes imprudent risks, they create the potential for systemic disturbances.

Lensink *et al.* (1998) assess the effects of financial liberalisation on capital flight in African economies. A portfolio model, in which capital flight is one of the assets, is estimated on a sample of nine African countries for 1970-91. Their estimation results suggest that financial liberalisation induces a reduction in capital flight.

2.3.5 Financial Liberalisation and Allocative Efficiency

McKinnon (1973) and Shaw (1973) argue that interest rate ceilings distort the allocation of credit and may lead to under investment in projects that are risky, but have a high-expected rate of return. Similarly, directed credit programs are often associated with a misallocation of funds. They recommended deregulation of interest rates with a belief that a high real interest rate will not only increase the savings and investment rate, but will also help direct the available funds to the most productive projects. This view suggests that financial reforms improve the allocative efficiency of savings.

Bekaert *et al.* (2001) claim that from increasing investment, financial liberalisation may improve the efficiency of capital allocation. An obvious channel through which this could occur is the financial development and improved market efficiency the liberalisation might bring about.

Wurgler (2000) demonstrates an empirical link between financial development and the efficiency of capital allocation. He shows that countries with developed financial sectors increase investment more in their growing industries and decrease

investment more in their declining industries than those with undeveloped financial sectors.

Greenwood and Jovanovic (1990) argue that financial intermediaries can invest more productively than individuals in the curb markets because of their better ability to identify investment opportunities. So, a formal financial market promotes growth because it allows a higher rate of return to be earned on capital, and growth in turn provides the means to implement costly financial structures. Financial development, in the form of better accounting and disclosure rules, and better corporate governance through institutions, will reduce the wedge between the cost of internal and external funds and enhance growth, especially for firms that are most reliant on external financing.

In contrast, the neostructuralists claim that the official banking sector is less efficient than the financial markets outside of it, such as informal credit markets in intermediating financial resources. They argue that informal credit markets provide complete intermediation, while banks are absorbing some funds for reserve requirements (van Wijnbergen 1983; Buffie 1984).

Cho (1990) challenges the claim of the neostructuralists by arguing that the efficiency of credit allocation by informal credit markets is limited by their narrower information base. The customers of specific lenders in informal credit markets are usually limited to a small group of borrowers whose credibility is determined by their location and by private information networks. These characteristics of informal credit markets limit their capacity to allocate credit efficiently. Informal credit markets also fail, like repressed banks, to identify productive borrowers well and to finance lumpy investments that can exploit economies of scale. Furthermore, as the degree of risk pooling is limited, and their loans are poorly protected, the interest rate of informal credit markets is usually extremely high, which reflects a high-risk premium. Since a low interest rate leads to an inefficient allocation of credit, the extremely high interest rate, which may far exceed the productivity of borrowers, also leads to inefficient allocation. In light of these factors, it seems obvious that the banking sector can allocate credit more efficiently if the interest rate ceilings are eliminated, or if ceilings are increased to reflect market conditions (Cho 1990, p.479).

Galindo *et al.* (2001) investigate whether financial liberalisation has increased the share of investment going to firms with a higher marginal return to capital. To this

end, they develop a summary index of the efficiency of the allocation of investment. They then examine the relationship between this index and various measures of financial liberalisation. The results suggest that in the majority of cases financial reform has led to an increase in the efficiency with which investment funds are allocated. Their empirical investigation is based on firm level panel data for 12 developing countries for the 1990 – 1998 period. Their results provide empirical support for the idea that financial liberalisation has led to an improvement in the efficiency with which investment funds have been allocated. The results strongly support a positive, significant and strong effect of financial liberalisation on the efficiency with which investment funds are allocated (Galindo *et al.* 2001, p.22).

Gupta and Lensink (1996) examine the effects of financial liberalisation on allocative efficiency. The allocative efficiency is assumed to be affected if deregulation leads to a reallocation of a given amount of investments between the two sectors. It is argued that higher interest rates would induce the selection of projects with higher rates of return, thus raising the average productivity of investment, and hence growth, even if the effect on savings was negligible (Gupta and Lensink 1996, p.36).

King and Levine (1993b) argue that a more developed financial system fosters productivity improvements by choosing higher quality entrepreneurs and projects, by more effectively mobilizing external financing for these entrepreneurs, by providing superior vehicles for diversifying the risk of innovative activities, and by revealing more accurately the potentially large profits associated with the uncertain business of innovation. In these ways, better financial systems stimulate economic growth by accelerating the rate of productivity enhancement (King and Levine 1993b).

2.3.6 Financial Intermediation

McKinnon-Shaw school advocated financial liberalisation also on the grounds that it creates efficiency gains through increased financial intermediation by the formal financial sector. Generally, financial development is the prerequisite for increased financial intermediation. Financial liberalisation is thought to be associated with increased financial development that reduces the imperfections of financial markets, resulting in a reduction in the cost of capital and an increase in the level of investment. Increased financial development in turn has been shown to enhance economic growth (King and Levine 1993a; Beck, Levine *et al.* 2000).

Rajan and Zingales (1998) show that financially constrained industries grow faster in more financially developed countries. Laeven (2003) documents that the liberalisation of the banking sector reduces the imperfections firms face when dealing with financial markets. Equity market liberalisation directly reduces financing constraints in the sense that more foreign capital becomes available. Foreign investors may insist on better corporate governance, which helps reduce the wedge between internal finance and external finance. Hence, the cost of capital may go down because of improved risk sharing and the reduction in financing constraints (Bekaert, Harvey *et al.* 2001, p.4).

Financial liberalisation provides market forces a dominant role in setting financial asset prices and returns, allocating credit, and developing a wider array of financial instruments and intermediaries. All these changes are aimed at improving the efficiency of financial intermediation, raising saving and investment, improving the efficiency of investment, and spurring growth. Financial reform, translated into more developed financial intermediation, alters significantly a country's financial system. (Schmidt-Hebbel and Servén 2002).

Schmidt-Hebbel and Servén (2002) further claim that financial development can imply an increase not only in the availability of credit funds and instruments, but also in saving instruments and devices. A deeper financial system should be capable of providing alternative saving instruments that more adequately match individual preferences, risk-aversion and income profiles. Credibility in the soundness and sustainability of banks, for example, should increase the incentives for households to participate in the financial system (Schmidt-Hebbel and Servén 2002, p.10).

In the process of financial liberalisation, the size of the financial system is widened as new banks and financial institutions enter into the system. It is also thought that rapid branch extensions take place. Fry (1988) notes: "the small amount of empirical evidence on branch proximity suggests that increased branch proximity has raised national saving ratios substantially (by 1 to 5 percentage points over a 20 year period) in six Asian developing countries (Fry 1988, p.453)."

Reinhart and Tokatlidis (2001) use data from 50 countries- consisting 14 developed and 36 developing countries- for the 1970-1998 period. They argue that financial liberalisation also enhances financial deepening by providing greater access to internal capital markets.

Galindo *et al.* (2002) argue that financial liberalisation is an instrument that, under certain conditions, promotes financial sector development and through it can stimulate the relative growth rate of sectors that rely on external funding. In order to promote development, though, other structural reforms that support the proper behaviour of financial markets have to be in place. Hence, even if systems reach full liberalisation, the impact of liberalisation on domestic credit market growth can be null if rules and institutions that support creditor rights are not in place. If the proper legal set-up is in place, the impact of liberalisation on growth can be notable (pp.26-28).

Pill and Pradhan (1997) claim that by following financial liberalisation, market determination of interest rates should result in modestly positive real interest rates. These, in turn, will increase the resources available to the financial system, since bank deposits offering a competitive return will attract savings that were previously held outside the formal financial sector. Moreover, positive real interest rates will provide an incentive for borrowers to invest in more productive activities, thereby improving the productivity of the economy as a whole. Consequently, financial liberalisation should lead to an increase in both the quantity and the quality of financial intermediation by the banking system (Pill and Pradhan 1997, p.8).

Since the mid-1970s, several Latin American and Asian countries have implemented financial reform policies aimed at reducing government control and eliminating distortions in the financial sector. The outcome of these policies, however, has not been uniform. The success and failure of financial liberalisation programs is said to be dependent on the proper sequencing of the liberalisation process. In the following section this aspect of liberalisation will be discussed.

2.4 Sequencing of Financial Liberalisation Process

McKinnon (1991) argues that the sequencing of the liberalisation process is of critical importance. In his view there is an optimal order of liberalisation, which may vary for different liberalizing economies depending on their initial conditions. According to him, governments should not undertake all liberalizing measures simultaneously (p.4).

The optimal order of liberalisation advocated by McKinnon consists of balancing government's finances in the first place. In other words, fiscal control should precede financial liberalisation. Second in the order of liberalisation is the opening of

the domestic capital market so that depositors receive, and borrowers pay, substantial real interest rates. But, unrestricted borrowing and lending can only proceed satisfactorily once the price level is stabilized and fiscal deficits are eliminated. Similarly, the banking system should be freed to set interest rates on deposits and loans, and freed from heavy reserve requirements (McKinnon 1991, pp. 4-6).

After the liberalisation of domestic trade and finance, there is an appropriate pace for the liberalisation of the foreign exchanges. On the balance of payments side, current accounts should be liberalized first and foreign exchange convertibility on capital account should be the last stage in the optimal order of liberalisation. The premature elimination of exchange controls on foreign capital flows could lead to unwarranted capital flight, or an unwarranted build-up of foreign indebtedness, or both. (McKinnon 1991, pp. 7-10).

Kaminsky and Schmukler (2003) find that the pattern of liberalisation varies across regions, with developed countries liberalizing their stock markets first and developing economies opening their domestic financial sector first (p.37). They argue that liberalisation unveils new problems in the banking system as protected domestic banks suddenly get access to new sources of funding triggering protracted financial booms. During financial repression, banks are protected from outside competition, badly regulated, and badly supervised and do not have the pressure to run efficiently. In such a scenario, a standard recommendation on sequencing is to first clean up domestic financial institutions and change government institutions, then deregulate the industry and open up the capital account (p.33).

Schmidt-Hebbel and Servén (2002) claim that excessively rapid financial reform often leads to unsustainable credit and activity booms, which then lead to financial crises. These risks increase significantly in the absence of prudential regulation and strong supervision of banks and other liberalized capital market segments (p.7).

Girma (2003) notes that premature liberalisation of the financial sector could have a devastating impact on national economy, as is evidenced by the financial crisis in East Asian countries. He argues that in such a context, a gradual and cautious move towards liberalizing the financial sector in developing countries is not a choice but a necessity (p.5).

Mehran and Laurens (1997) assert that the speed of liberalisation needs to be determined in the context of a country's overall reform program. Financial sector

reforms need to be supported by structural reforms in other economic sectors. Countries with serious macroeconomic and financial imbalances, or inadequate regulatory and supervisory frameworks, or whose financial institutions are insolvent, are likely to run into serious problems if they liberalize interest rates too early or too rapidly. If liberalisation is premature, controls on interest rates may need to be reintroduced. Thus, the better the fundamentals, the faster a country can go with interest rate reform (p.33).

Liberalizing too fast poses certain dangers- but too slow a pace can also defeat reform programs. Reforms may lose momentum and new distortions could emerge if liberalisation takes too long. In determining the appropriate sequencing of interest rate liberalisation, the authorities need to distinguish not only between loan and deposit transactions, but also between wholesale and retail transactions. Interest rates on wholesale transactions between sophisticated entities should be liberalised first, followed by lending rates and, lastly, deposit rates. This gradual approach safeguards the profitability of banks while allowing time for people and firms to adjust to liberalisation (Mehran and Laurens 1997, p. 34).

Pill and Pradhan (1997) hold the view that if financial reforms are to succeed, they must be implemented in an appropriate macroeconomic, financial, and institutional environment. Macroeconomic stability is a prerequisite for successful financial liberalisation. In the generally successful cases, macroeconomic imbalances were largely eliminated, balance of payments and fiscal deficits were manageable, and inflation was relatively low before financial reforms were introduced. While macroeconomic stability is essential for successful financial liberalisation, a sound banking system is also extremely important. The benefits associated with financial reform are contingent on the financial system being “well behaved” throughout the liberalisation process (Pill and Pradhan 1997, pp. 7-8).

Similarly, if competition among banks in the newly deregulated financial sector is weak, liberalisation may result in lower real deposit rates rather than the anticipated movement toward modestly positive, equilibrium levels. Monopolistic banks can exploit the opportunity offered by the abolition of interest rate controls to widen the margins between their deposit and lending rates, in order to increase profits. When financial deregulation is implemented and especially where non-performing loans are inherited from the pre-reform era, interest rate liberalisation should be accompanied by structural reforms including restructuring bank balance sheets to remove bad debt, privatising

publicly owned banks, and introducing measures to promote competition in the banking sector (Pill and Pradhan 1997).

Financial liberalisation also creates opportunities for banks to make poor lending decisions. If, prior to reform, banks have not made loans based on market criteria, their ability to manage credit evaluation and allocation is likely to have either atrophied or never been developed. Newly liberalized banks may therefore be prone to making poor lending decisions. Therefore, strengthening the management and risk evaluation capabilities of bank managers in a newly liberalized environment should be an integral part of the liberalisation process (Pill and Pradhan 1997, p 9).

Wyplosz (2002) describes three different strategies – wait, buckle up, and one step at a time – to reap the benefits of liberalisation with minimal costs. In his opinion, most countries will eventually liberalize, but this needs to be done as a matter of priority. The effects of liberalisation in the developing and the developed countries suggest that it may be useful to wait until a proper economic, and, possibly political infrastructure has been built. Liberalisation is also a source of widespread instability. Therefore, it is important to set up adequate welfare systems before liberalizing. Free markets may raise efficiency, but, at least initially, they are known to increase inequality. The boom years must be used to prepare for the bust years. The most delicate steps are the liberalisation of the domestic financial markets and of the capital account. Spacing out these steps over several years seems reasonable (Wyplosz 2002, p.21).

Bascom (1994) finds that price stability – or, more broadly, macroeconomic stability – is important for a successful financial reform program. The control of inflation has been a determining factor in achieving sustainable levels of positive real interest rates. Effective inflation control, however, depends on the ability of the government to control monetary expansion, which in turn depends, among other things, on the condition and financing of the government's budget deficit (pp. 35-36).

The capital account may be liberalized after domestic interest rates are made competitive with international interest rates. However, in an inflationary environment, if domestic financial market reforms are to be considered credible and sustainable, the fiscal deficit must first be controlled. Large fiscal deficits financed by monetary expansion or inflation tax would require the central bank to keep the level of domestic

interest rates low while imposing high reserve requirements on commercial banks (Bascom 1994, p.70).

According to Bascom (1994) a principle of reform sequencing is that international capital controls should only be lifted after the domestic financial market has been satisfactorily reformed and domestic interest rates have been increased to internationally competitive levels. In turn, the level of domestic interest rates can be increased only after the fiscal deficit is under control (1994, p.71).

Another set of reform sequencing issues relates to the liberalisation of the capital and current accounts, including the reduction of tariffs and removal of capital controls. Some countries have followed different sequencing paths in implementing their capital and current account liberalisation policies. With the fiscal deficit under control, domestic financial markets liberalized, and domestic real interest rates established at internationally competitive levels, the opening of the capital account would tend to generate significant capital inflows. A successful current account liberalisation policy that may include a reduction of import tariffs, an elimination of import quotas, and currency convertibility, generally requires a real exchange rate depreciation to assist the transition to the tradable-goods sector from a protective to a liberalized environment. Thus, in most cases, the capital and current accounts should not be simultaneously liberalized (Bascom 1994, p.71).

The above discussion suggests that the speed and the sequencing of financial liberalisation process is important in order to reap the fruits of liberalisation, but varies across countries depending upon their initial economic conditions. In general, liberalisation measures, when taken in a favourable policy environment, have considerable advantages to promote and sustain long-term economic growth.

2.5 Financial Liberalisation and Welfare

One of the major drawbacks of financial liberalisation cited frequently by the critics of liberalisation is that it ignores welfare and leads to unequal distribution of income. Under the financial liberalisation process, market becomes dominant, competition prevails in the market, government subsidies are cut, and the deprived sector and the strategically important sector, e.g., manufacturing industries, no longer get government protection. As a result, the deprived sector becomes more deprived and the sector needing preferential treatment in the initial period cannot be developed.

In contrast, the proponents and supporters of financial liberalisation advocate that the policy enhances welfare and equalises the distribution of income. Some economists, on the other hand, claim that the effects of financial liberalisation on welfare are ambiguous.

Welfare, in simple terms, encompasses employment opportunities, appropriate level of wages, supply of essential goods and services to the general public, and the like. In a poverty-ridden economy, reducing the incidence of poverty also may come under welfare. Similarly, redistribution of national income also is viewed to be closely related to welfare.

Shaw (1973) claims that financial liberalisation contributes to the stability of growth in output and employment. A rise in interest rates and foreign-exchange rates relative to wage rates may both raise employment and increase the wage share of income. Thus, financial liberalisation tends to equalize the distribution of income (p. 11).

Edwards (1989) argues that since tariffs are always welfare reducing, the financial liberalisation which involves the elimination or reduction of tariffs is welfare increasing. Reducing the extent of regulations in specific sectors, reducing the extent of labour market distortions, and relaxing the capital controls altogether will increase the employment opportunities, and total unemployment will decline. As a result, the net effect of these reforms will be welfare increasing (p. 60).

Kahkonen (1987) also possesses similar views. He argues that lowering lending rates and relaxing capital controls increases investment and thereby improves welfare. Therefore, complete financial liberalisation increases welfare unambiguously. Partial liberalisation, as he claims may cause welfare losses in the short run because raising the artificially low domestic deposit rate in the presence of tariffs increases savings but worsens intertemporal allocation by causing oversaving (pp. 539-540).

Edwards and van Wijnbergen (1986) relate domestic financial liberalisation with external sector liberalisation. They claim that trade tariff reductions increase welfare unambiguously only if the domestic financial market is unregulated, and raising the deposit rate will unambiguously cause welfare gains only under free trade. If the capital account is liberalized in the presence of trade distortions, welfare can be negatively affected. The reason for this is that if the funds obtained from abroad are used to increase investment, the pre-existing distortion will be amplified (p. 147).

Krueger (1986) argues that welfare could be improved by liberalizing the financial market and permitting the real interest rate to become positive. Since exchange rate overvaluation and artificially low nominal interest rates tend to work in the same direction, and encourage the introduction of overly capital-intensive activities relative to efficient resource allocation, there is a presumption that moving either the exchange rate or the interest rate in an appropriate direction is likely to improve welfare (p. 24). Krueger also claims that reforms in labour market and freeing up agricultural prices to bring them more closely in line with relative prices available on the international market are likely to be welfare-improving (p.23).

Bhattarai (1998) claims that financial liberalisation improves the distribution of income by raising the wage rate of rural labour. Rural labour intensive sectors invest more with increased access to financial institutions and demand more labour to complement additional capital employed in these sectors. More additional demand for unskilled labour than for the skilled labour causes a rise in the ratio of the rural to urban wage rate significantly in the liberalized regime. Over time, redistribution occurs through the labour market and ultimately results in larger welfare gains for rural households than for urban households (p.1).

Battle (1997) on the other hand, argues that financial liberalisation has an ambiguous effect on welfare. The direct effect of an increase in the deposit rate is welfare improving because, with a low initial tariff, savings increase from a level that was previously suboptimal. Since a higher deposit rate causes a transfer of income from expenditure to savings, the demand for non-traded goods will decrease. The excess supply due to price rigidity will worsen, thus, the effect on welfare will become negative. Additionally, since consumption falls, aggregate employment will fall causing welfare deterioration (p.286).

Edwards (1986) argues that even if a liberalisation process results in an overall welfare gain, there are sectors that will gain and sectors that will lose from it. According to him, as a result of trade liberalisation that is a by product of financial liberalisation, production of exportables and nontradables will increase, production of importables will decline, and wages relative to all goods will increase. Increased wages means a welfare gain; thus trade liberalisation is welfare improving.

Daitoh (2003) claims that financial liberalisation in developing countries may aggravate welfare unless the liberalisation reform in the labour market proceeds in

advance, or at least simultaneously. Under the repressed financial system, the wage rates tend to be artificially high and the interest rates tend to be artificially low. Under the low interest rate policy, the urban unemployment declines. The policy of liberalisation increases the interest rate, but does not reduce the artificially high wage rate, which results in increased unemployment (p.16).

Wyplosz (2002) holds the view that free markets may raise efficiency but, at least initially, they are known to increase inequality. Therefore it is important to set up adequate welfare systems before liberalising the financial system.

Fry (1988) asserts that financial repression in the form of consumer borrowing constraints may improve welfare. The distortionary welfare loss created by the borrowing constraint is offset by faster growth that in turn increases the wage. This welfare gain grows over time while the distortionary loss remains constant. Hence welfare loss is unlikely to outweigh welfare gain except for the initial generation (p. 123)

Mesa-Lago (1997) studied the effects of financial liberalisation in eight Latin American countries for the 1980-90 period. He documents that the implementation of economic restructuring policies in the fiscal crisis period resulting from a heavy debt burden has resulted in welfare loss in this region. After the implementation of liberalisation policies the regional GDP per capita declined, the real minimum wages in urban areas declined, the open unemployment rate in urban areas rapidly increased, the poverty incidence for the population increased, the regional average rate of inflation increased 26 times, and public expenditures in social services were cut, afflicting the most vulnerable segments of the population (pp. 500-501).

Mesa-Lago (1997) claims that capital and business mainly benefited from economic reform, but labour and the poor mostly suffered from the effects of that reform due to the rising unemployment, shrinking real minimum wages and pensions, increase in prices of essential consumer goods, reduction in social services, and expanding poverty and income inequality.

The above discussion shows that there is no unanimous view about the welfare and income distribution effects of financial liberalisation. The policy of financial repression as discussed earlier was justified under the grounds of welfare and equal distribution of income, but that policy could not achieve those objectives. Financial

liberalisation emphasises increased competition and output growth; so it is obvious that the welfare aspect is not its main objective.

2.6 Financial Liberalisation and Financial Fragility

Theoretical models predict that financial liberalisation can promote economic development, by increasing saving, investment, and the productivity of capital. However, much of the evidence from financial liberalisation episodes from both developing and developed economies points to significant destabilizing consequences, including incidents of severe financial crises. The implementation of financial liberalisation programs, especially in developing countries with weak institutions, has created many more problems than it has solved (Arestis and Demetriades 1999, p. 441).

Increasing openness and economic liberalisation have been credited with fostering higher growth and record capital inflows in many emerging market countries. For many countries, especially in Asia but to some extent also in Latin America, the first part of the 1990s was characterized by considerable optimism and buoyant growth. However, recent financial crises, beginning with Mexico in 1994-1995, the Asian crisis of 1997-1998, and the crises in Russia, Brazil and several other Latin American countries in 1998-1999 have tempered this optimism (Glick *et al.* 2001, p.1).

Weller (1999) argues that emerging economies are becoming more susceptible to both currency and banking crises after financial liberalisation. She uses data for 27 emerging economies from 1973 to 1998. Her analysis indicates that the likelihood of currency crises may increase with stronger reactions to financial variables than to real or external trade variables. Similarly, as financial liberalisation creates more competitive pressures for domestic banks, financial fragility may result from increased international financial competition. It may simply help to create an optimistic overall outlook in an initial 'deregulation euphoria' which breeds expansion of credit for projects of lesser quality (p. 69).

Weller (1999) suggests that liberalizing economies should focus on setting up the necessary stabilizing institutions before opening their economies, as they are likely to experience an increase in the likelihood of banking and currency crises without countervailing measures (p. 76).

Demirguc-Kunt and Detragiache (2001) argue that financial liberalisation increases financial fragility by giving banks and other financial intermediaries more

freedom to take on risk. The risk of bank insolvency and, more generally, of systemic banking crises may be greater in liberalized financial systems (p. 96).

Demirguc-Kunt and Detragiache (2001) study the impact of financial liberalisation on financial fragility using a data set for 53 developed and developing countries during the 1980-95 period (p. 99). Their study shows that financial liberalisation is a significant factor leading to banking sector fragility. This effect is at work even after controlling for variables capturing the state of the macroeconomy. This suggests that, even if it is carried out after macroeconomic stabilization is achieved, financial liberalisation still increases financial fragility (p. 105).

The main reason behind increased banking sector fragility is that the removal of interest rate ceilings and the reduction of barriers to entry reduce bank franchise values, thus exacerbating moral hazard problems. Interest rate ceilings and entry restrictions create rents that make a banking license more valuable to the holder. It is the risk of losing this valuable license, which induces banks to become more stable institutions, with better incentives to monitor the firms they finance and manage the risk of their loan portfolio. Thus, when a reform – such as financial liberalisation – leads to increased bank competition and lower profits, this erodes franchise values, distorting the risk-taking incentives of the institution. Unless the reform effort incorporates an adequate strengthening of prudential regulations and supervision to realign incentives, lower franchise values are likely to lead to increased fragility (Demirguc-Kunt and Detragiache 2001, p. 110).

Arphasil (2001) asserts that financial liberalisation exposes threats to financial stability through capital movements. It allows financial intermediaries to gain easy access to risky investments and to misallocate resources. The liberalisation of interest rates and capital account transactions lead to a credit boom, mostly financed by short-term borrowings from abroad. Such a boom built on an unstable foundation ultimately leads to financial crisis as shown by the experience of the East Asian crisis during 1997-1998.

Arestis and Demetriades (1999) argues that increased short-term capital inflows have a number of destabilizing consequences. First, they are a direct source of macroeconomic instability by putting upward pressure on the exchange rate of the receiving country. Second, capital inflows inflate asset prices, and therefore have positive wealth effects, which contribute to increased imports and inflation (P.450).

Chin and Jomo (2001) and Arestis and Demetriades (1999) support the view that financial liberalisation increases financial fragility even if it is carried out after macroeconomic stabilization is achieved. The East Asian crises, in which the initial macroeconomic conditions were very favourable, have vividly shown that even in the best of circumstances, financial liberalisation remains a treacherous policy exercise. Liberalisation undermines effective financial governance, both at the international and national levels, increasing the vulnerability of the system to crisis.

Wyplosz (2002) uses data from 27 developing and developed countries for the sample period 1977-1999, to examine whether financial liberalisation is hazardous. His finding is that financial liberalisation is considerably more destabilizing in developing countries than in developed countries. Following financial liberalisation, developing countries tend to go through a boom-bust cycle (p. 3).

Wyplosz views liberalisation as a source of macroeconomic instability since it increases exchange rate volatility. He argues that many countries in Europe and Asia have been able to grow fast over decades while retaining heavy-handed financial restraints. This alone shows that there is no urgency to undertake liberalisation. And when it is being taken, it should be approached with great caution (p. 22).

Mishkin (1999) argues that financial deregulation and liberalisation often leads to lending booms, both because of increased opportunities for bank lending, and also because of financial deepening in which more funds flow into the banking system. Although liberalisation and financial deepening are positive developments for the economy in the long run, in the short run, the lending boom may outstrip the available information resources in the financial system, helping to promote a financial collapse in the future. Lending booms have been a feature of financial liberalisation in many countries and have often been followed by banking crises (pp. 1530-31).

Crotty and Lee (2002) argue that misconceived financial liberalisation was the proximate cause of the East Asian financial crisis of 1997. Traditional state-guided bank-based financial systems, insulated from international financial markets through tight capital controls, were perhaps the institutions most responsible for the East Asian economic “miracle.” Restructuring of finance, labour, and product markets has failed to recreate the preconditions necessary for renewed long-term egalitarian growth. Therefore, liberalisation should be rejected in favour of a “democratised and modernized state-led growth model (p. 328)”.

Bascom (1994) argues that high and volatile interest rates associated with financial reform can have liquidity and solvency effects on companies accustomed to financing their operations and capital formation with bank credit. The implementation of financial reform policies becomes more difficult when the banking system is in a situation of financial crisis. The deregulation of interest rates and the removal of entry restrictions on new banks, which are desirable under normal circumstances, may not be appropriate when the banking system is in the throes of financial distress. As a result of the financial liberalisation policies, promoters of new financial institutions may be motivated by the need to access easy financing for their own businesses. This can create further credit concentration in the banking system and aggravate the crisis (p. 174).

McLeod (1998) argues that the world has entered a new era of financial fragility. This new era has been ushered in by a huge and growing pool of highly mobile financial capital – including funds mobilised by rapidly expanding banking and financial systems in many developing countries – and by the global trend to openness in regard to capital flows (pp. 348-49).

Jackson (1999) names capital account convertibility, fixed exchange rates, excessive expansion of domestic lending accompanied by gross misallocation of investments by the private sector, and absence of regulatory and supervisory capacities to control excesses in the financial sector as the major factors responsible for the East Asian financial crisis of 1997. Excessive borrowing abroad, primarily by the private sector, is the hallmark of this crisis. In the five years prior to the crisis, the borrowings of banks and non-banks in the affected countries grew very rapidly. In particular, banks in each country rapidly increased their net foreign liabilities by large percentages during the four years prior to the crisis. By the time the crisis broke in mid-July 1997, total external indebtedness had reached large proportions, exceeding 50 percent of GDP in Thailand, Indonesia, and the Philippines (p. 3).

Although external aspects (fixed exchange rates, high interest rates, and excessive borrowing from abroad) are among the important causal factors in this crisis, the crisis would not have occurred without internal weaknesses as well: inadequate supervisory institutions, traditional banking practices, and, most of all, poor investment decisions made by the private sector of each country (Jackson 1999, p. 5).

Wade (2001) argues that liberalizing the financial sector and opening the capital account is dangerous when the banks have little experience in international financial

markets, and when non-banks also borrow abroad. It is doubly dangerous in the context of a bank-based financial system and a high debt-to-equity corporate sector. It is triply dangerous when the exchange rate is pegged. When, in addition, the banks and non-banks are essentially unsupervised, a banking-cum-currency crisis is just waiting to happen (p. 67).

Financial liberalisation is regarded as the source of financial crisis. However, it is critical to the efficient functioning of financial markets so that the markets can channel funds to those with the most productive investment opportunities. Getting funds to those with the most productive investment opportunities is especially important to emerging market countries because these investments can have especially high returns, thereby stimulating rapid economic growth. Therefore, the dangers associated with financial liberalisation do not mean that countries should not pursue a liberalisation strategy. However, some strong measures should be implemented to prevent the financial system from crises. These include sustainable macroeconomic policies and competent macroeconomic management, sound prudential regulations and strong supervisory framework.

2.7 Summary and Concluding Remarks

In this chapter, we have reviewed literature on financial liberalisation and its impact on the economy. We have found that economists differ in their viewpoints regarding the role of finance in economic growth. Three different views are found in the literature concerning the potential role of finance on economic growth. The first view considers finance as a critical element of growth. The second view regards finance as a relatively unimportant factor in growth. And, the third view claims that the financial development may potentially have negative impact on growth.

A series of studies have been devoted to analyse the direction of causality between financial development and economic growth. Most contemporary studies suggest that the direction of causality runs from the financial to real development. These studies have shown that increased savings, efficient investment, active stock market activities, quality bank services, transaction ease, and suitable financial structure are the possible channels through which financial development can influence economic growth. Similarly, some studies have also claimed that there exists a bi-directional relationship between financial development and economic growth. Contrary to these assertions,

some studies do not find any significant causal relationship between financial development and economic growth.

Despite the widely recognized importance of financial development, many governments in the past have repressed their financial systems mainly in order to collect easy money for financing their budget deficits, to have control over the monetary instruments to enable them for effective regulation, and to direct the capital toward the favoured sectors. But such policies of financial repression in practice have been proved to be harmful to economic growth. The widely felt damaging effects of financial repression policies on economic growth have given impetus to financial liberalisation.

The main objective of financial liberalisation is to increase the supply and improve the allocation of funds for investment. Under the liberalisation process, the barriers to entry in the banking sector are removed and the securities market is developed. Entry of the new banks into the market helps widen the financial system, increasing the banks to population ratio. Similarly, development of the securities market increases supply of the capital for longer-term investments and helps maintain the liquidity in the market.

Financial liberalisation has been equated to a shift towards higher real interest rates, which can increase loanable funds by attracting more household savings to bank deposits. However, empirical findings do not support this assumption. Most of the empirical studies have reported the interest rate effects on savings to be either inconclusive or negative.

Under the financial liberalisation process, the relaxation of reserve requirements, abolition of credit ceilings, and scaling down of the directed credit programs leads to an increase in the volume of loans to private entrepreneurs from the banking sector. However, neo-structuralists do not agree with this view.

Many developing countries have opened up their external accounts in the course of their financial reforms in order to gain the access to international financial markets. Flow of foreign capital facilitates specialization in the production of financial services, introduces competition from abroad, and stimulates innovation. However, it may also lead to bouts of over-borrowing.

The speed and the sequencing of financial liberalisation process is important in order to reap the fruits of liberalisation, but varies across countries depending upon their initial economic conditions. The optimal order of liberalisation advocated by McKinnon

consists of balancing government's finances in the first phase, opening of the domestic market in the second phase and liberalisation of the external account in the last phase.

The supporters of financial liberalisation advocate that the policy enhances welfare and equalises the distribution of income. Some economists, on the other hand, claim that the effects of financial liberalisation on welfare are ambiguous. Similarly, much of the evidence from both developing and developed economies points to significant destabilizing consequences of financial liberalisation, including incidents of severe financial crises. The implementation of financial liberalisation programs, especially in developing countries with weak institutions, may create new problems.

It can be seen from the survey of the literature that a series of studies have examined various aspects of the financial liberalisation in parts but the literature lacks a comprehensive study on the overall impact of the policy. Most of the empirical studies concentrate on analysing the growth aspects of the financial liberalisation and very few examine the impact of the policy on financial stability. However, no such studies can be found in the literature presenting empirical evidence on effects of the policy on redistribution of income, although some studies have included theoretical discussions on this aspect. This type of gap in the literature has motivated this study to conduct a comprehensive empirical investigation on the overall impact of the financial liberalisation policy.

Chapter 3

LIBERALISATION PROCESS IN NEPAL

This chapter presents the economic scenario of the country and discusses the key aspects of the financial liberalisation process in Nepal. In section 1, an overview of the Nepalese economy is presented. The picture of the Nepalese financial system before liberalisation is portrayed in section 2. Finally, various policy measures implemented under the financial liberalisation process are discussed in section 3.

3.1 An Overview of the Nepalese Economy

Nepal is a land-locked South Asian country sandwiched between two giant countries - India and China. The total area covered by the country is 147181 square kilometres, the total population is 23.2 million¹ and the average rate of population growth is 2.2 per cent. About 86 per cent of the population resides in rural areas.

Nepal was divided into various small principalities before 1768 AD. King Prithvi Narayan Shah performed the unification of the Nepal kingdom by conquering these principalities. Till 1768, Nepal was limited to the present Kathmandu valley, which had 3 different principalities in it. Since the unification, the kingdom has remained as a sovereign country, successfully escaping from the British occupation as well as from the colonization of other countries.

Nepal was freed in 1951 from the century long Rana family rule². After the political change of 1951, Matrika Prasad Koirala became the first prime minister from the general public. From 1952 to 1959, the country initiated various reforms, institution building, and development works under three different prime ministers. The first five-year development plan started in 1956. A multiparty political system was introduced in 1959 that had a short life of about 2 years. From 1961 to 1991, one party political system prevailed in the kingdom. After the popular movement of 1991, the country

¹ Population Census 2001, Central Bureau of Statistics, His Majesty's Government of Nepal.

² During the Rana rule, the King remained as a ceremonial figure and the Prime Minister ruled the country. The prime ministerial post was received by birth, as only the son or the brother of the Rana prime minister could become the next prime minister.

again adopted a multiparty political system. But due to the weaknesses in exercising the multiparty system as well as due to the inability of the governments to uplift the economic status of the general public, the country has been going through a serious political crisis. In this backdrop, Maoist rebels³ have been waging guerrilla war against the government and the monarchy since 1996.

After the royal palace massacre⁴, Prince Gyanendra, brother of the then King Birendra, became the new king in June 2001. In October 2002, King Gyanendra dissolved the elected House of Representatives and nominated a cabinet to run the country's administration. One after another, three different governments were nominated by the king, but all of them failed to work in accordance to the king's wishes. As a consequence, King Gyanendra finally assumed the power by himself in February 2005, and has formed the cabinet under his own chairmanship. Since this event, the country has gone under the direct rule of the king.

Nepal is one of the least developed countries in the world with a per capita income of USD 240 per annum. About 38 per cent of the population live below the poverty line, and the majority of the rural population come under this category. Only 53.7 per cent of the population is literate and the average life expectancy is 59.7 years.

Low economic growth and unequal income distribution has been the main features of Nepalese economy. Planned development efforts initiated from 1956 have not been able to raise the economic status of the people to a satisfactory level. A variety of geo-political and structural constraints, such as land-lockedness, rugged terrain, limited resources, low income, low savings, higher rate of population growth, limited transportation facilities, limited infrastructures, and an unstable political system have hindered the economic development of the country.

3.1.1 Structure of GDP

The agriculture sector, which also encompasses fisheries and forestry, is the backbone of the Nepalese economy. In fiscal year (FY)⁵ 2003, the contribution of this sector to GDP was 39 per cent, whereas the contribution of all other non-agriculture sectors accounted for 61 per cent (Figure 3.1).

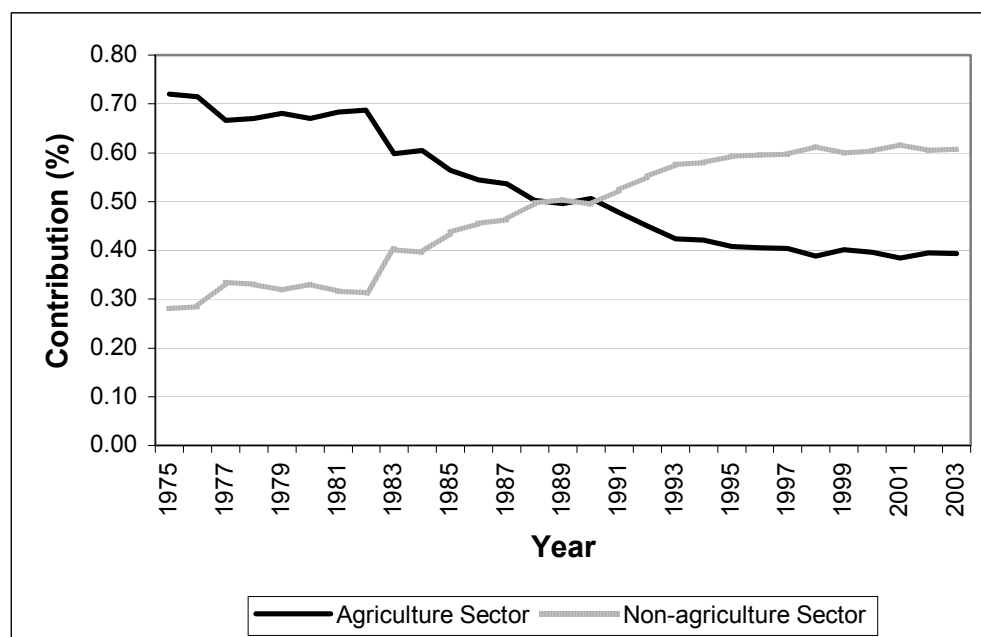
³ Nepal Communist Party (Maoist).

⁴ King Birendra, Queen Aiswarya and other members of the royal family were shot dead on 1 June 2001. Crown Prince Deependra, who later killed himself, is said to be responsible for these killings.

⁵ Nepalese fiscal year begins on 16 July and ends on 15 July of the next year.

About 80 per cent of the country's population is engaged in the agriculture sector. But, the contribution of this sector to GDP is gradually declining. The contribution of this sector to GDP was 72 per cent in FY 1976. During the last 28 years, the annual average share of agriculture sector in GDP has remained at 52 per cent.

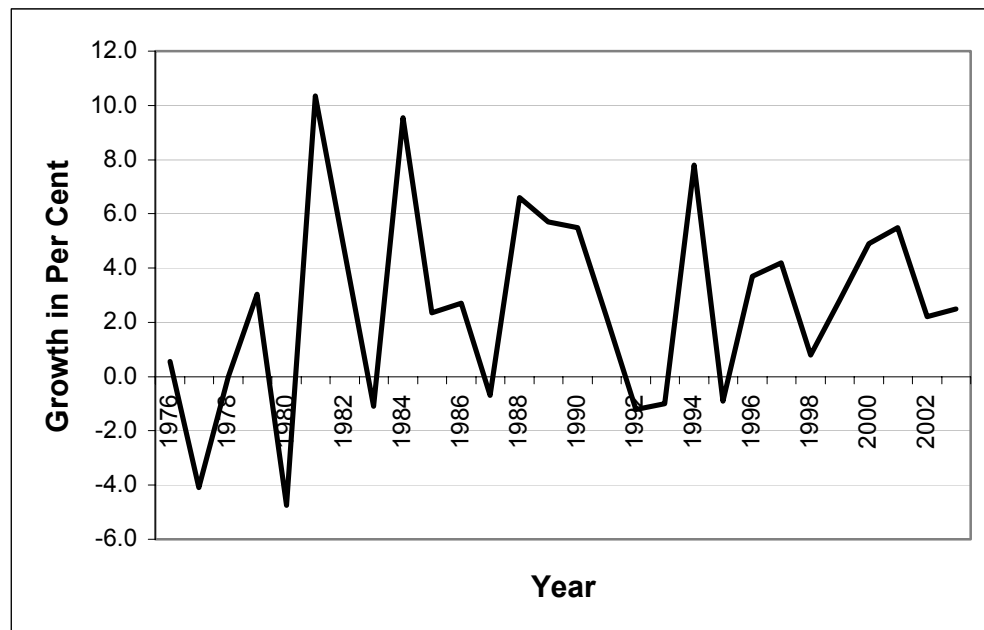
Figure 3.1 **Structure of GDP**



Source: *Economic Survey, various issues, His Majesty's Government of Nepal, Ministry of Finance.*

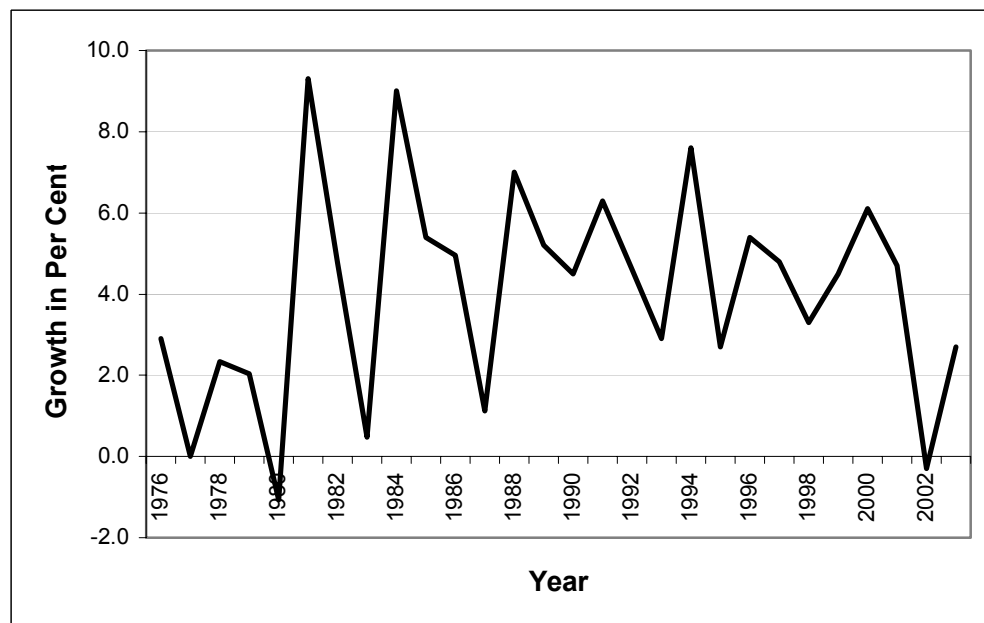
Despite being the backbone of the economy, Nepalese agriculture sector is still undeveloped. Use of traditional farming method, lack of irrigation facilities, lack of agricultural inputs and others has compelled this sector to depend upon the vagaries of nature. As a result, weather conditions hugely determine the level of agricultural output. Due to the unfavourable weather conditions in FY 1977, 1980, 1983, 1987, 1992, 1993 and 1995, the agricultural sector recorded a real negative growth (Figure 3.2), which caused the GDP growth to remain at low level during these years. In FY 2003, this sector is estimated to have achieved a growth rate of 2.5 per cent. The annual average growth rate of agriculture sector during the last 28 years has remained at 2.6 per cent.

Figure 3.2 Real Growth Rate of Agricultural Sector



Source: Economic Survey (various issues), His Majesty's Government of Nepal, Ministry of Finance.

Figure 3.3 Real Growth Rate of Non-agricultural Sector



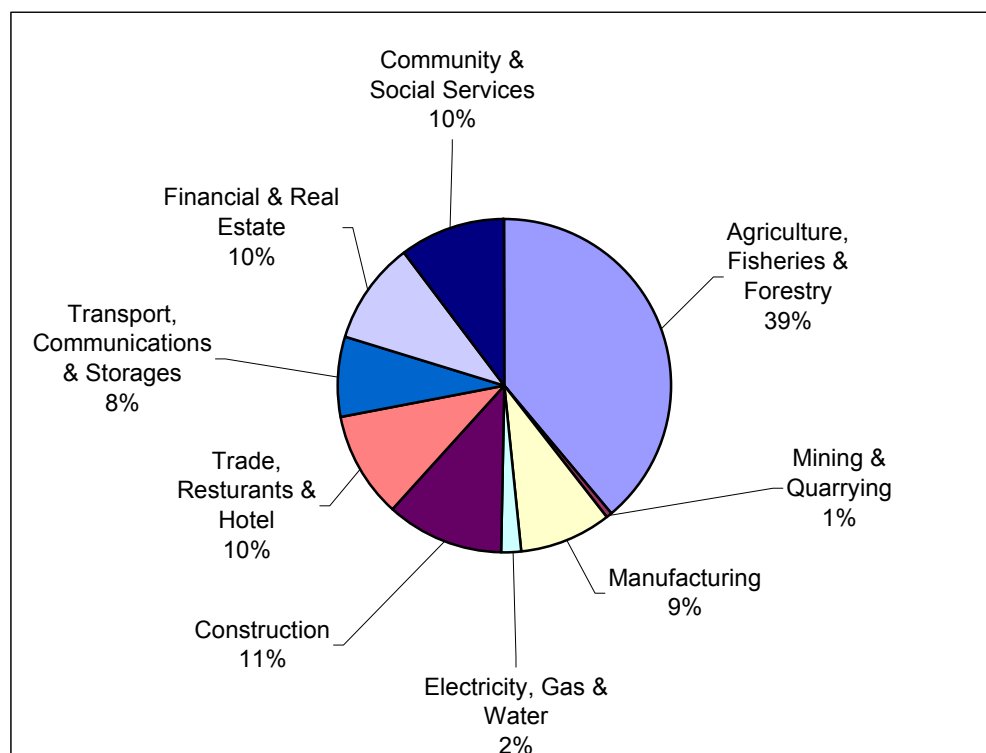
Source: Economic Survey (various issues), His Majesty's Government of Nepal, Ministry of Finance.

The contribution of the non-agricultural sector to GDP is increasing. The share of the non-agricultural sector in GDP increased to 61 per cent in FY 2003 from 28 per cent in FY 1976 (Figure 3.1). Despite the increasing share in the GDP, the growth rate

of the non-agricultural sector is declining (Figure 3.3). The growth rate of this sector reached 11.0 per cent in FY 1985, which came down to 4.3 per cent in FY 2001 and became negative in FY 2002. However, this sector is estimated to have grown by 2.9 per cent in FY 2003. During the period of 1976-2003, the average annual growth of this sector has remained at 6.0 per cent.

The declining growth of the non-agricultural sector can be attributed to industrial insecurity, political instability, a low level of development activities, inadequate infrastructure, weak business confidence, low level of private investment, and high cost of funds. Among the non-agriculture sectors, the construction sector contributed 11 per cent, the community and social services sector contributed 10 per cent, and the trade, restaurant and hotel sector also contributed 10 per cent to GDP in the fiscal year 2003. Similarly, the contributions from manufacturing, and transport, communication and storage stood at 9 per cent and 8 per cent, respectively. Sectors making smallest contribution to GDP are electricity, gas and water, and mining and quarrying. Contribution of these sectors to GDP accounted for 2 per cent and 1 per cent, respectively (Figure 3.4).

Figure 3.4 Sectoral Contributions to GDP

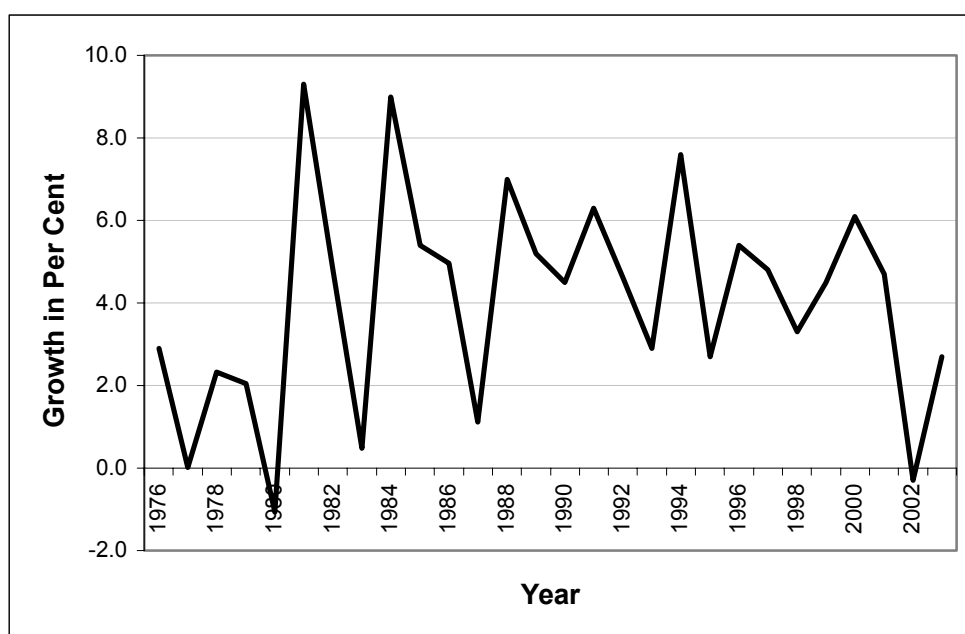


Source: Economic Survey 2003, His Majesty's Government of Nepal, Ministry of Finance.

3.1.2 Growth of GDP

The growth of the real GDP has been highly uneven during the last 28 years (Figure 3.5). It grew by 4.0 per cent on an average during 1976-2003. During this period, the real GDP growth rate was recorded at a high level of 9.3 per cent in FY 1981, and the negative growth rates were recorded in 1980 and 2002. The negative real GDP recorded in 1980 was mainly due to the negative growth in the agriculture sector, whereas that was due to the negative growth in the non-agricultural sector in 2002. In FY 2003, the real GDP is estimated to have grown by 2.7 per cent.

Figure 3.5 Growth Rate of Real GDP

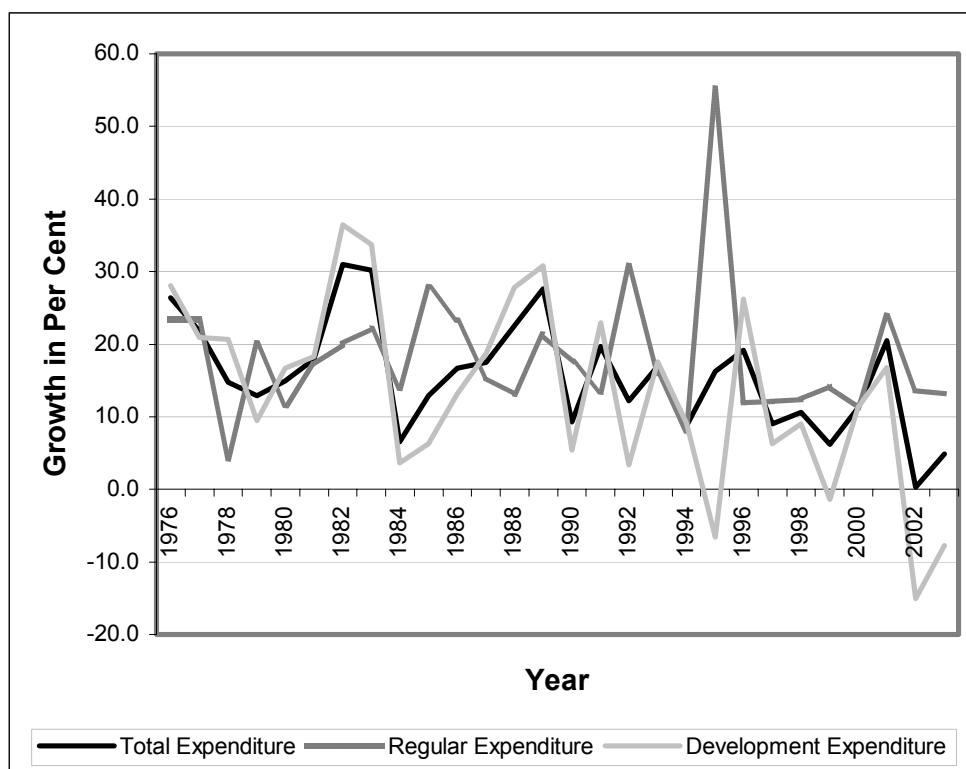


Source: *Economic Survey (various issues)*, His Majesty's Government of Nepal, Ministry of Finance.

3.1.3 Government Finance

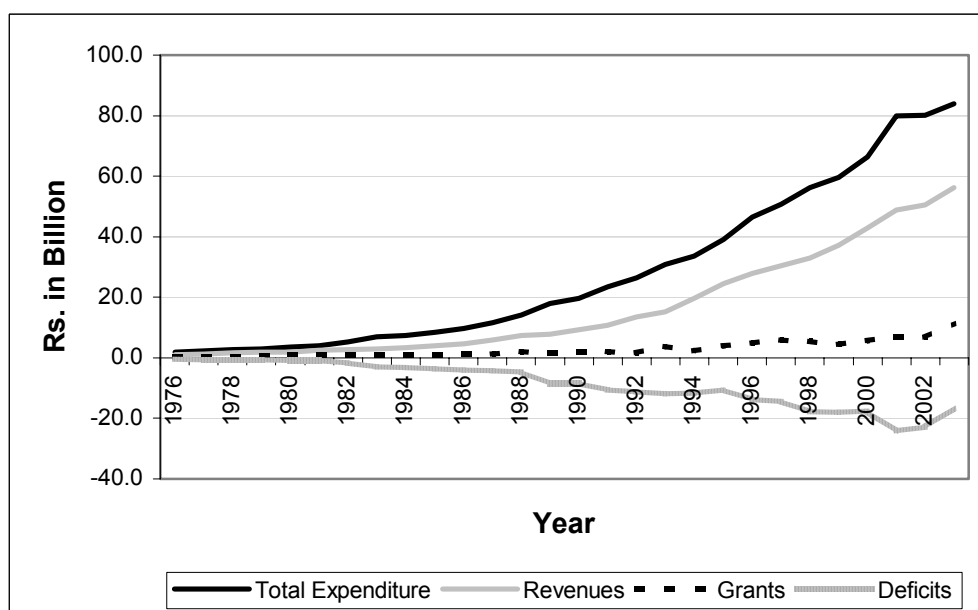
Total government expenditures have increased by an annual average of 15.7 per cent during the 1976-2003 period (Figure 3.6). Out of the total expenditure, the growth of regular expenditure exceeded the growth of development expenditure. The regular expenditure during this period recorded an annual average growth of 18.2 per cent, whereas development expenditure grew by an annual average of 13.6 per cent only. These figures clearly depict that much of the available resources were spent on maintaining law and order, and as a result, development activities received less resources.

Figure 3.6 Government Expenditure Pattern



Source: Economic Survey (various issues), His Majesty's Government of Nepal, Ministry of Finance.

Figure 3.7 Government Budget



Source: Economic Survey (various issues), His Majesty's Government of Nepal, Ministry of Finance.

Revenue is the most important source of financing government expenditures. But it has contributed only about 60 per cent of the total actual expenditures (Figure 3.7). In total revenue, tax revenue contributes more than 70 per cent and in the total tax revenue, the contribution of the direct taxes is less than 15 per cent. The portion of foreign grants also is very small. As a consequence, the government budget deficits are persistently increasing. On an average, the budget deficits remained at 32.5 per cent of the annual budget and 6.1 per cent of the GDP in the last 28 years. For this reason, the development activities have to be financed by external as well as internal borrowings. This phenomenon has been the limiting factor of development activities in the country.

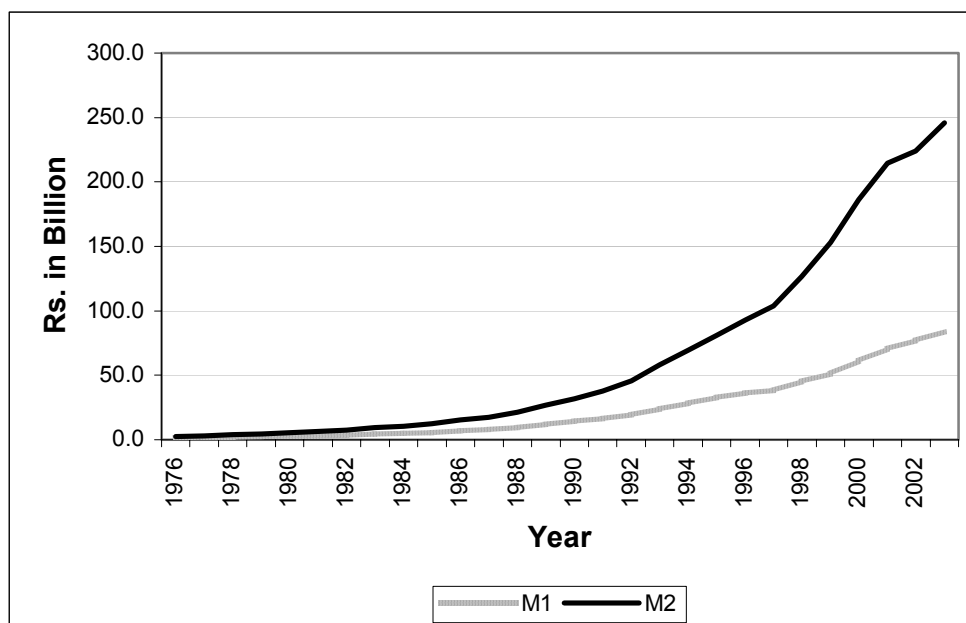
3.1.4 Monetary Expansion

The primary objectives of monetary policy in Nepal are to keep inflation rates low, facilitate economic growth and secure a reasonable level of surplus in the balance of payments. In order to achieve these objectives, the monetary aggregates-based monetary policy strategy framework has been put in place.

The ever-increasing budgetary deficit of the government has put increasing pressure on monetary expansion. As a result, the money supply is showing an increasing trend. Against this backdrop, the central bank has adopted a monetary policy stance which is directed basically at maintaining domestic price stability and securing a reasonable level of balance of payments on the one hand and providing an adequate level of liquidity to stimulate the economic activities in the economy on the other. The monetary policy stance also aims at softening interest rates for stimulating economic activities.

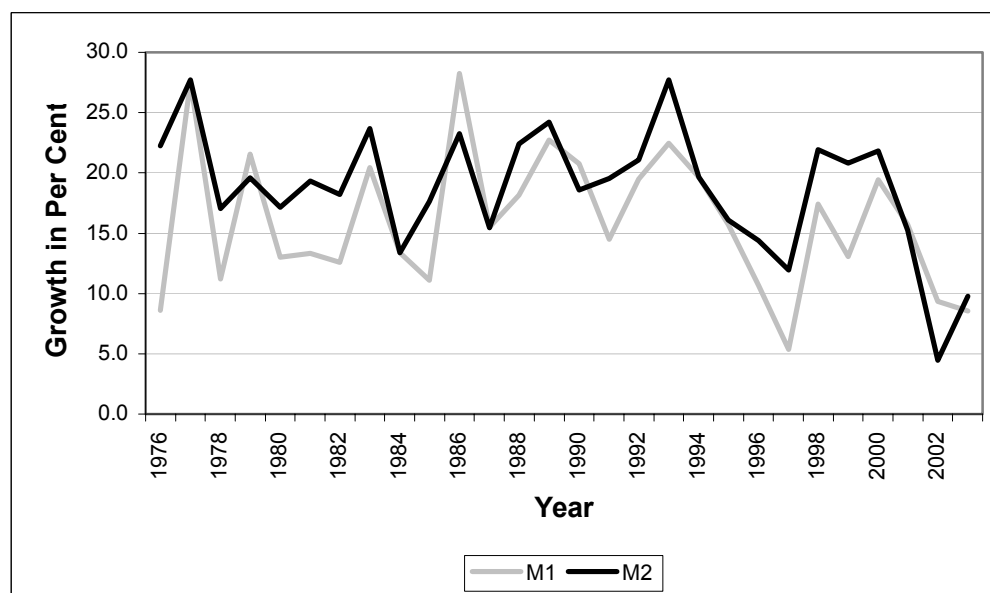
The narrow money (M1) increased by 8.6 per cent in FY 2003 from the previous year and reached to Rs.83.8 billion, whereas broad money (M2) increased by 9.8 per cent in this period and reached Rs.245.9 billion (Figure 3.8 and 3.9). The growth rate of M2 has been higher than that of M1. The average annual growth rate of M1 stood at 16.1 per cent during 1976-2003, while that of M2 stood at 18.7 per cent during the same period.

Figure 3.8 Monetary Expansion



Source: Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank.

Figure 3.9 Monetary Growth



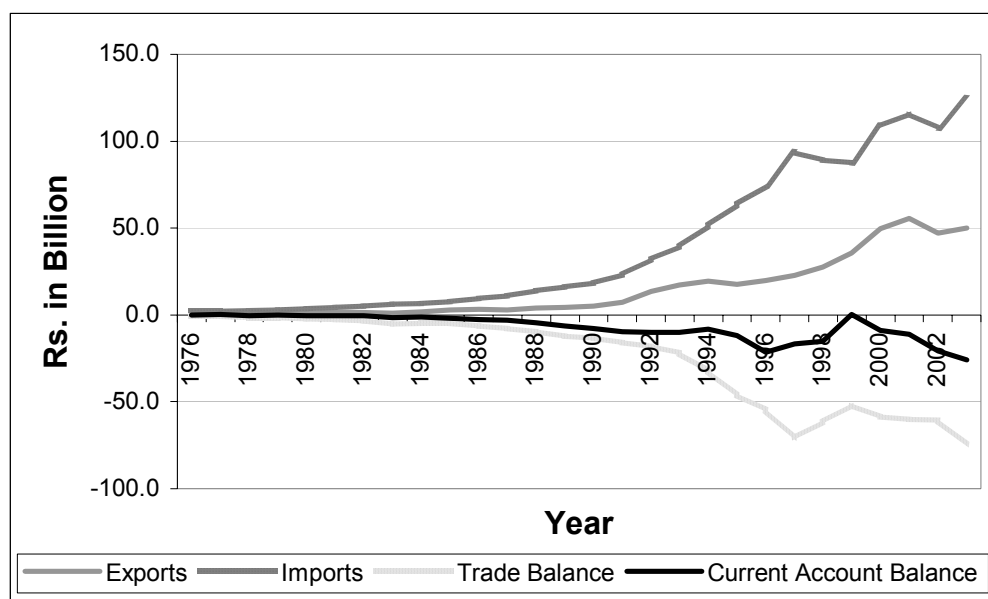
Source: Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank

3.1.5 Balance of Payments

In the external trade front, both the exports and imports show an increasing trend, while the growth rate of imports is higher than that of exports resulting in a

increased negative trade balance. Total exports in 2003 registered a growth of 6.4 per cent compared to the previous year, while the total imports in the same period grew by 15.8 per cent. In the payments front, the current account balance recently has registered a rapid negative growth mainly due to the increasing negative trade balance. The current account deficit in 2002 was Rs.20.8 billions, which increased in 2003 by 25 per cent and reached Rs.26.0 billions.

Figure 3.10 **Balance of Payments**

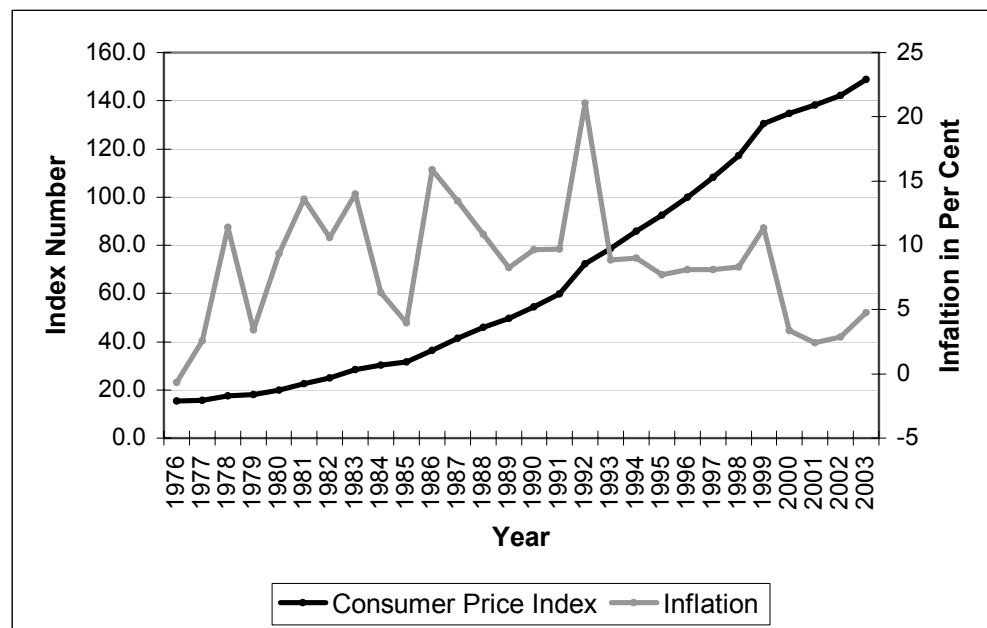


Source: *Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank*

3.1.6 Inflation

The annual rate of inflation has remained below 10 per cent during most of the period after 1993, except in 1999. In FY 1999, the rate of inflation reached 11 per cent. The consumer price index (1995=100) in 2003 stood at 148.9. The annual average rate of inflation during the 1976-2003 years remained at 8.5 per cent.

Figure 3.11 Inflation



Despite several planned efforts, the economic status of the country has not improved to a satisfactory level. Incidence of poverty is still high. As a consequence, Nepal has remained as one of the poorest countries in the world. As mentioned earlier, the country currently is suffering from a serious socio-economic and political crises due mainly to its economically-backward state.

3.2 Nepalese Financial System Before Liberalisation

Until the mid 1980s, the Nepalese financial sector comprised of two commercial banks, two Development banks, two insurance companies, and three other institutions, namely the Security Exchange Centre, the Employees Provident Fund and the Credit Guarantee Corporation. Most of these institutions were state owned.

The establishment of Nepal Bank Limited (NBL) in 1937 was the first step toward establishing an organised financial system in Nepal. Prior to that, the Nepalese financial system was unorganised and comprised of informal financial institutions like landlords, moneylender and shopkeepers.

At that time, Indian currency was widely in circulation in Nepal. The Nepalese economy was predominantly non-monetised and highly influenced by the Indian market. With a view to facilitate the use of Nepalese currency and help banking development in the country, the Nepal Rastra Bank (NRB) - the central bank of the country, was established in 1956 under the Nepal Rastra Bank Act 1955. During the

initial phase, the main focus of the Nepal Rastra Bank was on replacing the circulation of Indian currency by Nepalese currency.

In 1959, Nepal Industrial Development Corporation (NIDC) was established to meet the long-term and short-term credit needs of the industrial sector. The corporation provides financial and technical assistance for setting up, expansion and modernization of the industries. In 1963, the Co-operative Bank was established to provide institutional credit to co-operative members. This bank did not extend credit to the non-member farmers. In 1964, the Land Reform Savings Corporation was established with the implementation of a land reform program in the country.

In order to meet large agricultural credit requirements, the Agricultural Development Bank of Nepal (ADBN) was established in 1968, and the Co-operative Bank and the Land Reform Savings Corporation merged with it. An increasing need for banking services was felt along with increased economic activities in the country. To fulfil such needs, Rastriya Banijya Bank (RBB), the second commercial bank of the country was established in 1966 with 100 per cent government ownership. Similarly, Credit Guarantee Corporation was established in 1974 and Securities Marketing Centre was established in 1976.

Like in other developing countries, an administered interest rate was a striking feature of the financial sector in Nepal. NRB made frequent changes in the interest structure. Therefore, it was the state, not the market that determined the interest rate.

NRB used to issue treasury bills (TBs) on behalf of the government without any bidding from the participants. TBs used to be issued with an exogenously determined coupon rate. Such an interest rate fixed for the TBs almost always remained below the market interest rate. This was a deliberate attempt to make funds available to the government at the cheapest possible rate. Consequently, market participation was rather low. In fact, the commercial banks did not buy TBs enthusiastically.

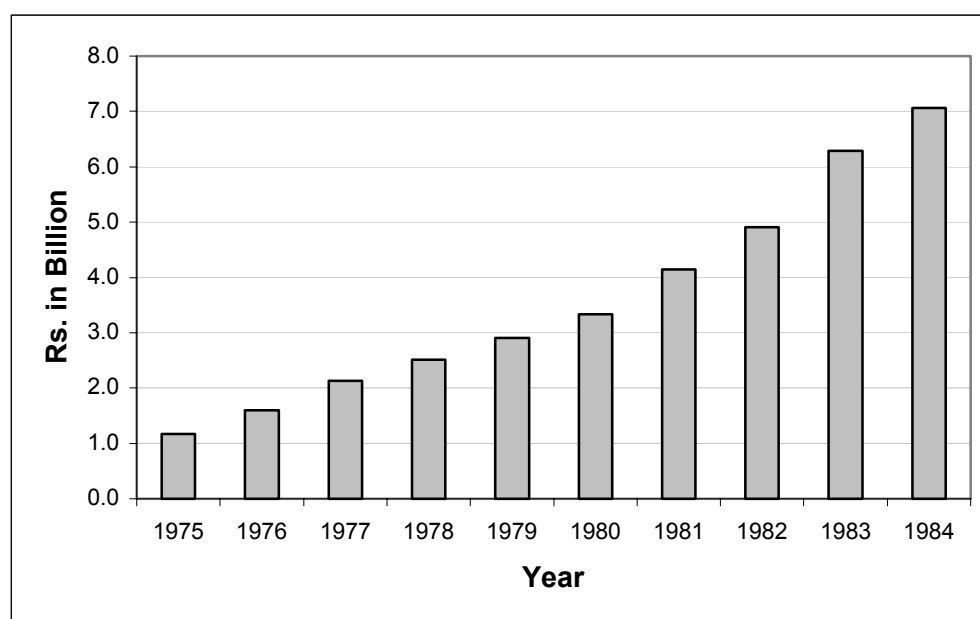
NRB adopted direct monetary policy stance. Under this policy, the behaviour of the market was directly controlled in terms of both volume and the price of loans. The Bank introduced a cash reserve ratio (CRR) in 1966 and statutory liquidity ratio (SLR) in 1974. SLR in the form of holding government securities was primarily intended at securing commercial banks' resources for government use. In other words, this instrument was used to deny credit to the private sector. This also interfered in the portfolio choice of commercial banks.

The Securities Marketing Centre was established in 1977 with a view to develop secondary market for the government papers. To make the government papers popular and thereby help finance government deficit, an institutional set up of secondary transactions for these papers was needed. In this regard, the Centre was established to provide liquidity to the government papers.

3.2.1 Deposit Mobilization by Commercial Banks

NBL was the first bank to extend the modern banking services in the country. In the absence of a central bank, this bank assumed also the role of central bank until the establishment of NRB in 1956. After the establishment of RBB in 1966, two commercial banks gradually extended their activities in various parts of the country. Total deposits mobilized by these commercial banks increased by an annual average of 22.4 per cent during the last decade before liberalisation, which spanned from 1975 to 1984.

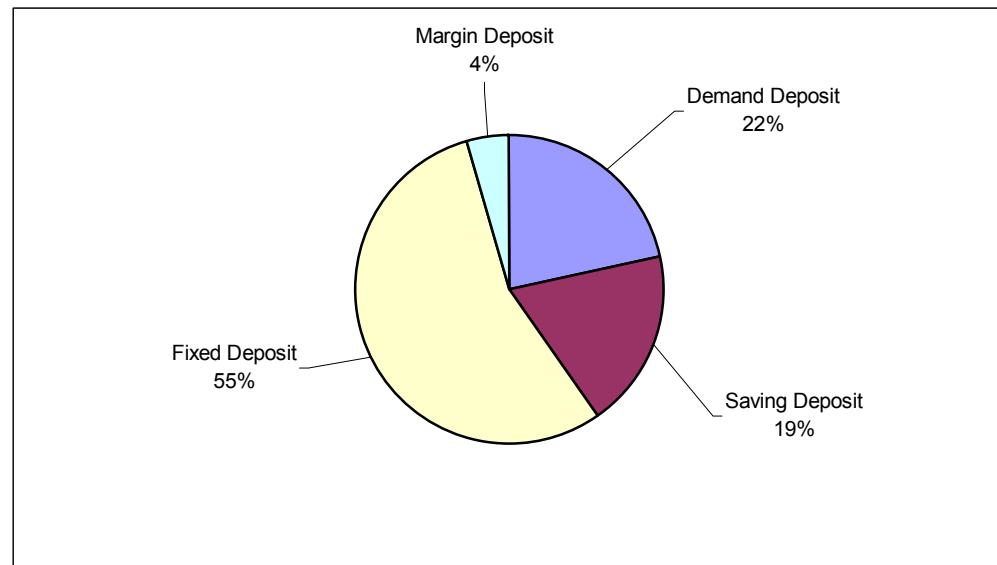
Figure 3.12 **Total Deposits at Banks**



Source: *Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank*

The total deposit collected by the commercial banks is composed of demand deposit, saving deposit, fixed deposit and margin deposit. In the total deposit, the fixed deposit had the largest share whereas margin deposit had the smallest share. In 1984, the share of demand, saving, fixed and margin deposits stood at 22 per cent, 19 per cent, 55 per cent and 4 per cent, respectively.

Figure 3.13 Composition of Deposits
(FY 1984)

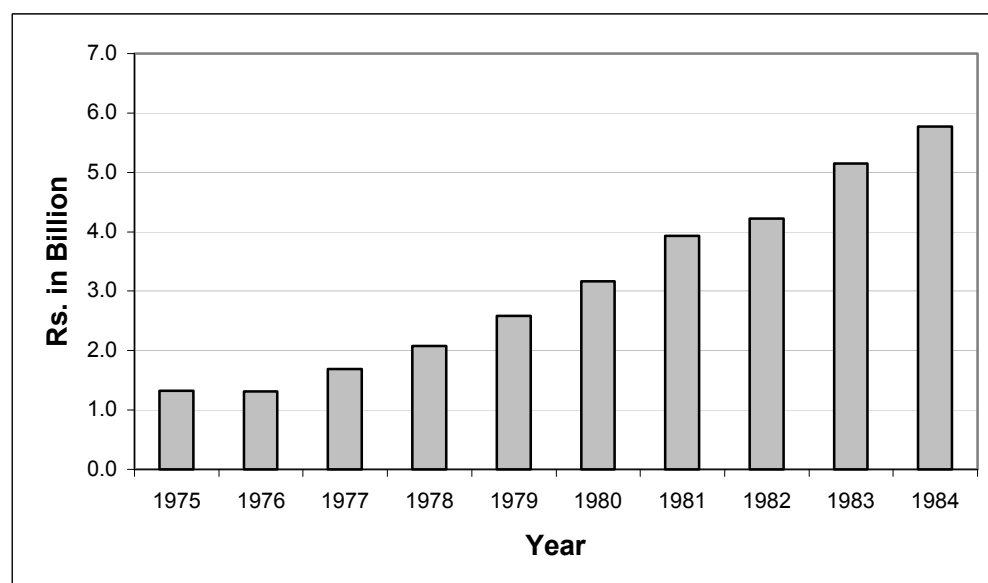


Source: Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank

3.2.2 Loan Disbursement by Commercial Banks

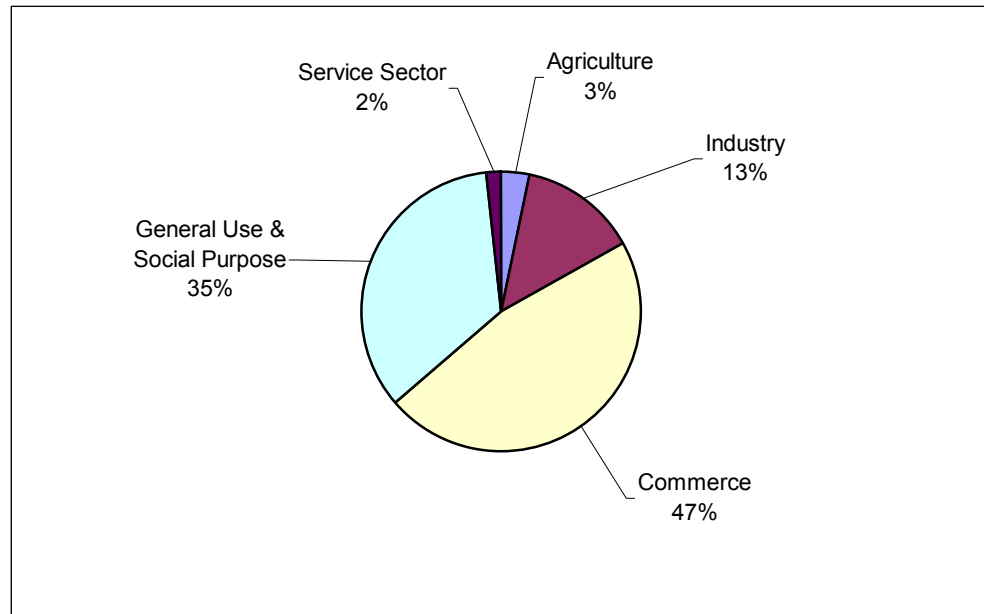
The total credit extended by the commercial banks increased from Rs.1.3 billion in 1975 to Rs.5.8 billion in 1984. The average annual growth rate of the total credit stood at 18.7 per cent during this period.

Figure 3.14 Total Loan Disbursement



Source: Economic Survey 1995, His Majesty's Government of Nepal, Ministry of Finance.

Figure 3.15 Composition of Loan by Purpose
(FY 1984)



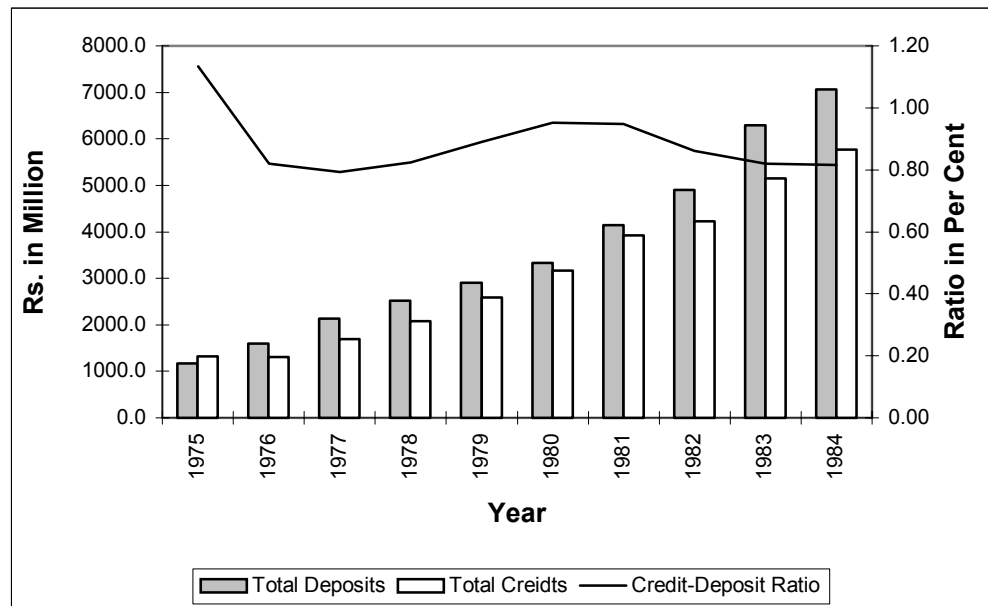
Source: Economic Survey 1995, His Majesty's Government of Nepal, Ministry of Finance.

A purpose-wise breakdown of credit (Figure 3.14) shows that the commerce sector occupied the largest share in the total credit and the share of general use and social purpose credit came in second place in the year 1984. General use and social purpose loans are loans extended for general consumption and social activities, which can be viewed as unproductive expenses. Agriculture and service sector received the smallest share of the credit from the commercial banks in the same year.

3.2.3 Credit-Deposit Ratio of Commercial Banks

The credit-deposit ratio of commercial banks showed an increasing trend from the year 1977 to 1981. But it declined from 1982 and continued until the year 1984. In the year 1984, the credit-deposit ratio stood at 81.7 per cent. This shows that the credit mobilization activities of commercial banks remained sluggish during the second half of that decade.

Figure 3.16 Credit-Deposit Ratio



Source: Economic Survey 1995, His Majesty's Government of Nepal, Ministry of Finance.

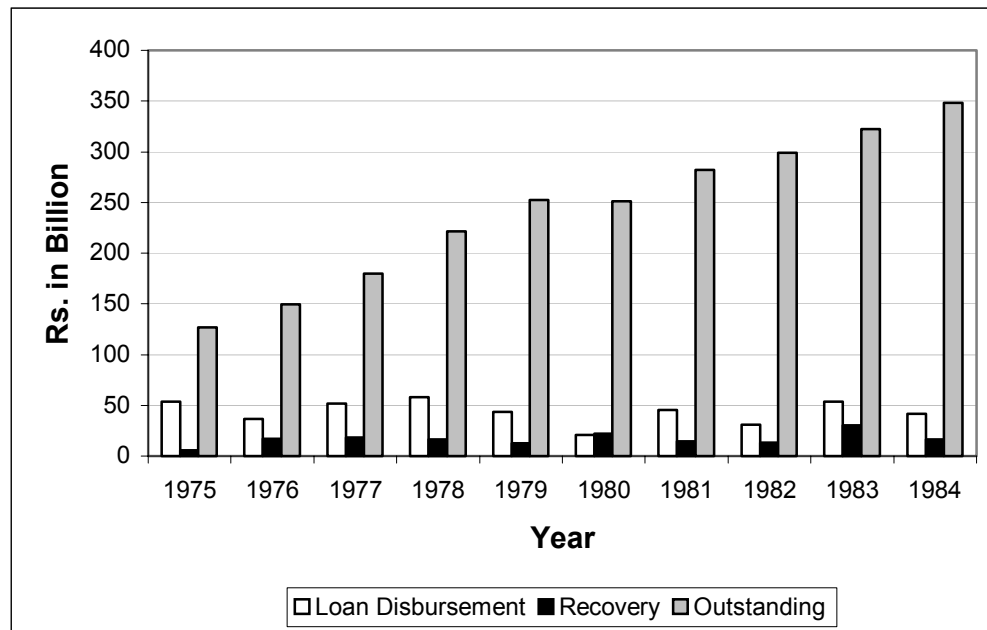
3.2.4 Branch Expansion of Commercial Banks

Both commercial banks expanded their branches gradually to spread their services nationwide. Under the Intensive Banking program, the government aimed at establishing one bank branch for every 30 thousand population. Under this program, commercial banks opened their new branches even in such locations where the bank branch was not commercially viable. In 1984, the total number of commercial bank branches reached 357, out of which 49 were in the Kathmandu valley and the rest spread over the cities and villages outside the valley.

3.2.5 Performance of Development Banks

Nepal Industrial Development Corporation (NIDC), the first development bank of the country, was established with the objective to help the development of the industrial sector through providing much needed financial resources. Before the establishment of this corporation, NRB directly provided the financial assistance to establish some industries. After its establishment, NIDC has been the main provider of industrial credit in the country.

Figure 3.17 Credit Operations of NIDC



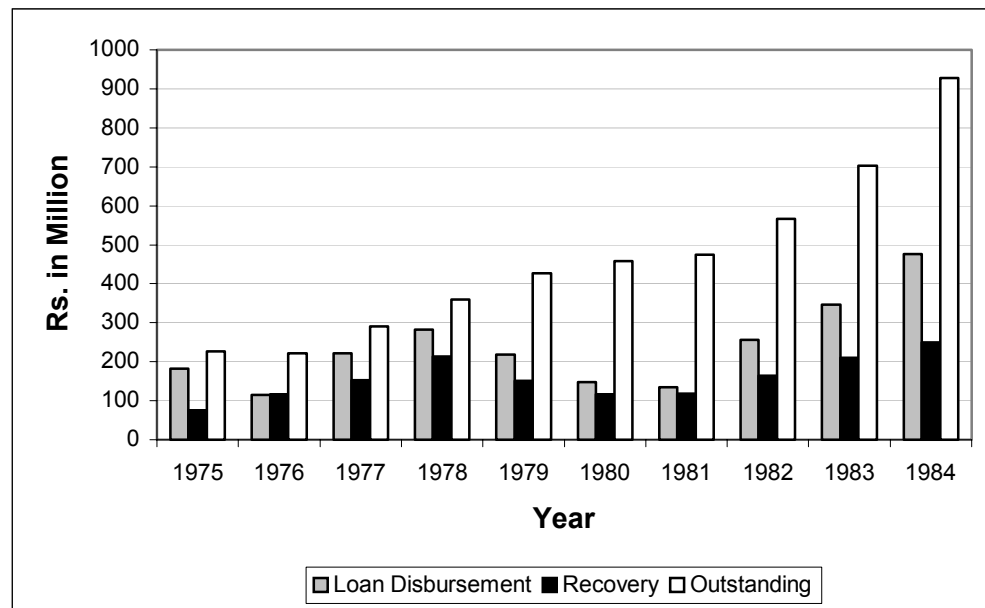
Source: Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank.

Loan disbursement of NIDC did not increase during the period between 1975-1984. Loan recovery also remained uneven and low. As a result, the outstanding loan of NIDC gradually increased during this period (Figure 3.16).

The Agricultural Development Bank of Nepal (ADBN), the second development bank of the country, was established with the objectives to mainly meet the credit needs of rural farmers and thus help in the development of the agricultural sector of the country. The then Co-operative Bank and Land Reform Savings Corporation were merged into this bank. This bank has been providing credit to rural farmers for agricultural farming, agro-based cottage industries, livestock and other small businesses.

The total loan disbursement of ADBN has been uneven during the 1975-1984 period. It had an increasing trend from 1975 to 1978, and then a decreasing trend from 1979 to 1981. However, from 1982 it recorded a gradual increase. The recovery also showed a similar trend, but the outstanding loan amount recorded a gradual increase throughout the period of 1975-84. ADBN started commercial banking activities in 1984 through its limited urban branches with a view to mobilize internal resources in order to meet its ever-increasing lending needs.

Figure 3.18 Credit Operations of ADBN



Source: *Quarterly Economic Bulletin, Mid-July 2004, Nepal Rastra Bank.*

The Nepalese financial system before liberalisation was quite small, regulated and inefficient. Due to the limited number of banks and other financial institutions, the country remained under served. There was no competition among banks and the quality of service provided by the banks remained much lower than desired.

Due to the lack of appropriate credit information systems, defaulters of one bank could get loans from another bank. Consequently, the portion of bad loans in the banks' total loans portfolio increased. Even the loan extended to the government enterprises against the government guarantee remained unpaid for quite a long time. As a result of this, the financial position of commercial banks continued to deteriorate.

Two commercial banks and two development banks were the major players in the Nepalese financial system. The chronic ailment of these banks led the financial system toward instability. This situation forced the country to adopt the policy of financial reform and liberalisation.

The following section discusses various policy measures employed under the financial liberalisation process in Nepal.

3.3 Financial Liberalisation Measures

The financial liberalisation process in Nepal started in 1984. Since then, various liberalisation measures have been implemented in order to widen and deepen the financial system. These measures are discussed below.

3.3.1 Removal of Entry Barriers (1984)

Financial liberalisation in Nepal started evidently with the removal of entry barriers in the banking system. Until 1984, only two government-owned commercial banks were operating in the market. With the objective of promoting healthy competition among banks, the Commercial Bank Act 1974 was amended in 1984, which removed the entry barriers to the private sector in the commercial banking industry. This was done mainly to attract private joint venture banks with foreign collaboration with the hope that such banks would bring in much needed foreign capital and technical know-how, infuse modern banking skills to the domestic banks, and, widen as well as deepen the national financial structure (Acharya *et al.* 1998, p.27). Following the amendment of the Act, joint venture banks started to enter the financial system. Nepal Arab Bank Limited, the first private bank, was established in 1984, as a joint venture with Arab Bank. The total number of commercial banks reached 17 and the total number of commercial bank branches reached 431 in July 2004 (Nepal Rastra Bank 2004).

In 1985, the Finance Companies Act was enacted in order to allow finance companies to enter the financial system. This was done with the objective of serving small borrowers and meeting the demand for consumer credit. But this Act could not produce the desired response in the market, as the Act was not clear and transparent (Acharya *et al.* 1998, p.27). Only one finance company was established under the government sector in 1989. To make the Act clear and transparent, the Finance Company Act 1985 was amended in 1992. Following this amendment, there has been a very fast growth in the establishment of finance companies. The number of finance companies in July 2004 reached 59 (Nepal Rastra Bank 2004).

3.3.2 Deregulation of Interest Rate (1984)

Interest rate deregulation started in November 1984 with partial freedom provided to the commercial banks to fix the interest rates from 1.0 percentage points to 1.5 percentage points above the minimum administered rates for different types of term deposits. In May 1986, this range was eliminated, allowing the banks to offer higher interest rates to any level above the fixed minimum level. In August 1989, the interest rate was completely deregulated. Since then, commercial banks and financial institutions are free to set both the deposits and loans rates. The objective of interest rate

deregulation was to let the market decide the true cost of capital, keep real deposit rates positive, thereby, stimulating savings and creating a competitive environment in the financial system so as to benefit both the depositors and borrowers (Khatiwada 1999, p.17).

3.3.3 Reforms in Treasury Bill Issuance (1988)

Treasury bills carried a coupon rate, which used to be generally low. Commercial banks were not interested in investing in such low yielding bills. As a result, Nepal Rastra Bank used to hold a large chunk of treasury bills, exacerbating the excess liquidity in the economy (Khatiwada 1999, p. 20). To rectify this anomaly, NRB commenced auctioning of TBs since November 1988. Initially, the auctioning was done on a monthly basis. As the market matured, auctioning frequency was increased to every fortnight, and then to weekly from December 1991 (Acharya *et al.* 1998, p.31). After the introduction of auctioning, commercial banks began to hold increasing shares of such bills.

3.3.4 Introduction of Prudential Norms (1988)

With the objective of helping in the sustainable development of the financial sector through creating a healthy banking environment, a set of prudential norms was introduced in 1988. Such norms put in place by NRB included capital adequacy requirement, loan classification, loan loss provisioning, interest income recognition, single borrower limit, and account disclosure norms. Most of these norms were revised in 1991. The requirements, ratios, limits, types, and formats set in these norms have been changed from time to time.

The Capital Adequacy Ratio (CAR) initially was linked to the total deposits mobilized by the banks. In 1991, CAR was tied up with the total risk weighted assets and off-balance sheet transactions of the banks. It was done in order to follow the international practice. Starting from FY 2005, the commercial banks as well as development banks are required to maintain a minimum of 6 per cent core capital and the total capital funds should not be less than 12 per cent of their risk-weighted assets. (Nepal Rastra Bank 2005a; 2005b).

Commercial banks initially were directed to classify their loans into four categories namely pass, substandard, doubtful, and loss. After the re-categorization of loans in 1991, the banks were required to classify their loans into six categories based

on the overdue period. Since 2002, the loans are categorised again into four categories, viz, pass, substandard, doubtful, and loss.

Along with the introduction of loan classification norms, commercial and development banks were directed to set aside certain funds as loan loss provisioning. Since 2002, such provisioning is 1 per cent for pass, 25 per cent for substandard, 50 per cent for doubtful, and 100 per cent for bad category loans (Nepal Rastra Bank 2005a; 2005b).

With the objective of avoiding the over-concentration of the bank resources in the hands of a few people as well as lowering the risk elements, single borrower limit was introduced in 1989. Since FY 2003, the single borrower limit is 25 per cent of the capital base for fund based lending and 50 per cent for non-fund based lending. Such limits are the same for both the commercial and development banks (Nepal Rastra Bank 2005a; 2005b).

Before the introduction of the norms related to interest income recognition, the banks used to show accrued interests as their income. On the basis of profits based on such accounting, dividend and bonus used to be paid. As a consequence, the financial health of the banks started to deteriorate. To check this trend, a new prudential norm was introduced in 1989, which redefined the interest income on the actual basis instead of accrual basis. According to this norm, interest income is recognized only when it is received in cash.

Another norm introduced in 1989 was related to disclosure of the financial information of financial institutions. To maintain a common accounting year in line with the fiscal year of His Majesty's Government of Nepal, financial institutions were directed to adopt the fiscal year starting on the 1st of the Nepali calendar month Shrawan (16 July) and ending on the 31 of Ashadh (15 July). Similarly, NRB developed common formats for financial institutions to prepare their balance sheet, profit and loss account, and classification of loans, advances and reserves.

3.3.5 Establishment of Credit Information Bureau (1989)

With a view to check the possible fraud and irregularities in banking transactions, the Credit Information Bureau was established in 1989. Every commercial bank has to supply necessary credit information to the Bureau and the Bureau in turn supplies credit information to all other banks. On the basis of credit information received from the banks, the Bureau prepares a defaulters list and a black list. Prior to

the establishment of the Bureau, a defaulter of one bank could obtain a loan from another bank. With the help of the credit information supplied by the Bureau, it has become easier for the banks to avoid the risky lending.

3.3.6 Shift in Monetary Policy Stance (1989)

The way monetary policy is conducted has a direct impact on the financial sector. After the full liberalisation of the interest rate and elimination of credit ceilings, the monetary policy stance has been changed from direct to indirect. Under the indirect monetary policy stance, there is no direct control on the price or interest as well as on the volume of loans of commercial banks. Market behaviour is aligned through the use of indirect monetary policy instruments such as bank rate, cash reserve requirement, and open market operations.

3.3.7 Strengthening of Government Owned Commercial Banks (1991)

To evaluate the financial positions of the two state-owned commercial banks – RBB and NBL, a study was conducted with the financial support of the UNDP in 1989. The study recommended a series of corrective and preventive measures to improve their financial performance. To implement the recommendation of the study, the government provisioned a supplementary budget of Rs.3.45 billion in 1991. The fund was used for the recapitalisation of two banks and to repay the government guaranteed overdue loans (Acharya *et al.* 1998, p.31).

3.3.8 Reform in Capital Market (1992)

The Securities Marketing Centre was established in 1977 with the objective of developing markets for the government securities. The centre carried out both regulatory and operational functions. In 1984, it was converted into the Security Exchange Centre, but the functions carried by it remained almost the same. The reform in capital market started with the amendment in the Security Exchange Act in 1992. Operational and regulatory functions were separated in 1993. The Security Exchange Board was established to look after the regulatory functions and at the same time the Nepal Stock Exchange Centre was created to carry out the trading of the securities (Khatriwada 1999, p.21).

3.3.9 Reduction in the Reserve Requirement (1993)

The banks were required to meet the high reserve requirement in the form of the Cash Reserve Ratio (CRR) introduced in 1966 and Statutory Liquidity Ratio (SLR) introduced in 1974. CRR was imposed for monetary control and prudential norms, whereas SLR was imposed to provide a captive market for government securities. The SLR was completely abolished in August 1993. After the complete liberalisation of the interest rate in 1989, the CRR however, was revised upward from 9 per cent to 12 per cent of the domestic deposits. Since April 1998, the CRR has been gradually revised downward. As of November 2003, the average CRR to be maintained by the commercial banks is 7.75 per cent of their domestic deposits (Nepal Rastra Bank 2003a, p.vii).

3.3.10 Introduction of Floor Trading of Securities (1994)

In January 1994, floor trading of the stocks was introduced under the Nepal Stock Exchange Centre. Due to this new arrangement, trading in stocks started to boom, and the number of listed companies as well as the market capitalization increased gradually. The number of companies listed in the Centre stood at 114 in July 2004.

3.3.11 Enactment of Development Bank Act (1996)

Nepal Industrial Development Bank (NIDC), established in 1959, and the Agricultural Development Bank (ADBN) established in 1968 were the two developments banks operating in the market to meet the long-term credits. To allow new development banks in the market, the Development Bank Act was enacted in 1996. The number of development banks including NIDC and ADBN has reached 25 in July 2004 (Nepal Rastra Bank 2004). This includes five regional development banks that are carrying micro credit operations in rural villages.

3.3.12 Revision of Nepal Rastra Bank Act (2001)

The Nepal Rastra Bank Act 1955 was revised in 2001. This Act has made NRB an autonomous institution. As in other developing countries, central bank of Nepal – Nepal Rastra Bank previously had to work under government control. As a result, the bank could not implement monetary policies as well as financial sector policies independently. It is expected that the revised Act will serve the requirements of a

modern central bank as part of the government's overall financial sector development and modernization program (Pyakuryal 2002, p.7).

3.3.13 Restructuring of Rastriya Banijya Bank and Nepal Bank Limited (2002)

The financial health of RBB and NBL was reported to be gradually deteriorating for quite some time. A diagnostic study carried out by KPMG-Barents Group in 1998 reported that these two banks would need between Rs. 25 to 30 billion for recapitalisation. To improve the financial health of these two banks, the restructuring process started with the technical and financial assistance of the World Bank. In this process, NRB has handed over the management of NBL to the ICC Consulting Group of Bank of Scotland in July 2002. Another professional group - Deloitte Touche Tohmatsu was selected for managing Rastriya Banijya Bank. But since this Group breached the contract, Nepal Rastra Bank hired Mr. Bruce F. Henderson, an American bank Professional, as the Chief Executive Officer of RBB in December 2002. Under the new management, restructuring activities are being carried out in these banks (Nepal Rastra Bank 2003a, p.ix).

3.3.14 Enactment of Debt Recovery Act (2002)

RBB and NBL gradually accumulated a huge proportion of non-performing assets (NPA). Such assets of RBB stood at 52 per cent and in the case of NBL; it reached 62 per cent of the total loans in 2003 (Kantipur National Daily 2003). The increasing NPA in the banking sector was attributed to the lack of strong legal measures for the recovery of loans. To address this issue, the Debt Recovery Act was enacted in 2002. This Act is expected to reduce the increasing pressures of bad loans in banks and financial institutions.

3.4 Concluding Remarks

Until the mid 1980s, the Nepalese financial system was small and highly regulated. There were less than a dozen government-owned banks and financial institutions including two commercial banks. The central bank adopted a direct monetary policy stance and controlled the volume as well as the price of loans. There was no competition in the market and the banks were inefficient in their functioning. Due to the lack of prudential rules and vigilance agencies, defaulters of one bank got

loans from another. All these factors collectively caused the financial system to become weak day by day. This situation required for a drastic reform of the financial sector of the country.

Compelled by the above situation, Nepal started financial liberalisation process in 1984. Under this process, various policy instruments have been implemented. Some policy instruments were aimed at increasing the competition and efficiency in the financial market, which included removal of entry barriers to commercial banks, finance companies and development banks, and restructuring of two state-owned banks. In order to improve the efficiency of money and capital markets, measures such as auctioning of Treasury Bills (TBs) and floor trading of securities were introduced. The policy instruments such as interest rate deregulation, reduction in reserve requirement and changing the monetary policy stance from direct to indirect were implemented with a view to pursuing market-driven monetary policy. Similarly, introduction of prudential norms, establishment of Credit Information Bureau, revision of Nepal Rastra Bank Act, and enactment of Debt Recovery Act were aimed at ensuring the integrity of banks and maintenance of the stability of the financial system of Nepal. All of these policy instruments were expected to complement each other in achieving the overall objectives of competition and efficiency, smooth functioning of money and capital markets, and attainment of stability in the financial sector of Nepal.

The implementation of various financial liberalisation measures might have brought some changes in the financial sector and in the economic sphere of the country. But the nature and the extent of such changes are not known since no systematic study has been conducted so far to evaluate the impact of the policy. In this context, this study aims at examining the overall impact of the various financial liberalisation measures in Nepal.

Chapter 4

ECONOMETRIC METHODOLOGY

This chapter introduces the hypotheses, methods and models used in this study. It starts with an aggregated framework for impact evaluation developed in section 1. In section 2, different sets of hypotheses are presented in three broad groups, *viz* growth, distribution, and stability. Section 3 discusses about the construction of a financial liberalisation index. This index is a summary of all the financial liberalisation measures, and is used throughout this study as the main indicator of the degree of financial liberalisation. In section 4 through 11, econometric models are constructed specifying the relationship between various sets of variables in order to test the hypotheses presented in section 2. Section 12 discusses the nature and the sources of the data used in this study.

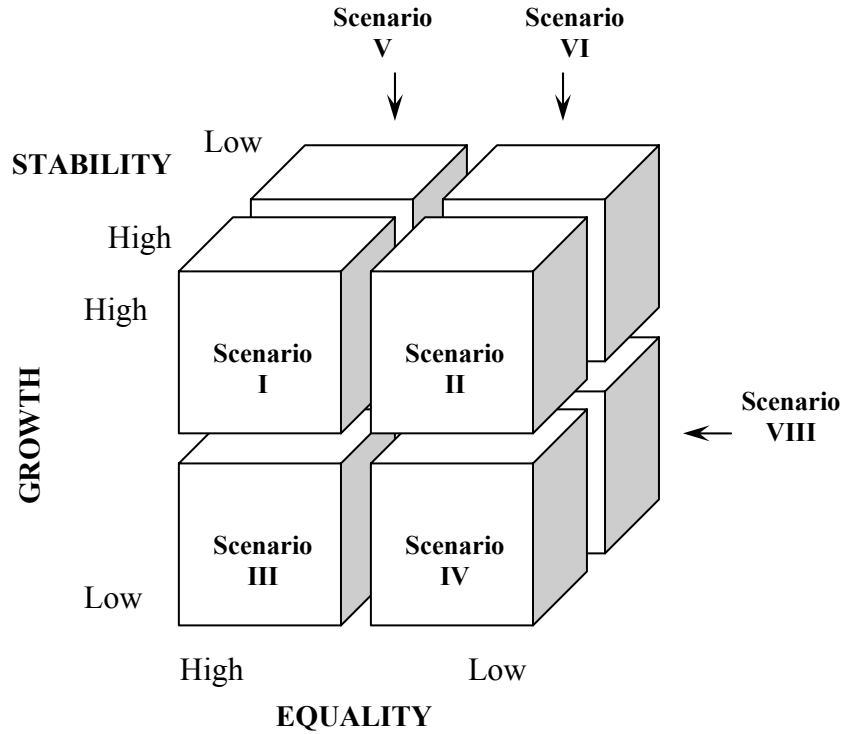
4.1 Aggregated Framework for Impact Evaluation

From the literature survey in Chapter 2, it is clear that most of the previous studies on financial liberalisation have focused on some particular aspect and generalised their findings as the overall impact of the policy. A few country-focussed studies have tried to analyse various aspects of financial liberalisation, but these have been done in fragmented parts and are incomplete. Hence, the literature lacks the single integrated framework to study the overall impact of the policy. In this regard, this study tries to bridge this gap by proposing an aggregated framework for studying the overall impact of financial liberalisation.

The common objective of any economic policy is to achieve social welfare, which comprises an optimal combination of growth, distribution and stability. The particular emphasis on these dimensions, however, may differ according to the society or the country, and according to the time. Financial liberalisation is also an economic policy. Therefore, the impact evaluation of the policy would be unambiguous and meaningful if done against the above three dimensions.

In this study, the following three-dimensional framework is employed in order to investigate the impact of financial liberalisation in Nepal.

Figure 4.1 **Three Dimensions of Financial Liberalisation**



The above framework is based on the BCG matrix¹. There are altogether eight possible scenarios and each scenario represents a different impact status. These scenarios are presented in Table 4.1 below.

Table 4.1 **Possible Scenarios**

<i>Scenario</i>	<i>Growth</i>	<i>Equality</i>	<i>Stability</i>
I	High	High	High
II	High	Low	High
III	Low	High	High
IV	Low	Low	High
V	High	High	Low
VI	High	Low	Low
VII	Low	High	Low
VIII	Low	Low	Low

Note: "Low" also encompasses the negative degree of impact

¹ A matrix developed by the Boston Consultancy Group in the 1970s. The original matrix is two-dimensional and depicts four different portfolio positions of a firm based on the growth and the market-share status.

In the above framework, scenario-I is the ideal case where all the dimensions, *viz.* growth, welfare and stability are high. On the other extreme, scenario-VIII is the worst possible case where all these dimensions are low. Scenario-III, V and VII represent the case of a financially repressed economy, where the emphasis is on welfare, or the redistribution of income. Scenario-V is better than scenario-III and VII, but the case of most of the developing countries resemble scenario-VII, where welfare is achieved to some degree but the economic growth, and the stability (specifically the financial stability) are low.

Similarly, scenario-II and VI represent possible outcomes of financial liberalisation. The main focus of financial liberalisation is on economic growth and financial stability, and it is viewed as not addressing the welfare aspect properly. However, most of the developing countries have experienced scenario-VI instead of scenario-II, where growth is achieved to some extent, but welfare and stability have deteriorated. Growth achieved with reduced welfare and increased financial fragility generates socio-economic problems, which subsequently cause severe political problems.

4.2 Hypotheses

As mentioned above, the main objective of this study is to examine the impact of financial liberalisation in Nepal on the national economy in general, and on the financial system in particular. Following the framework presented in the preceding section, the following groups of hypotheses are tested in this study.

Growth: McKinnon (1973) and Shaw (1973) hypothesised that financial liberalisation accelerates economic growth and enhances efficiency through positive interest rates effect on savings and investment. This group of hypotheses is aimed at examining the impact of financial liberalisation measures on the various aspects of growth and efficiency.

The financial liberalisation theory suggests that the removal of entry barriers will lead to an increase in the number of financial institutions in the market and as a result the financial sector will be widened. To examine this assertion, the following hypothesis is tested in the Nepalese context:

H1: Financial liberalisation widened the financial sector in Nepal.

The financial liberalisation theory argues that the deregulation of interest rates will raise real interest rate. The higher real interest rate would stimulate savings and thereby investment, despite the rise of the user cost of capital. To analyse this argument, the following hypothesis is tested:

H2: Financial liberalisation increased domestic savings and investment in Nepal.

Under the financial liberalisation process increased savings, increased investment and increased efficiency is believed to accelerate economic growth and industrial development. In this regard, the following hypothesis is tested:

H3: Financial liberalisation accelerated economic growth and industrial development in Nepal.

The financial liberalisation policy is believed to increase the financial depth of the economy by increasing financial resources available to investors. In this context the following hypothesis is tested:

H4: Financial liberalisation enhanced financial deepening in Nepal.

The positive real interest rate under the financial liberalisation process is argued to improve the resource allocation since the funds are expected to be channelled from inferior projects to high yielding projects. In order to evaluate this argument, the following hypothesis is tested:

H5: Financial liberalisation improved resource allocation in Nepal.

Equality: Equal distribution of income is one of the vital issues in developing countries. The pattern of distribution of income is reflected in employment status and inequality status of an economy. In this regard, the following two hypotheses are tested in this study:

H6: Financial liberalisation increased employment opportunities in Nepal.

H7: Financial liberalisation improved distribution of income in Nepal.

Stability: A strong and stable financial sector can aid in the economic growth of a country. Instability in this sector may bring severe consequences affecting the entire economy. In this study, the following hypothesis is tested in order to examine the impact of the financial liberalisation policy on financial stability:

H8: Financial liberalisation improved financial stability in Nepal.

The testing of the above hypotheses should explain the relationship between various combinations of dependent and explanatory variables. By analysing the nature of such relationships, some inference can be drawn regarding the impact of financial liberalisation.

The above mentioned hypotheses are tested by analysing relevant explanatory variables along with a summary index of the financial liberalisation policy. The index comprises all the components, or policy measures of financial liberalisation. Appropriate proxies or indicators for these components are used wherever suitable. The following section introduces components of the financial liberalisation process in Nepal, and offers a composition of these components as the financial liberalisation index.

4.3 Financial Liberalisation Index

Financial liberalisation is a process that involves the implementation of a number of policies. In order to show the degree or the level of financial liberalisation at a particular time, a financial liberalisation index (FLI) for Nepal is constructed based on principal components method following Bandiera, Caprio *et al.* (2000), and Laeven (2003). Bandiera, Caprio *et al.* (2000) construct a financial liberalisation index for eight developing countries by including eight main components of financial liberalisation in their index, which are (1) interest rates, (2) procompetition measures, (3) reserve requirements, (4) directed credit, (5) banks' ownership, (6) prudential regulation, (7) stock markets, and (8) international financial liberalisation. Laeven (2003) constructs a similar index for 13 developing countries. He includes six measures of financial liberalisation but excludes the measures related to stock markets and external sector in his index. Previously, Demetriades and Luintel (1997) constructed a financial repression

index for India using the principal components method. They included nine different repressionist policies in their index. Following the same method, Laurenceson and Chai (2003) construct a similar financial repression index for China.

In this study, eight major policy components of financial liberalisation have been used to construct the financial liberalisation index for Nepal. The policy components include (1) interest rate deregulation, (2) removal of entry barriers, (3) reduction in reserve requirement, (4) easing in credit controls, (5) introduction of prudential regulations, (6) stock market reform, (7) privatisation of state-owned banks, and (8) external account liberalisation.

The main focus of this study is on domestic financial liberalisation. However, external account liberalisation, which belongs to international financial liberalisation, also has been included in the index since the international market situation may have some influence on the domestic financial market.

In order to derive the financial liberalisation index, some arbitrary value is assigned to each of the financial liberalisation policy variables (Table 4.2). Each policy variable can take a value between 0 and 1. When a particular sector is fully liberalised, that policy variable takes a value of 1 and when that sector remains regulated, it takes a value of 0. To capture the scenario of partial and phase-wise gradual liberalisation of a particular sector, partial values like 0.33, 0.50, and 0.66 have been assigned. A value of 0.50 indicates the first phase of partial deregulation in a two-phased deregulation process, whereas a value 0.33 and 0.66 indicate the first and second phase, respectively, in a three-phased deregulation process. The two-phased process takes a value of 1 in the second phase and the three-phased case takes a value of 1 in the third phase. In other words, if a sector is fully liberalised in a single phase, the value assigned in this case is 1. But if the liberalisation is completed in two phases, then 0.5 is assigned for the first phase and 1 for the second. Similarly, if the liberalisation takes place in three phases, then the number assigned is 0.33 for the first phase, 0.66 for the second phase and 1 for the last phase.

Table 4.2 **Financial Liberalisation Policy Variables**²

<i>Year</i>	<i>IRD</i>	<i>REB</i>	<i>RRR</i>	<i>ECC</i>	<i>IPR</i>	<i>SMR</i>	<i>PSB</i>	<i>EAL</i>
1970	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1971	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1972	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1973	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1975	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1976	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1977	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1978	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1979	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1980	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1981	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1982	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1983	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1984	0.33	1.00	0.00	0.00	0.00	0.00	0.00	0.00
1985	0.33	1.00	0.00	0.00	0.00	0.00	0.00	0.00
1986	0.66	1.00	0.00	0.00	0.00	0.00	0.00	0.00
1987	0.66	1.00	0.00	0.00	0.00	0.00	0.00	0.00
1988	0.66	1.00	0.00	0.00	0.50	0.00	0.00	0.00
1989	1.00	1.00	0.00	0.00	0.50	0.00	0.00	0.00
1990	1.00	1.00	0.00	0.00	0.50	0.00	0.00	0.00
1991	1.00	1.00	0.00	0.50	0.50	0.00	0.00	0.00
1992	1.00	1.00	0.00	0.50	0.50	0.00	0.00	0.00
1993	1.00	1.00	1.00	0.50	0.50	0.00	0.00	0.50
1994	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
1995	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
1996	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
1997	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
1998	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
1999	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
2000	1.00	1.00	1.00	0.50	0.50	1.00	0.00	0.50
2001	1.00	1.00	1.00	0.50	1.00	1.00	0.00	0.50
2002	1.00	1.00	1.00	0.50	1.00	1.00	0.00	0.50
2003	1.00	1.00	1.00	0.50	1.00	1.00	0.50	0.50

Note: Number assigned - 0 for none, 1 for full, and 0.33, 0.50 and 0.66 for partial-gradual deregulation.

The description of the policy variables and their implementation date are presented below.

² See Appendix A, Table A.1 for quarterly data.

- IRD** (Interest Rate Deregulation) – Interest rate partially deregulated with ceilings in 1984, ceilings removed in 1986, and completely deregulated in 1989.
- REB** (Removal of Entry Barriers) – 1984.
- RRR** (Reduction in Reserve Requirements) – 1993.
- ECC** (Easing in Credit Controls) – 1991. Some control still exists, as commercial banks are required to channel certain portions of their loan portfolio to a productive sector and rural sector.
- IPR** (Implementation of Prudential Rules) – A set of prudential rules implemented in 1988. But the central bank became independent only in 2001.
- SMR** (Stock Market Reform) – Floor trading of stocks started in 1994.
- PSB** (Privatisation of State-owned Banks) – At the initial phase, the managements of two ailing state-owned banks were given to foreign parties on contract in August 2002; and it has been planned to privatise the ownership of these banks after their financial health becomes better under the new management.
- EAL** (External Account Liberalisation) – The current account became fully convertible in 1993, but the capital account by and large still remains inconvertible.

From the values presented in Table 4.2, the financial liberalisation index (FLI) for Nepal is derived. To this end, the weight of each of the components is calculated by employing the principal component method. The composition of the FLI can be expressed in the following terms:

$$FLI_t = w_1IRD_t + w_2REB_t + w_3RRR_t + w_4ECC_t + w_5IPR_t + w_6SMR_t + w_7PSB_t + w_8EAL \quad (4.1)$$

where w_i is the weight of the component given by the respective eigenvector of the selected principal component.

The eigenvalues and eigenvectors of the correlation matrix of financial liberalisation policy variables are as follows:

**Table 4.3 Eigenvalues and Eigenvectors of the
Correlation Matrix of Policy Variables**

<i>Variables</i>	<i>Eigenvectors (λ_k)</i>		
	λ_1	λ_2	λ_3
IRD	0.373	0	0.477
REB	0.334	0	0.589
RRR	0.394	0	0.325
ECC	0.393	0	0.079
IPR	0.377	0	0.189
SMR	0.381	0	0.380
PSB	0.000	1	0.000
EAL	0.390	0	0.366
<i>Eigenvalues (λ_k)</i>	5.558	1	0.935

Taking the first principal component (λ_1), which accounts for 74 per cent of the total variance³, in the eight policy variables and substituting the respective eigenvalues for w_i 's in equation (4.1):

$$\begin{aligned}
 FLI_t = & 0.373IRD_t + 0.334REB_t + 0.394RRR_t + 0.393ECC_t + 0.377IPR_t \\
 & + 0.381SMR_t + 0.000PSB_t + 0.390EAL_t
 \end{aligned} \tag{4.2}$$

The index for the individual policy components are calculated by substituting the values for IRD, REB, RRR, ECC, IPR, SMR, PSB and EAL in equation (4.2) from Table 4.2 and multiplying by the respective values of w . The financial liberalisation index for each year is derived by summing up the calculated values of all the eight policy components for the respective year. The calculated individual and total index are presented in the Table 4.4.

³ $\Sigma\lambda_K = 5.558 + 1.000 + 0.935 = 7.493$. $\lambda_1 = 5.558/7.493 = 0.74$.

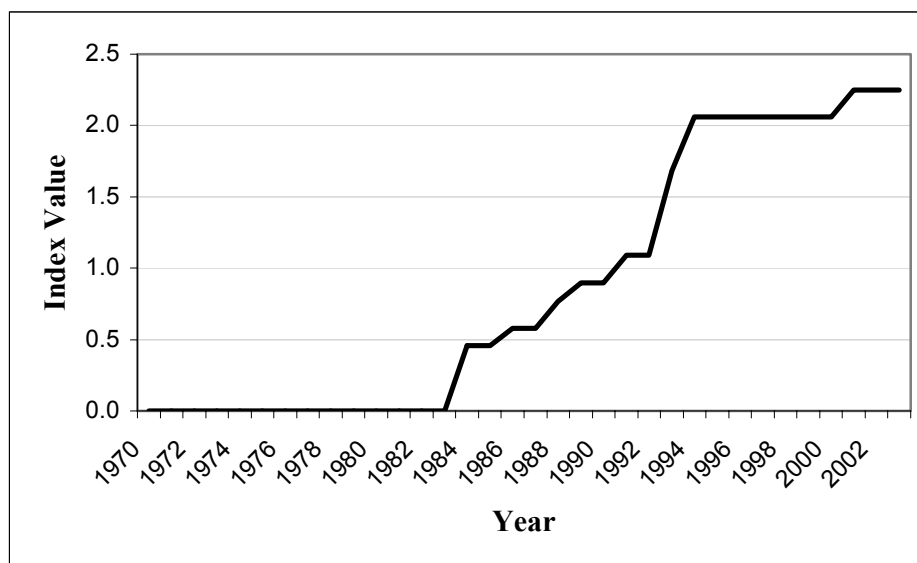
Table 4.4 **Financial Liberalisation Index (FLI) for Nepal**⁴

<i>Year</i>	<i>IRD</i>	<i>REB</i>	<i>RRR</i>	<i>ECC</i>	<i>IPR</i>	<i>SMR</i>	<i>PSB</i>	<i>EAL</i>	<i>FLI</i>
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0.123	0.334	0	0	0	0	0	0	0.457
1985	0.123	0.334	0	0	0	0	0	0	0.457
1986	0.246	0.334	0	0	0	0	0	0	0.580
1987	0.246	0.334	0	0	0	0	0	0	0.580
1988	0.246	0.334	0	0	0.189	0	0	0	0.769
1989	0.373	0.334	0	0	0.189	0	0	0	0.896
1990	0.373	0.334	0	0	0.189	0	0	0	0.896
1991	0.373	0.334	0	0.197	0.189	0	0	0	1.092
1992	0.373	0.334	0	0.197	0.189	0	0	0	1.092
1993	0.373	0.334	0.394	0.197	0.189	0	0	0.195	1.681
1994	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
1995	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
1996	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
1997	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
1998	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
1999	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
2000	0.373	0.334	0.394	0.197	0.189	0.381	0	0.195	2.062
2001	0.373	0.334	0.394	0.197	0.377	0.381	0	0.195	2.251
2002	0.373	0.334	0.394	0.197	0.377	0.381	0	0.195	2.251
2003	0.373	0.334	0.394	0.197	0.377	0.381	0	0.195	2.251

The figure of the financial liberalisation index (FLI) given in the last column of the above table is presented in Figure 4.2.

⁴ Quarterly FLI used in empirical tests. See Appendix A, Table A.2.

Figure 4.2 **Financial Liberalisation Index**



The above figure reveals that the decade of 1984 – 1994 was the main period of the implementation of financial liberalisation measures in Nepal.

As discussed, earlier financial liberalisation comprises eight different policy components. The effects of the implementation of these policy components are reflected in the change of certain variables. In this context, analysing such a reflection is particularly useful in examining the impact of the individual policy component. Since FLI is unobservable, the policy makers basically use the individual components for the policy changes. From this view point also, the study of the individual components also become important regarding the impact evaluation of the financial liberalisation.

The variables used in this study as the indicators of various policy components are given in Table 4.5.

It is assumed that implementation of a policy component would directly bring some change in the respective indicators. In such a case, policy implementation itself means manipulating the indicator. Such an indicator is not available for two policy components IPR and PSB.

In order to evaluate the policy impact, summary index of financial liberalisation (FLI) and the respective indicators of the individual policy components are used wherever appropriate.

Table 4.5 **Policy Components and Indicators**

<i>S.N.</i>	<i>Policy Component</i>	<i>Indicator(s)</i>
1.	Interest Rate Deregulation (IRD)	Interest Rates (deposit, lending, refinance)
2.	Removal of Entry Barriers (REB)	Population density per bank branch
3.	Reduction in Reserve Requirement (RRR)	Statutory liquidity requirement and cash reserve requirement rate
4.	Easing in Credit Controls (ECC)	Bank credit to private sector <i>vis-a-vis</i> the public sector
5.	Implementation of Prudential Rules (IPR)	None
6.	Stock Market Reform (SMR)	Market capitalisation value
7.	Privatisation of State-owned Banks (PSB)	None
8.	External Account Liberalisation (EAL)	Foreign direct investment and balance of payments statistics

The following sections introduce dependent and explanatory variables related to each hypothesis and present the econometric framework for testing these hypotheses.

4.4 Financial Sector Widening

The first group of hypotheses outlined in section 4.2 is aimed at examining the impact of financial liberalisation on various aspects of growth and efficiency. This section sheds light on the effects of liberalisation, particularly on the financial sector widening.

One of the expected outcomes of financial liberalisation is a widening of the financial sector. It is assumed that as entry barriers are removed, new banks and other financial institutions grow in number and size of activity, and thus the financial sector gets widened. As a consequence, the financial services become easily available to a larger population. To examine this hypothesis, i.e., whether the financial liberalisation has helped widen the financial sector in Nepal, the data on the total volume of bank transactions is analysed. The total volume of bank transactions (VBT) is defined as:

$$VBT = TDB + TCB \quad (4.3)$$

where,

TDB = Total deposits of commercial banks that include demand deposit, saving deposit, and fixed deposit; and,

TCB = Total credit extended by commercial banks to the private sector as well as the public sector.

It is assumed that the volume of bank transactions can reflect the degree of financial sector widening. Main indicators of financial sector widening include extended banking services, positive real deposit rate, increased credit availability, and increased inflow of foreign capital. When the banking services get extended to a larger population, it is natural to see an increased volume of bank transactions reflected in bank deposits and credits. When there is a real positive deposit interest rate, it is expected that the savings will increase, which is also reflected in the bank deposits. Credit is one of the main components of bank transactions. Hence, increased credit availability is, obviously, reflected in the total volume of bank transactions. Similarly, since foreign capital inflow normally comes through the banking channel, it is also captured in the total volume of bank transaction. Therefore, in this study, the total volume of the bank transaction (VBT) is taken as a proxy of financial sector widening.

It can be argued that a certain amount of financial sector widening takes place even in a non-liberalised financial system due to the upward trending nature of economic activities. However, if financial liberalisation has a positive effect on financial sector widening, then the speed of the widening process must be faster in a liberalised regime than in a non-liberalised regime. Examining the relationship between relevant variables can portray this picture.

As mentioned above, the total volume of the bank transaction (VBT) is used here as the proxy of financial sector widening. The relationship between VBT and FLI can be analysed by using the following equations:

$$VBT_t = \alpha_1 + \alpha_2 GDPR_t + \alpha_3 IRR_t + \alpha_4 PBB_t + \alpha_5 FLI_t + e_t \quad (4.4)$$

where α_1 is the intercept, α_2 , α_3 , α_4 , and α_5 are the coefficients of the respective variables, and e_t is the white noise which is assumed to be normally distributed with mean and variance 0 and σ^2 , respectively.

In the above equation, real gross domestic product (GDP), real interest rate (IRR), and average population density per bank branch (PBB) also have been included as these are the key determinants of the volume of the bank transaction (VBT). Besides,

IRR and PBB can depict the effect of the individual policy components related to these variables.

Using the natural log (L) form, the above equation can be written as follows:

$$LVBT_t = \alpha_1 + \alpha_2 LGDPR_t + \alpha_3 IRR_t + \alpha_4 LPBB_t + \alpha_5 FLI_t + e_t \quad (4.5)$$

In this equation, IRR and FLI are at level form, as some of the observations of these variables are zero or negative, and these cannot be converted into the log form. The expected signs of the coefficients α_2 , α_3 , and α_5 are positive, whereas that of α_4 is negative. The signs of α_3 , α_4 and α_5 are specifically critical in testing the hypothesis H1 outlined in section 4.2.

4.5 Interest Rate, Savings and Investment

In order to test the McKinnon-Shaw hypothesis of financial liberalisation, the relationship between interest rates, bank savings, and bank credits are analysed. The following equation is used to examine the interest rate effect on savings.

$$TDR_t = \alpha_6 + \alpha_7 GDPR_t + \alpha_8 DRR_t + \alpha_9 PBB_t + \alpha_{10} FLI_t + e_t \quad (4.6)$$

In this equation, the regressand is real time deposits held at banks (TDR) and the regressors include a real gross domestic product (GDPR), a real deposit rate (DRR), an average population density per bank branch (PBB) and a financial liberalisation index (FLI). This equation can be rewritten in the natural log form as follows:

$$LTDR_t = \alpha_6 + \alpha_7 LGDPR_t + \alpha_8 DRR_t + \alpha_9 LPBB_t + \alpha_{10} FLI_t + e_t \quad (4.7)$$

In the above equation, the coefficients α_7 , α_8 , and α_{10} are expected to be positive while the coefficient of α_9 is expected to be negative. The signs of α_8 , and α_{10} being positive and at the same time that of α_9 being negative would mean that the first part of the hypothesis H2 can not be rejected.

To examine the effect of interest rate on investment, the following relationship is also analysed.

$$TBCR_t = \alpha_{11} + \alpha_{12} TDR_t + \alpha_{13} LRR_t + \alpha_{14} RFR_t + \alpha_{15} BCBR_t \\ + \alpha_{16} PBB_t + \alpha_{17} FLI_t + e_t \quad (4.8)$$

where,

$TBCR$ = Real Total Bank Credit (credit extended by banks to the private sector as well as to the public sector)

TDR = Real Time Deposits (saving and fixed deposits at banks)

LRR = Real Lending Rate (average of the various category lending rates)

RFR = Real Refinance Rate (interest rate charged by the central bank on the refinance credit provided to banks)

$BCBR$ = Real Borrowing by banks from the Central Bank, which also includes refinance credit

PBB = Average population density per bank branch (total population divided by total number of bank branches)

Real total bank credit (TBCR) is used here as the proxy of the investment. The equation can be transformed into the following natural log form:

$$LTBCR_t = \alpha_{11} + \alpha_{12}LTDR_t + \alpha_{13}LRR_t + \alpha_{14}RFR_t + \alpha_{15}BCBR_t + \alpha_{16}LPBB_t + \alpha_{17}FLI_t + e_t \quad (4.9)$$

In the above equation, LRR, RFR, and BCBR are in level form, as some of the observations in these variables are zero or negative. The signs of the coefficients α_{12} , α_{15} and α_{17} are expected to be positive, while the signs of the coefficients α_{13} , α_{14} and α_{16} are expected to be negative. The signs of α_{15} and α_{17} being positive and at the same time the sign of α_{16} being negative would lead to non-rejection of the second part of the hypothesis H2.

4.6 Economic Growth and Industrial Development

The ultimate objective of implementing the financial liberalisation policy is to achieve a higher rate of economic growth and industrial development. In an agriculture-based economy like Nepal, the issue of industrial development becomes crucial for the sustainable long-run economic growth.

To examine the impact of financial liberalisation on the economic growth, the following relationship is estimated:

$$GDPP_t = \alpha_{18} + \alpha_{19}FD_t + \alpha_{20}IRR_t + \alpha_{21}FLI_t + e_t \quad (4.10)$$

where,

$GDPP$ = Per capita real gross domestic product

FD = Financial depth proxied by the ratio of total bank deposit liabilities divided by nominal gross domestic product

IRR = Real Interest Rate proxied by one-year saving deposit rate

Equation (4.10) can be transformed into natural log form as follows:

$$LGDPP_t = \alpha_{18} + \alpha_{19}LFD_t + \alpha_{20}IRR_t + \alpha_{21}FLI_t + e_t \quad (4.11)$$

In the above equation, α_{19} , α_{20} and α_{21} are expected to be positive. The signs of all these coefficients being positive would mean that the first part of the hypothesis H3 is not rejected.

The Gross Domestic Product (GDP) can be segregated into agricultural and non-agricultural GDP. The agriculture sector consists of agriculture, fisheries and forestry, whereas the non-agriculture sector consists of 8 different sub-sectors: viz 1) mining and quarrying, 2) manufacturing, 3) electricity, gas, and water; 4) construction, 5) trade, restaurants, and hotels; 6) transport, communication and storages; 7) financial and real estate; and, 8) community and social services. Non-agricultural GDP, excluding the community and social services sub-sector, can be used as a proxy for industrial development. To analyse the effects of financial liberalisation on industrial development, the following relationship is examined:

$$NGDPR_t = \alpha_{22} + \alpha_{23}TBCR_t + \alpha_{24}IRR_t + \alpha_{25}FLI_t + e_t \quad (4.12)$$

where,

$NGDPR$ = Real non-agriculture GDP (Contribution of Community and Social Services sub-sector excluded)

Equation (4.11) is transformed into the following natural log form:

$$LNGDPR_t = \alpha_{22} + \alpha_{23}LTBCR_t + \alpha_{24}IRR_t + \alpha_{25}FLI_t + e_t \quad (4.13)$$

In order to support the second part of the hypothesis H3, the signs of the coefficients of LTBCR, IRR, and FLI (viz α_{23} , α_{24} and α_{25}) should not be negative.

4.7 Financial Development

The main emphasis of financial liberalisation lies on the financial development of a country. A highly developed financial system is regarded as a catalyst to economic growth and development. The level of financial development is indicated by the level of financial depth. Such depth is proxied by the ratio of bank deposit liabilities to nominal GDP (King and Levine 1993a; Demetriades and Luintel 1996a; 1996b; 1997). To examine the impact of financial liberalisation on financial development, we analyse the following relationship:

$$FD_t = \alpha_{26} + \alpha_{27}GDPP_t + \alpha_{28}VBTP_t + \alpha_{29}IRR_t + \alpha_{30}PBB_t + \alpha_{31}FLI_t + e_t \quad (4.14)$$

In the above equation, VBTP is the per capita volume of bank transactions. All the other variables included in this equation have been used in the previous equations too, and discussed in respective sections above. The equation can be rewritten in the natural log form as follows:

$$LFD_t = \alpha_{26} + \alpha_{27}LGDPP_t + \alpha_{28}LVBTP_t + \alpha_{29}IRR_t + \alpha_{30}LPBB_t + \alpha_{31}FLI_t + e_t \quad (4.15)$$

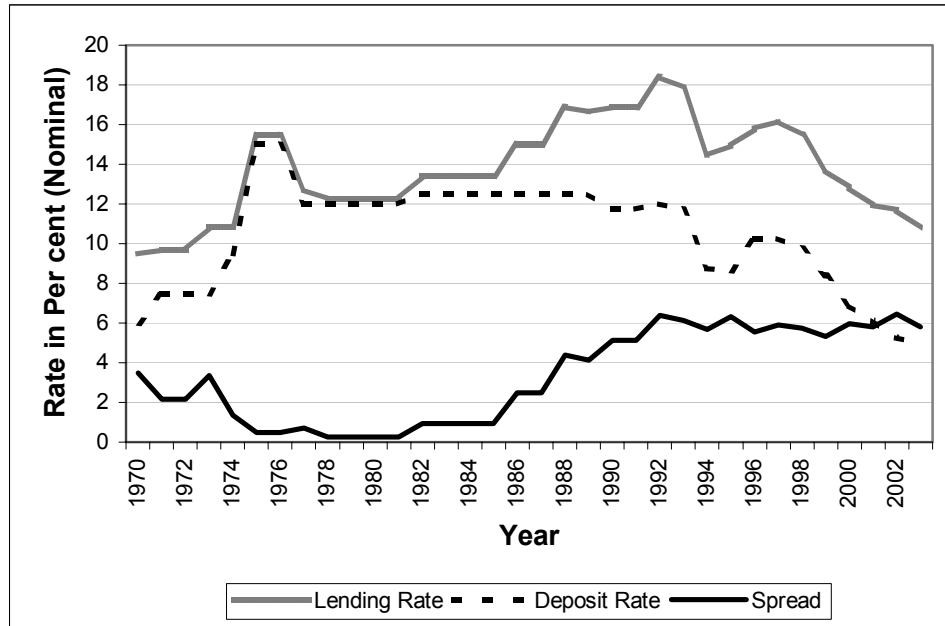
The expected signs of α_{27} , α_{28} , α_{29} and α_{31} are positive, and that of α_{30} is negative. The positive signs of α_{28} , α_{29} and α_{31} , and negative sign of α_{30} would lead to non-rejection of the hypothesis H4.

4.8 Efficiency in Resource Allocation

Another expected outcome of financial liberalisation is efficiency in financial administration and in resource allocation. To achieve a higher economic growth, it is necessary that the scarce financial resources be allocated efficiently in a manner ensuring highest productivity.

The administrative efficiency of the financial sector can be reflected in the interest rate spread of banks. The interest rate spread is the gap between the lending rate and the deposit rate. A higher deposit rate is preferred by the depositors, whereas a lower lending rate is preferred by the borrowers. In this context, the volume of both the deposit and lending can be increased by a lower interest rate spread. Such a lower interest rate is possible when the banks increase their administrative efficiency and reduce the administrative cost. Figure 4.3 below shows the interest rate movements in Nepal during the period of 1970-2003.

Figure 4.3 Interest Rate Movement in Nepal



The above graph clearly shows that the interest rate spread increased along with the implementation of the financial liberalisation policy. The spread is much higher in the post-liberalisation regime (after 1984) compared to that in the pre-liberalisation regime (before 1984). This situation is undesired and unexpected and suggests that the financial liberalisation policies have not been able to exert a healthy competition in the financial system.

The McKinnon-Shaw school hypothesize that interest rate deregulation leads to a higher or positive deposit and lending rates. The higher lending rate in turn helps in moving scarce financial resources from low yielding projects to high yielding ones. In the Nepalese case, the data on project-wise return is not available, so a direct test of interest rate effects on investment is not possible.

It is a common assumption that the private sector is more efficient than public sector in utilising the financial resources, and that efficiency can be reflected in the growth of the non-agricultural GDP. From this point of view, the relationship between the share of the bank credit to private sector and the share of the non-agricultural GDP in terms of total GDP can portray a picture of the impact of financial liberalisation on resource allocation.

To examine the impact mentioned above, the following equation is estimated:

$$SNGDP_t = \alpha_{32} + \alpha_{33}SBCP_t + \alpha_{34}IRR_t + \alpha_{35}PBB_t + \alpha_{36}FLI_t + e_t \quad (4.16)$$

where,

$SNGDP$ = Share of the non-agricultural GDP in total GDP

$SBCP$ = Share of bank credit to private sector in total bank credit

In the above equation, IRR, PBB and FLI are included for the complete information. The natural log form of the equation is as follows:

$$LSNGDP_t = \alpha_{32} + \alpha_{33}LSBCP_t + \alpha_{34}IRR_t + \alpha_{35}LPBB_t + \alpha_{36}FLI_t + e_t \quad (4.17)$$

In order to support the hypothesis H5, the coefficients of LSBCP, IRR and FLI should be positive and the coefficient of LPBB should be negative.

4.9 Employment Opportunities

As mentioned earlier, about 80 per cent of the population of the country is engaged in the agriculture sector. Disguised unemployment is prevalent in this sector as more people are actually needed than normally engage in a small piece of family owned land, mainly due to the lack of other employment opportunities. Industry and service are the other sectors generating full time employment opportunities. Regarding the employment status, the labour force of the country can be divided into three groups, viz fully employed, underemployed (disguised unemployment), and fully unemployed. Table 4.6 shows the employment status during 1997 – 2001.

Table 4.6 **Employment Status**

(Population in Thousand)

<i>Detail</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>
Total Labour Force	9,888	9,938	10,185	10,300	10,416
Fully Unemployed Population	366	417	397	340	521
Percentage	3.7	4.2	3.9	3.3	5.0
Underemployed Population	4,381	4,382	4,389	4,385	3,333
Percentage	46.3	45.6	44.7	43.4	32.3
Underemployed Population as Full Unemployed Equivalent ⁵ (Percentage)*	14.8	14.7	14.4	14.2	12.4
Total Unemployment	18.5	18.9	18.3	17.5	17.4

Source: Economic Survey 2002; 2003, His Majesty's Government of Nepal, Ministry of Finance

* Calculated

⁵ Disguised unemployment or underemployment is defined as employment for less than 8 months in a year. The under employment of 4,381 thousand people in 1997 is approximately equal to full employment of $[(4,381 \times 8)/12] = 2,921$ thousand, i.e., full unemployment of 1,460 thousand people.

The data on the employment status is not available for the studied period. Due to this difficulty, the impact of financial liberalisation on employment cannot be evaluated directly. So, as an alternative, the data on bank credit to the employment generating sectors, viz, the agriculture, industry and service sectors are analysed to get the impression of change in the employment status as a result of the financial liberalisation. The simple assumption behind this is that increased bank credit would result in increased employment opportunities, in these sectors. In fact, increased capital does not necessarily result into increased employment opportunities since such capital might be used for other inputs. For example, the additional capital in the agricultural sector might be used in purchasing agricultural inputs like improved seeds, fertilizer, pesticides, tools and equipment, and or in acquiring land. However, since the traditional farming system in Nepal has not seen that much technological change, it can be assumed that the additional capital would be spent on additional labour and other agricultural inputs, at least proportionately. In the case of the industry and service sectors, increased capital flow also may indicate growing numbers of enterprises and/or increased production. In both cases, it can be assumed that new or additional labour will be used.

$$PBCIA_t = \alpha_{37} + \alpha_{38}FD_t + \alpha_{39}IRR_t + \alpha_{40}PBB_t + \alpha_{41}FLI_t + e_t \quad (4.18)$$

where,

$PBCIA$ = Per capita bank credit to industry sector and agriculture sector

According to their concentration, the agriculture sector portrays the picture of the rural area, and the industry and service sectors depict the situation in the urban area. As PBCIA is composed of both industrial sector credit and agricultural sector credit, it gives the impression of changes in employment opportunity in both the rural as well as the urban area.

The natural log form of equation (4.18) is given below:

$$LPBCIA_t = \alpha_{37} + \alpha_{38}LFD_t + \alpha_{39}IRR_t + \alpha_{40}LPBB_t + \alpha_{41}FLI_t + e_t \quad (4.19)$$

The signs of the coefficients of LFD and FLI are expected to be positive, while that of the coefficient of LPBB is expected to be negative. In the case of the coefficient of IRR, the sign may be positive or negative. If the signs of α_{38} and α_{41} are negative and that of α_{40} is positive, then the hypothesis H6 is rejected.

4.10 Poverty Alleviation and Redistribution of Income

The financial sector may help alleviate poverty by providing credit facilities to the poor sections of the population. Similarly, moving the financial resources from the urban areas in order to promote investment in the rural areas can facilitate the redistribution of income, as most of the rich people live in the urban areas and most of the poor in the rural areas.

Poverty line is defined as the annual per capita income of Nepalese rupees (NRs) 4,404 at 1995/96 prices⁶. Therefore, the population with the annual per capita income of less than NRs 4404 fall below the poverty line. Table 4.7 depicts the poverty scenario of Nepal.

Table 4.7 Poverty Scenario of Nepal

<i>Fiscal Year</i>	<i>Poverty Incidence (%)</i>	<i>Gini Coefficient</i>
1977	36.0	NA
1985	41.2	0.3000
1991	49.0	NA
1997	42.0	0.3500
1998	41.5	0.3535
1999	40.1	0.3540
2002	38.1	0.3575

Source: Midterm Evaluation of the Ninth Plan (1997-2002); Nepal Human Development Report 1998; Nepal Human Development Report 2001

The available data on poverty shows that poverty incidence in Nepal increased persistently until 1991, then started to decrease gradually. But the inequality in income distribution, measured by the gini coefficient⁷, is constantly increasing.

Since the majority of the poor live and work in rural areas, the flow of credit to rural areas may be taken as one of the indicators of the financial sector's role in

⁶ 1 US\$ = NRs 57.03.

⁷ Gini coefficient value 0 refers to the equal distribution, and value 1 refers to the extremely unequal distribution of income.

redistribution of income and poverty alleviation (Acharya 2003, p.147). In this regard, the credit against the security of agriculture products and the credit against the security of gold and silver are of significant importance. It should be noted that since the credits on the security of gold and silver are small credits and the administrative procedures involved are straightforward, this credit is easily accessible by the poor. Due to the cultural values and social practices, the poor also tend to possess some gold and silver as ornament, but such possession is very small in quantity. Therefore, the credit against the security of agricultural products and gold and silver are the credits used mainly by the poor population, and can be treated as the proxy of the bank credit to poor population (BCPP).

It can be argued that the bank's indebtedness may make one's financial position worse. But if the person were to depend on the local moneylender, his or her financial position would become much worse because of the high interest rate charged on the credit. It is the general assumption that increased bank credit to the poor population will help increase the employment, productivity and income of the poor; and thus help the redistribution of income, and poverty reduction process.

In this regard, to evaluate the impact of financial liberalisation on the redistribution of income and poverty reduction, the following relationship is tested:

$$SBCPP_t = \alpha_{42} + \alpha_{43}FD_t + \alpha_{44}IRR_t + \alpha_{45}PBB_t + \alpha_{46}FLI_t + e_t \quad (4.20)$$

where,

SBCPP = Share of the bank credit to the poor population (credit against the security of agricultural products and gold and silver)

Equation (4.20) can be presented in the natural log form as follows:

$$LSBCPP_t = \alpha_{42} + \alpha_{43}LFD_t + \alpha_{44}LIRR_t + \alpha_{45}LPBB_t + \alpha_{46}LFLI_t + e_t \quad (4.21)$$

In the above equation, α_{43} and α_{46} are expected to be positive whereas α_{45} is expected to be negative. In the case of α_{44} , the sign can either be positive or negative. If the coefficients α_{43} and α_{46} are positive, and α_{45} is negative, then the hypothesis H7 is not rejected.

4.11 Financial Stability

Financial liberalisation is alleged to be prone to financial fragility, as several evidences from developing as well as developed countries have pointed out the destabilizing consequences of the policy. In many countries, financial liberalisation has

been followed by a currency and banking crisis. Increased competition, lower profits, freedom to take high risk, easy access to risky resources, misallocation of resources, unfavourable capital movement, moral hazard problems, and increased exchange rate volatility have been the reasons behind such crises.

Reducing government capital spending also could have potentially adverse effects upon the economy's infrastructure and impede economic performance. The reason is that governments provided infrastructure might complement private capital and thus improves its productivity (Harvey and Kearney 1994, Aschauer 1989).

The financial stability is reflected in the performance of the banking system, which is specifically related to the loan performances, and which can be shown by the figures of return on the bank assets and amount of the bad loans. In the Nepalese context, the data on return on the bank assets and bad loans, or the non-performing assets (NPA) are not available for the required time period. Therefore, as an alternative, the following relationship is analysed in order to examine the link between financial liberalisation and financial fragility in Nepal.

$$CDR_t = \alpha_{47} + \alpha_{48}LRR_t + \alpha_{49}PBB_t + \alpha_{50}FLI_t + e_t \quad (4.22)$$

where,

CDR = Credit-deposit ratio of banks (total credit extended by banks divided by the total deposit liabilities)

The above equation can be transformed in the following natural log form:

$$LCDR_t = \alpha_{47} + \alpha_{48}LRR_t + \alpha_{49}LPBB_t + \alpha_{50}FLI_t + e_t \quad (4.23)$$

In order to support the hypothesis H8, the coefficients of LRR and FLI need to be positive, while the coefficient of LPBB should be negative.

4.12 Nature and Sources of Data

In this study, 19 different variables are analysed⁸. Out of them, 18 are economic time series related to macroeconomic and banking sectors, and the remaining variable is the policy variable, which is a composite index of the eight different financial liberalisation policy measures.

This study covers a period of 34 years ranging from 1970 to 2003. Therefore, most of the data covers this period. However, due to unavailability, the data related to

⁸ See Appendix B for the Graph of these variables.

non-agricultural gross domestic product (LNGDPR and LSNGDP) cover the period of 28 years, from 1976 to 2003. Similarly, the time series related to the type of bank credits (LPBCIA and LSBCPP) cover the period of 26 years, from 1976 to 2001. Due to the introduction of a new classification of bank credit, the data for these time series are not available since 2002.

In this study, quarterly data have been used starting from the first quarter (Q1) of 1970 to the fourth quarter (Q4) of 2003, covering a total 136 quarters. However, as mentioned above, in the case of non-agricultural GDP related data, it ranges from Q1 in 1976 to Q4 in 2003, covering a total 112 quarters. Similarly, the data on the two bank-credit related time series cover a total of 104 quarters as these data ranges from Q1 in 1976 to Q4 in 2001.

All the data except gross domestic product related time series, *viz*, LGDP and LNGDP are available in a quarterly frequency. To make the data compatible with other time series, the frequency of these two series (LGDP and LNGDP) have been converted from annual to quarterly, following the quadratic-match sum method (EViews 5 User's Guide 2004, pp 107-112). Similarly, population data, which has been used to convert some time series into *per capita* terms, also has been converted from annual to quarterly frequency using the same method.

Most of the macroeconomic data are obtained from the Economic Survey published every year by His Majesty's Government of Nepal, Ministry of Finance. Banking data are taken from the Quarterly Economic Bulletin published by Nepal Rastra Bank, the central bank of Nepal. The data on the number of bank branches for 1970:Q1 to 1975:Q3 have been obtained from Nepal Bank Limited and Rastriya Banijya Bank, since the Quarterly Economic Bulletin publishes the data on bank branches only for the period 1975:Q4 onwards. International Financial Statistics database and Asian Development Bank database also are utilised for the data on some of the macroeconomic time series. In order to compile the data on policy variables, the policy implementation dates have been taken from various publications from the Nepal Rastra Bank.

A summary statistics of the data set is presented in Table 4.8 below.

Table 4.8 **Summary Statistics of Data Set**

<i>S.N.</i>	<i>Variable</i>	<i>No. of Observations</i>	<i>Average</i>	<i>Median</i>	<i>Standard Deviation</i>
1	FLI	136	0.8770	0.6140	0.8987
2	LVBT	136	10.7014	10.7416	1.0246
3	LGDP _r	136	10.5080	10.4139	0.3968
4	IRR/DRR	136	1.6605	1.7700	5.5764
5	LPBB	136	10.9819	10.8084	0.4098
6	LTD _r	136	9.8572	9.9777	1.1162
7	LTBC _r	136	9.8145	9.8299	1.0451
8	LR _r	136	4.9815	5.5908	5.7291
9	RFR	136	0.5156	1.4922	5.6550
10	BCB _r	136	404.2065	114.2844	517.2653
11	LGDP _P	136	7.6661	7.5945	0.1840
12	LFD	136	-0.3422	-0.2239	0.6502
13	LNGDP _r	112	9.8553	9.9335	0.6269
14	LVBTP	136	7.8595	7.9018	0.8071
15	LSNGDP	112	-0.7492	-0.6519	0.2638
16	LSBCP	136	-0.2150	-0.2213	0.1326
17	LPBCIA	104	5.7729	5.8625	1.1714
18	LSBCPP	104	-1.4306	-1.3119	0.3390
19	LCD _r	136	-0.3512	-0.3668	0.1515

Among the total nineteen variables, FLI, IRR/DRR, LR_r, RFR and BCB_r are expressed in the level form while the rest fourteen variables are in the natural log. The table reflects a wide dispersion of FLI, IRR/DRR, LR_r, RFR, BCB_r and LFD, as their standard deviations are greater than the averages.

Chapter 5

UNIT ROOT TEST

As the long-term relationship between various time series and the pattern of effect of one variable on another variable will be analysed, cointegration and causality tests between various sets of variables will be conducted. Before starting the cointegration and causality tests, it is essential to check each time series for stationarity. If a time series is non-stationary, the regression analysis done in a conventional way will produce spurious results¹. Therefore, in order to examine this property of the time-series, the unit root test is conducted first. In this chapter, various methods and models of unit root test are discussed and the test results are presented. In section 1, stationarity and nonstationarity of the time series are discussed. Section 2 presents various unit root test methods with and without structural change. In section 3, a sequential procedure for the unit root test is developed. Finally, the unit root test statistics are presented and the results are analysed in section 4.

5.1 Stationarity and Nonstationarity

A time series is considered to be stationary if its mean and variance are independent of time. If the time series is non-stationary, i.e., having a mean and or variance changing over time, it is said to have a unit root. Therefore, the stationarity of a time series is examined by conducting the unit root test.

A non-stationary time series can be converted into a stationary time series by differencing. If a time series becomes stationary after differencing one time, then the time series is said to be integrated of order one and denoted by $I(1)$. Similarly, if a time series has to be differenced d times to make it stationary, then it is called integrated of

¹ In regressing a time series variable on another time series variable, the test statistics may often show a significant relationship between these variables even though no such relationship exists between them. This type of regression is known as 'spurious regression'. According to Granger and Newbold (1974), an R^2 greater than the Durbin-Watson value is a good rule of thumb to suspect that the estimated regression is spurious.

order d and written as $I(d)$. As the stationary time series needs not to be differenced, it is denoted by $I(0)$.

5.2 Unit Root Test Methods

There are several methods available for the unit root test. This section briefly discusses these methods and models. Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF), and Phillip-Perron (PP) test methods are commonly used to examine the stationarity of a time series.

The Dickey-Fuller (DF) model is as follows:

$$y_t = \mu + \alpha y_{t-1} + e_t \quad 5.1$$

Where μ is an intercept and e_t is a white noise. In this model, the null hypothesis is $\alpha = 1$ (nonstationary series) against the alternative hypothesis of $\alpha < 1$ (stationary series).

The error term in the DF test might be serially correlated. The possibility of such serial correlation is eliminated in the following Augmented Dickey-Fuller model:

$$\Delta y_t = \mu + \delta y_{t-1} + \sum_{i=1}^k \beta_i \Delta y_{t-i} + e_t \quad 5.2$$

where $\delta = \alpha - 1$

The null hypothesis of ADF is $\delta = 0$ against the alternative hypothesis of $\delta < 0$. Non-rejection of the null hypothesis implies that the time series is nonstationary, whereas rejection means the time series is stationary.

Phillips and Perron (1988) have suggested a nonparametric test as an alternative to the ADF test. Although the ADF test has been reported to be more reliable than the PP test, the problem of size distortion and the low power of the test make both these tests less useful (Maddala and Kim 2003, p.81,98).

Perron (1989) introduced the concept of structural change in the unit root test. He shows that inclusion of structural change in the unit root test might give a different result. He conducted unit root test employing his model on Nelson and Plosser (1982) data and found that 11 of the 14 series were stationary. In his model, he allows one time structural change to occur at a time T_B ($1 < T_B < T$).

Following are the models developed by Perron (1989) for three different cases:

Null Hypothesis:

$$\text{Model (A)} \quad y_t = \mu + dD(TB)_t + y_{t-1} + e_t \quad 5.3$$

$$\text{Model (B)} \quad y_t = \mu_1 + y_{t-1} + (\mu_2 - \mu_1)DU_t + e_t \quad 5.4$$

$$\text{Model (C)} \quad y_t = \mu_1 + y_{t-1} + dD(TB)_t + (\mu_2 - \mu_1)DU_t + e_t \quad 5.5$$

Where $D(TB)_t = 1$ if $t = T_B + 1$, 0 otherwise, and

$$DU_t = 1 \text{ if } t > T_B, \text{ 0 otherwise.}$$

Alternative Hypothesis:

$$\text{Model (A)} \quad y_t = \mu_1 + \beta t + (\mu_2 - \mu_1)DU_t + e_t \quad 5.6$$

$$\text{Model (B)} \quad y_t = \mu + \beta_1 t + (\beta_2 - \beta_1)DT_t^* + e_t \quad 5.7$$

$$\text{Model (C)} \quad y_t = \mu_1 + \beta_1 t + (\mu_2 - \mu_1)DU_t + (\beta_2 - \beta_1)DT_t + e_t \quad 5.8$$

Where $DT_t^* = t - T_B$, and $DT_t = t$ if $t > T_B$, 0 otherwise.

The first model (Model A) permits an exogenous change in the level of the series, whereas the second model (Model B) permits an exogenous change in the rate of growth. The third model (Model C) allows change in both.

Perron (1989) models include one known structural break. These models cannot be applied where such breaks are unknown. Therefore, this procedure is criticised for assuming a known break date, which raises the problem of pre-testing and data-mining regarding the choice of the break date (Maddala and Kim 2003).

Zivot and Andrews (1992), Perron and Vogelsang (1992), and Perron (1997) have developed unit root test methods that include one unknown structural break.

Zivot and Andrews (1992) models are as follows:

Model with Intercept

$$y_t = \mu + \theta DU_t(\lambda) + \beta t + \alpha y_{t-1} + \sum_{j=1}^k c_j \Delta y_{t-j} + e_t \quad 5.9$$

Model with Trend

$$y_t = \mu + \beta t + \gamma DT_t^*(\lambda) + \alpha y_{t-1} + \sum_{j=1}^k c_j \Delta y_{t-j} + e_t \quad 5.10$$

Model with Both Intercept and Trend

$$y_t = \mu + \theta DU_t(\lambda) + \beta t + \gamma DT_t^*(\lambda) + \alpha y_{t-1} + \sum_{j=1}^k c_j \Delta y_{t-j} + e_t \quad 5.11$$

Where $DU_t(\lambda) = 1$ if $t > T\lambda$, 0 otherwise;

$$DT_t^*(\lambda) = t - T\lambda \text{ if } t > T\lambda, \text{ 0 otherwise.}$$

The above models are based on the Perron (1989) models. However, these modified models do not include DT_b . On the other hand, Perron and Vogelsang (1992) include DT_b , but exclude t in their models. The Perron and Vogelsang (1992) models are given below:

Innovational Outlier Model (IOM)

$$y_t = \mu + \delta DU_t + \theta D(T_b)_t + \alpha y_{t-1} + \sum_{i=1}^k c_i \Delta y_{t-i} + e_t \quad 5.12$$

Additive Outlier Model (AOM)– Two Steps

$$y_t = \mu + \delta DU_t + \tilde{y}_t \quad 5.13$$

and

$$\tilde{y}_t = \sum_{i=0}^k w_i D(T_b)_{t-i} + \alpha \tilde{y}_{t-1} + \sum_{i=1}^k c_i \Delta \tilde{y}_{t-i} + e_t \quad 5.14$$

\tilde{y} is derived after removing an estimate of the deterministic part of the time series y (Perron and Vogelsang 1992, p.304).

Perron (1997) includes both t (time trend) and DT_b (time at which structural change occurs) in his Innovational Outlier (IO1 and IO2) and Additive Outlier (AO) models.

Innovational Outlier Model allowing one time change in intercept only (IO1):

$$y_t = \mu + \theta DU_t + \beta t + \delta D(T_b)_t + \alpha y_{t-1} + \sum_{i=1}^k c_i \Delta y_{t-i} + e_t \quad 5.15$$

Innovational Outlier Model allowing one time change in both intercept and slope (IO2):

$$y_t = \mu + \theta DU_t + \beta t + \gamma DT_t + \delta D(T_b)_t + \alpha y_{t-1} + \sum_{i=1}^k c_i \Delta y_{t-i} + e_t \quad 5.16$$

Additive Outlier Model allowing one time change in slope (AO):

$$y_t = \mu + \beta t + \delta DT_t^* + \tilde{y}_t \quad 5.17$$

where $DT_t^* = 1(t > T_b)(t - T_b)$

$$\tilde{y}_t = \alpha \tilde{y}_{t-1} + \sum_{i=1}^k c_i \Delta \tilde{y}_{t-i} + e_t \quad 5.18$$

The above Innovational Outlier models represent the change occurring gradually, whereas the Additive Outlier model represents the change occurring rapidly.

More recently, some new methods have been proposed for unit root test with multiple structural breaks (Lumsdaine and Papell 1997; Bai and Perron 2003).

5.3 Sequential Test Procedure

It is clear from the above discussion that there are several methods for the unit root test. In this study, the methods allowing one unknown structural break are employed. It is assumed that excluding the information on the additional break would not affect the result that much as the methods allowing one unknown structural break are designed to pick up the most significant break. Moreover, in the case of employing multiple structural breaks too, certain restrictions regarding the number of breaks has to be imposed, like selecting 2, 3 or 4 breaks and abandoning the rest.

There are quite a few softwares featuring various unit root tests. These include Shazam, Microfit, EViews, RATS, and others. The results given by different softwares and different test methods are dissimilar and in some cases contradictory. For some time-series one method may return a reliable and realistic result; but it may not be the case for other time series.

Different models are given for the time series with intercept only, with trend only, and with both. Similarly, different models are prescribed for the time series with structural break and with time trend. In such a case, certain judgement based on economic theory has to be applied in order to make assumptions about the nature of the time series. But such assumptions may not be true always and may lead to misspecification and totally wrong inferences. For these reasons, one faces the problem of selecting an appropriate method of test.

Economic fundamentals and available information cannot be ignored while using the test results given by a particular test method. Different types of test methods or models may be appropriate for different time series in order to get the results consistent with economic theories. In such a case, sticking to only one method for all the time series could be inappropriate. This is more so in the case of dealing with a large number of time series in a single research.

Against the above background, a sequential procedure based on the general to specific approach has been developed and employed in this study in order to select suitable models for the unit root test. The procedure is as follows:

1. Run Perron (1997): Innovational Outlier Model (IO2)

As mentioned earlier, this model includes t (time trend) and DT_b (time of structural break), and both intercept (DU) and slope (DT).

- Check t and DT_b statistics.
- If both t and DT_b are significant, check DU and DT statistics.
- If both DU and DT are significant, select this model.
- If only DU is significant, go to Perron (1997): *IO1* model.

This model includes t (time trend) and DT_b (time of structural break), and DU (intercept) only.

- If only DT is significant, go to Perron (1997): Additive Outlier model (*AO*)
- This model includes t (time trend) and DT_b (time of structural break), and slope (DT) only.*

In some cases, t and DT_b may be insignificant in *IO2* but significant in *IO1* or *AO*. Therefore, *IO1* and *AO* tests should be conducted after *IO2* in order to check the existence of such condition.

2. If only t is significant in 1 above, go to Zivot and Andrews (1992) models:

Zivot and Andrews (1992) models include t but exclude DT_b .

- Run Zivot and Andrews test with intercept, trend and both separately, and then compare the results. Select the model that gives the results consistent with the economic fundamentals and the available information.

3. If only DT_b is significant in above 1, go to Perron and Vogelsang (1992) models:

Perron and Vogelsang (1992) models include DT_b , but exclude t .

- Run *IOM* and *AOM*. Compare the statistics and select the appropriate model.

4. If both t and DT_b are not significant in 1, then run ADF (without structural break).

The main reasoning behind employing the above sequential procedure is that the inclusion of irrelevant information and the exclusion of relevant information may lead to misspecification of the model. For example, the Perron 1997 – *IO2* model includes t , DT_b , DU and DT . If the test results of a time series show that the DT is not relevant or significant, then using this model (*IO2*) for that time series involves the risk of the misspecification, because the irrelevant information (DT) is included in the model. In this case, the model that includes t , DT_b and DU , but excludes DT should be preferred. This means that Perron 1997-*IO1* model may be appropriate for this time series. On the other hand, if the Perron 1997-*IO1* model is employed for a time series, which has significant t , DT_b , DU and DT , misspecification may occur because the Perron 1997-*IO1* model excludes DT from the model.

Following the procedure outlined above, a set of mixed methods is selected for the unit root test in this study. The results given by this set of mixed methods are more realistic and consistent with the economic fundamentals and known facts. These results are presented in the following section.

5.4 Unit Root Test Statistics

The summary test statistics given by various unit root test models are presented in Table 5.1 to 5.5 below. The results are compared in Table 5.6 and Table 5.7, and the list of selected models for each time series and their results are presented in Table 5.8.

Table 5.1 **Perron 1997 - IO2 Model Results**

	<i>Variables</i>	T_b	k	t	DT_b	DU	DT	$T_\alpha = 1$	<i>Result</i>
1	FLI	1992:03	4	*			*	-4.4619	<i>N</i>
2	LVBT	1975 01	12	*			*	-3.2692	<i>N</i>
3	LGDP _r	1978 04	12		*		*	-5.3723 *	<i>S</i>
4	IRR/DRR	1979 03	11					-6.1978 *	<i>S</i>
5	LPBB	1976 01	11					-3.2706	<i>N</i>
6	LTD _r	1975 02	12	*			*	-5.6118 *	<i>S</i>
7	LTBC _r	1989 03	12	*			*	-3.6944	<i>N</i>
8	LR _r	1979 03	11					-7.1149 *	<i>S</i>
9	RF _r	1979 03	11					-7.0035 *	<i>S</i>
10	BCB _r	1988 03	4					-4.7839	<i>N</i>
11	LGDP _P	1978 04	12	*	*		*	-5.2232 *	<i>S</i>
12	LFD	1975 02	10	*	*			-6.0476 *	<i>S</i>
13	LNGDP _r	1993 01	9	*				-3.9371	<i>N</i>
14	LVBTP	1975 01	12	*	*			-3.3199	<i>N</i>
15	LSNGDP	1999 02	10	*				-3.6252	<i>N</i>
16	LSBCP	1987 02	4					-4.3645	<i>N</i>
17	LPBCIA	1987 04	9	*				-5.1157 *	<i>S</i>
18	LSBCPP	1991 03	8				*	-3.1773	<i>N</i>
19	LCD _r	1975 02	12	*			*	-4.9432	<i>N</i>

S = Stationary, *N* = Non-stationary

* Significant at 5% level (in the case of t , DT_b , DU , and DT , coefficient close to zero, and T -statistics significant at 5% level)

Critical value for $T_\alpha = 1$ at 5% is -5.08

The above unit root test results given by the Perron 1997- IO2 model suggest that out of the total 19 variables, 8 are stationary and the rest 11 are non-stationary series. However, the given statistics of t , DT_b , DU and DT are not significant for any of the series. It should be noted that the term 'significant' here means two different things.

In the case of $T_\alpha=1$, the T-statistics greater than the critical value of the given level is considered to be significant and this indicates that the time series is stationary. In the case of t , DT_b , DU and DT , the coefficient close to zero and their T-statistics significant at the 5 per cent level is considered to be significant, since the null hypothesis is that these values equal zero.

In other words, if the value of t , DT_b , DU and DT are close to zero, but the T-statistics are not significant, then these results are not meaningful. Similarly, if these values are not close to zero, but the T-statistics are significant, then the significance of the T-statistics only has no meaning, because the required values are not close to zero. Therefore, the value of t , DT_b , DU and DT close to zero and their T-statistics significant at a given level at the same time is a required condition for these values to become significant. From the results of the above table, it can be inferred that this model is not relevant for any of the time series considered in this study.

Table 5.2 **Perron 1997 – IOI Model Results**

	<i>Variables</i>	T_b	k	t	DT_b	DU	$T_\alpha = 1$	<i>Result</i>
1	FLI	1992:03	8	*			-4.3893	<i>N</i>
2	LVBT	1986 02	12	*		*	-3.7463	<i>N</i>
3	LGDP _r	1973 04	12	*	*	*	-3.7238	<i>N</i>
4	IRR/DRR	1975 02	11				-4.9801*	<i>S</i>
5	LPBB	1976 01	11	*		*	-3.3511	<i>N</i>
6	LTD _r	1975 02	12	*			-5.1961*	<i>S</i>
7	LTBC _r	1986 02	12	*		*	-4.0601	<i>N</i>
8	LR _r	1979 03	11				-5.3826*	<i>S</i>
9	RFR	1975 02	11				-5.3241*	<i>S</i>
10	BCB _r	1989 02	4				-4.7437	<i>N</i>
11	LGDP _P	1973 04	12	*	*	*	-3.6742	<i>N</i>
12	LFD	1975 02	10	*			-5.9357*	<i>S</i>
13	LNGDP _r	1992 04	9	*	*	*	-4.1086	<i>N</i>
14	LVBT _P	1986 02	12	*		*	-3.7547	<i>N</i>
15	LSNGDP	1992 01	10	*			-3.5597	<i>N</i>
16	LSBCP	1992 03	4				-4.7649	<i>N</i>
17	LPBCIA	1987 04	9	*			-5.1304*	<i>S</i>
18	LSBCPP	1987 04	8	*			-3.3505	<i>N</i>
19	LCD _r	1995 03	12	*			-4.8425	<i>N</i>

S = Stationary, *N* = Non-stationary

* Significant at 5% level (in the case of t , DT_b , and DU , coefficient close to zero and T-statistics significant at 5% level)

Critical value for $T_\alpha = 1$ at 5% is -4.80

The results of the Perron 1997 – IO1 model presented in Table 5.2 above show that among the time series considered in this study, 6 are stationary series and the rest of the series (13) have unit roots. However, all of the parameters (*viz*, t , DTb , and DU) are significant only for LGDPr, LGDPP and LNGDPr. This fact indicates that Perron 1997 – IO1 model is suitable for these three time series.

Table 5.3 Perron 1997 – AO Model Results

	<i>Variables</i>	T_b	k	t	DT	$T_\alpha = 1$	<i>Result</i>
1	FLI	1978 04	8	*	*	-2.5766	<i>N</i>
2	LVBT	1973.01	12		*	-3.1282	<i>N</i>
3	LGDPr	1978 03	9	*	*	-3.0812	<i>N</i>
4	IRR/DRR	1975 02	11			-4.3553	<i>N</i>
5	LPBB	1985 03	12	*	*	-3.4495	<i>N</i>
6	LTD _r	1980 04	5	*	*	-3.9549	<i>N</i>
7	LTBC _r	1995 02	12	*	*	-2.8173	<i>N</i>
8	LR _r	1986 01	8			-3.5980	<i>N</i>
9	RFr	1975 04	11			-4.6859*	<i>S</i>
10	BCBr	1980 02	4			-4.3553	<i>N</i>
11	LGDPP	1978 02	12	*	*	-3.0888	<i>N</i>
12	LFD	1973 01	10			-2.9105	<i>N</i>
13	LNGDPr	1999 01	9	*	*	-3.1655	<i>N</i>
14	LVBTP	1973 01	12		*	-3.1947	<i>N</i>
15	LSNGDP	1997 03	9	*	*	-3.1911	<i>N</i>
16	LSBCP	1982 02	4			-4.0418	<i>N</i>
17	LPBCIA	1988 02	12	*		-3.4176	<i>N</i>
18	LSBCPP	1991 03	8	*	*	-3.2040	<i>N</i>
19	LCD _r	1990 01	12	*	*	-4.3822	<i>N</i>

S = Stationary, *N* = Non-stationary

* Significant at 5% level (in the case of t and DT , coefficient close to zero and T -statistics significant at 5% level)

Critical value for $T_\alpha = 1$ at 5% is -4.65

The Perron 1997-AO model statistics reported in the above table show that out of the total 19 time series, only one time series (RFr) is stationary, and all the rest are non-stationary. When compared with the Perron 1997-IO2 and IO1 model, this (AO) model seems to be inclined toward non-rejecting the unit root in the time series. It should be noted that the IO2 and the IO1 models are innovational outlier models that are associated with a gradual change in the time series, while the AO model is an additive outlier model that shows a rapid change.

In the above table, the values of t and DT are found to be significant for more than half of the time series. These series include FLI, LGDPr, LPBB, LTDr, LTBCr, LGDPP, LNGDPr, LSNGDP, LSBCPP, and LCDr. This result suggests that the Perron 1997-AO model is suitable for these ten time series.

Table 5.4 **Zivot and Andrews 1992 Model Results**
(With both intercept and slope)

	<i>Variables</i>	T_b	k	t	$T_\alpha = 1$	<i>Result</i>
1	FLI	1993 01	0	*	-4.2687	<i>N</i>
2	LVBT	1982 03	2	*	-2.4992	<i>N</i>
3	LGDPr	1979 02	1	*	-4.4348	<i>N</i>
4	IRR/DRR	1975 05	3		-7.1772 *	<i>S</i>
5	LPBB	1999 01	0	*	-6.1179 *	<i>S</i>
6	LTDr	1999 01	1	*	-6.1179 *	<i>S</i>
7	LTBCr	1982 03	3	*	-3.5249	<i>N</i>
8	LRr	1975 04	3	*	-6.8249 *	<i>S</i>
9	RFr	1975 04	3		-7.1562 *	<i>S</i>
10	BCBr	1999 01	2		-6.0885 *	<i>S</i>
11	LGDPP	1999 01	1	*	-6.0885 *	<i>S</i>
12	LFD	1999 01	0		-6.0885 *	<i>S</i>
13	LNGDPr	1988 04	1	*	-6.2195	<i>S</i>
14	LVBTP	1999 01	2	*	-6.0885 *	<i>S</i>
15	LSNGDP	1988 04	1	*	-5.6607 *	<i>S</i>
16	LSBCP	1984 03	1	*	-6.0695 *	<i>S</i>
17	LPBCIA	1983 04	2		-4.8676	<i>N</i>
18	LSBCPP	1988 02	0		-3.3875	<i>N</i>
19	LCDr	1976 02	3		-3.9856	<i>N</i>

S = Stationary, *N* = Non-stationary

* Significant at 5% level (in the case of t , coefficient close to zero and T -statistics significant at 5% level)

Critical value for $T_\alpha = 1$ at 5% is -5.08

The test statistics given by the Zivot and Andrews 1992 model (with both intercept and slope) is presented in Table 5.4 above. The statistics suggest that t is significant for the 12 time series, but not significant for the rest series. Based on the significance of t , it can be argued that this model might be suitable for the 12 time series, viz FLI, LVBT, LGDPr, LPBB, LTDr, LRr, LGDPP, LNGDPr, LVBTP, LSNGDP and LSBCP.

Table 5.5 Perron and Vogelsang 1992 Model Results
(Innovational Outlier Model)

	<i>Variables</i>	T_b	k	DT_b	DU	T_α	<i>Result</i>
1	FLI	1994 01	8			-2.7722	<i>N</i>
2	LVBT	1978 04	12		*	-1.1197	<i>N</i>
3	LGDPr	1974 01	12	*	*	-1.2295	<i>N</i>
4	IRR/DRR	1979 04	12			-2.1313	<i>N</i>
5	LPBB	1976 01	4		*	-3.3530	<i>N</i>
6	LTDrr	1973 03	1		*	-1.3702	<i>N</i>
7	LTBCr	1981 04	10		*	-1.6410	<i>N</i>
8	LRr	2002 03	12			-2.2272	<i>N</i>
9	RFr	2002 03	8			-3.1374	<i>N</i>
10	BCBr	1989 02	4			-4.3252 *	<i>S</i>
11	LGDPP	1974 01	12	*	*	-0.6777	<i>N</i>
12	LFD	1979 01	11			-1.2990	<i>N</i>
13	LNGDPr	1994 01	9			-0.5056	<i>N</i>
14	LVBTPr	1978 04	12		*	-0.9974	<i>N</i>
15	LSNGDP	1994 01	9			-0.5214	<i>N</i>
16	LSBCPr	1989 02	11		*	-3.4023	<i>N</i>
17	LPBCIA	1984 04	9		*	-0.5254	<i>N</i>
18	LSBCPP	1999 04	8			-2.6722	<i>N</i>
19	LCDrr	1975 03	12			-2.2702	<i>N</i>

S = Stationary, *N* = Non-stationary

Critical value for $T_\alpha = 1$ at 5% is -4.19

* Significant at 5% level (in the case of DT_b , coefficient close to zero and *T*-statistics significant at 5% level)

As mentioned earlier, the Perron and Vogelsang model includes DT_b and DU . It can be seen in Table 5.5 above that both the DT_b and DU are significant only for LGDPr and LGDPP. This shows that the model is suitable only for these two series. Regarding the stationarity of the time series, this model shows that only one time series in the group of 19 is stationary and all the rest are non-stationary. This result is identical with the Perron 1997 –AO model regarding the number of stationary and non-stationary time series. However, these models differ regarding the stationary time series because the Perron 1997-AO model finds RFr to be stationary, while Perron and Vogelsang model finds BCBr to be stationary.

Table 5.6 Unit Root Test Result Comparison

	<i>Series</i>	<i>Perron 1997</i>			<i>Zivot & Andrews Both</i>	<i>Perron & Vogelsang IOM</i>	<i>Result</i>
		IO2	IO1	AO			
1	FLI	<i>N</i>	<i>N</i>	<i>N*</i>	<i>N*</i>	<i>N</i>	<i>N</i>
2	LVBT	<i>N</i>	<i>N</i>	<i>N</i>	<i>N*</i>	<i>N</i>	<i>N</i>
3	LGDP _r	<i>S</i>	<i>N*</i>	<i>N*</i>	<i>N*</i>	<i>N*</i>	<i>N</i>
4	IRR/DRR	<i>S</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
5	LPBB	<i>N</i>	<i>N</i>	<i>N*</i>	<i>S*</i>	<i>N</i>	<i>N</i>
6	LTD _r	<i>S</i>	<i>S</i>	<i>N*</i>	<i>S*</i>	<i>N</i>	<i>N</i>
7	LTBC _r	<i>N</i>	<i>N</i>	<i>N*</i>	<i>N*</i>	<i>N</i>	<i>N</i>
8	LR _r	<i>S</i>	<i>S</i>	<i>N</i>	<i>S*</i>	<i>N</i>	<i>S</i>
9	RFR	<i>S</i>	<i>S</i>	<i>S</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	BCBr	<i>N</i>	<i>N</i>	<i>N</i>	<i>S</i>	<i>S</i>	<i>N</i>
11	LGDP _P	<i>S</i>	<i>N*</i>	<i>N*</i>	<i>S*</i>	<i>N*</i>	<i>N</i>
12	LFD	<i>S</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
13	LNGDP _r	<i>N</i>	<i>N*</i>	<i>N*</i>	<i>S*</i>	<i>N</i>	<i>N</i>
14	LVBT _P	<i>N</i>	<i>N</i>	<i>N</i>	<i>S*</i>	<i>N</i>	<i>N</i>
15	LSNGDP	<i>N</i>	<i>N</i>	<i>N*</i>	<i>S*</i>	<i>N</i>	<i>N</i>
16	LSBCP	<i>N</i>	<i>N</i>	<i>N</i>	<i>S*</i>	<i>N</i>	<i>S</i>
17	LPBCIA	<i>S</i>	<i>S</i>	<i>N</i>	<i>N</i>	<i>N</i>	<i>N</i>
18	LSBCPP	<i>N</i>	<i>N</i>	<i>N*</i>	<i>N</i>	<i>N</i>	<i>N</i>
19	LCD _r	<i>N</i>	<i>N</i>	<i>N*</i>	<i>N</i>	<i>N</i>	<i>N</i>

S = Stationary, *N* = Non-stationary, * = Significant

Table 5.7 Unit Root Test Summary Result

	<i>Perron 1997</i>			<i>Zivot & Andrews Both</i>	<i>Perron & Vogelsang IOM</i>
	IO2	IO1	AO		
Stationary Series	8	6	1	7	1
Non-stationary Series	11	13	18	12	18
Total	19	19	19	19	19

The results given by various models are compared in Table 5.6 and 5.7. It can be seen from Table 5.6 that there is a unanimous result for only the five time series, which are FLI, LVBT, LTBC_r, LSBCPP and LCD_r. All the models considered in this study find these five time series to be non-stationary. On the other hand, Table 5.7 suggests that Perron 1997- AO, and Perron and Vogelsang models are inclined to not rejecting

the unit root hypothesis, whereas such inclination of Perron 1997–IO1, IO2 and Zivot and Andrews models are almost the same.

Regarding the power of test, the Perron and Vogelsang 1992 model is robust. The testing power of Perron 1997 models and Zivot and Andrews models are almost the same (Wilson 2004). Therefore, wherever relevant, the Perron and Vogelsang 1992 model is preferred to the other models. Among Perron 1997, and Zivot and Andrews 1992 models, the Perron 1997 model is selected, as this model is more comprehensive.

Table 5.8 Selected Models and Results

<i>S.N.</i>	<i>Series</i>	<i>Selected Model</i>	T_b	$T_\alpha = 1$	<i>Result</i>
1	FLI	Zivot and Andrews	1993 01	-4.2627	<i>N</i>
2	LVBT	Zivot and Andrews	1982 03	-2.4992	<i>N</i>
3	LGDP _r	Perron and Vogelsang	1974 01	-1.2295	<i>N</i>
4	IRR/DRR	Perron IO2	1979 03	-6.1978 *	<i>S</i>
5	LPBB	Perron AO	1985 03	-3.4495	<i>N</i>
6	LTD _r	Perron AO	1980 04	-3.9549	<i>N</i>
7	LTBC _r	Perron AO	1995 02	-2.8173	<i>N</i>
8	LR _r	Zivot and Andrews	1975 04	-6.8249 *	<i>S</i>
9	RFR	Perron IO2	1979 03	-7.0035 *	<i>S</i>
10	BCBr	Perron IO2	1988 03	-4.7839	<i>N</i>
11	LGDP _P	Perron and Vogelsang	1974 01	-0.6777	<i>N</i>
12	LFD	Perron IO2	1975 02	-6.0476 *	<i>S</i>
13	LNGDP _r	Perron AO	1999 01	-3.1655	<i>N</i>
14	LVBT _P	Zivot and Andrews	1999 01	-6.0885 *	<i>S</i>
15	LSNGDP	Perron AO	1997 03	-3.1911	<i>N</i>
16	LSBCP	Zivot and Andrews	1984 03	-6.0695 *	<i>S</i>
17	LPBCIA	Perron IO2	1987 04	-5.1157 *	<i>S</i>
18	LSBCPP	Perron AO	1991 03	-3.2040	<i>N</i>
19	LCD _r	Perron AO	1990 01	-4.3822	<i>N</i>

S = Stationary, N = Non-stationary

Critical values at 5% level:

Perron IO2 = -5.08

Perron IO1 = -4.80

Perron AO = -4.83

Zivot and Andrews = -5.08

Perron and Vogelsang = -4.19

The unit root test conducted applying a set of different test methods - results presented in Table 5.8 above, show that out of the total 19 time series considered in this study, 12 are non-stationary and the rest (7) are stationary. Regarding the reported

structural break date, the 8 time series underwent the structural break during pre-liberalisation era (1970 – 1983), whereas the 11 time series underwent the structural break during the post-liberalisation era (1984 – 2003). Although the structural break date is statistically very important in the unit root test, it does not have a direct economic meaning. The only inference that can be made from the above test results is that the change in the economic sphere of the country has been higher during the post liberalisation era than that during the pre-liberalisation era.

Chapter 6

COINTEGRATION AND CAUSALITY TEST

As stated earlier, the main objective of this study is to analyse the impact of financial liberalisation on various aspects of the Nepalese economy. To this end, the study of the relationships among relevant time series is essential in portraying the true picture of this impact. This chapter is dedicated to investigating the relationship among various time series related to the Nepalese financial system and the national economy. The investigation follows the methodological framework developed in Chapter 4 and Chapter 5, and the main focus is on the long-term relationship.

The first section of this chapter discusses the concept of cointegration and the reasons for employing the autoregressive distributed lag (ARDL) modelling approach of cointegration, as is used in this study. The test statistics of the ARDL model are presented and interpreted in Section 2 through Section 9. Finally, the concept of the causality test is discussed and the empirical test results are presented in Section 10.

6.1 Cointegration and ARDL Approach

The concept of cointegration is associated with the long-run equilibrium relationship between two or more variables. The economic interpretation of cointegration is that if two or more variables are linked to form an equilibrium relationship spanning the long run, even though the series themselves in the short run may deviate from the equilibrium, they will move closer together in the long run equilibrium (Harris and Sollis 2003, p.34.).

There are several methods available for conducting the cointegration test. The most widely used methods include the residual based Engle-Granger (1987) test, and maximum likelihood based Johansen (1991; 1995) and Johansen-Juselius (1990) test. Due to the low power and other problems associated with these test methods, the OLS

based autoregressive distributed lag (ARDL) approach to cointegration has become popular in recent years¹.

The ARDL modelling approach pioneered by Charemza and Deadman (1992), Pesaran and Pesaran (1997), Pesaran and Smith (1998), and Pesaran and Shin (1999) has numerous advantages. The main advantage of this approach lies in the fact that it can be applied irrespective of whether the regressors are I(0) or I(1) (Pesaran and Pesaran 1997, pp. 302-303). Another advantage of this approach is that the model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modelling framework (Laurenceson and Chai 2003, p.28). Moreover, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation (Banerjee *et al.* 1993, p.51). The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information. It is also argued that using the ARDL approach avoids problems resulting from nonstationary time series data (Laurenceson and Chai 2003, p.28).

In Chapter 5, it has been shown that the time series considered in this study are a mix of the I(0) and I(1) series. The cointegration test methods based on Johansen (1991; 1995) and the Johansen-Juselius (1990) require that all the variables in the equation be of equal degree of integration, i.e. I(1). Therefore, these methods of cointegration cannot be employed in this study. Moreover, it has also been illustrated in Chapter 5 that a slight change in assumptions or specification may affect the result of the unit root test greatly, and as a consequence, a stationary time series may be found to be a nonstationary series and vice versa. For these reasons, even the stationarity of the time series are ascertained by the unit root test, and found that all of the variables to be nonstationary, there still remains some risk of misspecification. Therefore, the ARDL modelling approach of cointegration is employed in this study.

To illustrate the ARDL modelling approach, the following simple model is considered here:

$$y_t = \alpha + \beta x_t + \delta z_t + e_t \quad (6.1)$$

¹ A number of recent studies employ the ARDL modelling approach to cointegration instead of the cointegration test methods based on Johansen (1991; 1995) and Johansen-Juselius (1990). Some of the examples are: Ghatak and Siddiki (2001), Atkins and Coe (2002), Laurenceson and Chai (2003), Morley (2003), Bahamani-Oskooee and Nasir (2004), Oxley *et al.* (2004), and Wilson and Chaudhri (2004).

where y_t , x_t and z_t are three different time series; e_t is a vector of stochastic error terms; and α and β are the parameters. For the above equation, the error correction version of the ARDL model is given by:

$$\Delta y_t = \alpha_0 + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \sum_{i=1}^p \delta_i \Delta x_{t-i} + \sum_{i=1}^p \varepsilon_i \Delta z_{t-i} + \lambda_1 y_{t-1} + \lambda_2 x_{t-1} + \lambda_3 z_{t-1} + u_t \quad (6.2)$$

The null hypothesis in (6.2) is $\lambda_1 = \lambda_2 = \lambda_3 = 0$, which means the non-existence of the long run relationship.

The ARDL method estimates $(p+1)^k$ number of regressions in order to obtain optimal lag length for each variable, where p is the maximum number of lag to be used and k is the number of variables in the equation. As the data used in this study are in a quarterly frequency, 4 is selected as the maximum lag (p) to be used, following Pesaran and Pesaran (1997). The model can be selected using the model selection criteria like Schwartz-Bayesian Criteria (SBC) and Akaike's Information Criteria (AIC). SBC is known as the parsimonious model: selecting the smallest possible lag length, whereas AIC is known for selecting the maximum relevant lag length. In this study, the model is selected based on the prediction power of the model. For this, two separate models are selected based on SBC and AIC criteria. The prediction errors of these models are compared using the last 4 observations in the series, and the model with the higher prediction power is selected.

To ascertain the appropriateness of the ARDL model, the diagnostic test and the stability test are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedasticity associated with the model. The stability test employs the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ), and examines the structural stability of the model. The statistics of the diagnostics test and stability test along with some key regression statistics (R^2 , Durbin-Watson and F) of the ARDL models employed in Section 6.2 through 6.9 are furnished in Appendix C.

The high value of R^2 for all of the ARDL models show that the overall goodness of fit of these models is extremely high. The F-statistics measuring the joint significance of all regressors in the model are statistically significant at the 1 per cent level for all of the models. Similarly, the Durbin-Watson statistics for all of the models are more than or close to 2.

The diagnostic test results (presented in Appendix C) show that most of the models pass the tests for functional form and normality. However, the results indicate that there exist serial correlation and heteroscedasticity in most of the models. The ARDL model has been shown to be robust against residual autocorrelation. Therefore, the presence of autocorrelation does not affect the estimates (Laurenceson and Chai 2003, p.30). Since the time series analysed in this study are of mixed order of integration, i.e., $I(0)$ and $I(1)$, it is natural to detect heteroscedasticity.

The stability test results (CUSUM and CUSUMSQ) plotted against the critical bound of 5 per cent significance level show that all of the models in general are stable over time.

6.2 Financial Sector Widening

As discussed in Chapter 4.4, one of the expected outcomes of the financial liberalisation is a widening of the financial sector. The degree of the financial sector widening is reflected in the volume of bank transactions (VBT). Therefore, in order to analyse the impact of financial liberalisation on financial sector widening, a ARDL test is conducted on the following modified version of equation (4.5):

$$LVBT_t = \alpha_0 + \alpha_1 LGDPR_t + \alpha_2 IRR_t + \alpha_3 LPBB_t + \alpha_4 FLI_t + \alpha_5 D_{LVBT_t} + e_t \quad (6.3)$$

The unit root test in Chapter 5 has shown that the log of the real total volume of bank transaction (LVBT), the log of the real gross domestic product (LGDPR), the log of the average population density per bank branch (LPBB) and the financial liberalisation index (FLI) are nonstationary series, while real interest rate (IRR) is a stationary series. Regressand LVBT goes through a structural break in 1982:03. The data shows that the real total volume of bank transactions grew from Rs.33,933 million in 1982:02 to Rs.34,584 million in 1982:03 recording an increase of 2 per cent. As the exclusion of structural break makes the testing power of the model low, a dummy (D_{LVBT}) for the structural break on LVBT has been included in the above equation, which takes a value of 0 until 1982:03 and value of 1 from 1982:04 onwards.²

Total number of regressions estimated in (6.3) is $(4+1)^5 = 3125$. The dummy (D_{LVBT}) is included in the regression for the completeness of the information but it is not

² Harvey, Leybourne and Newbold (2001) show that more power is achieved by choosing the break date as $Tb+1$ rather than Tb .

included in the main model. The model selected by SBC and AIC are (3,0,0,0,0)³ and (3,1,3,3,1), respectively. The SBC model is found to have a better prediction power over the AIC model⁴. The SBC model results are presented in Table 6.1 and Table 6.2 below.

Table 6.1 **ARDL (3,0,0,0,0) Model Long Run Results**

Dependent Variable: LVBT

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	16.2975	16.2215	1.0047
LGDPR	0.2376	1.5636	0.1519
IRR	0.0007	0.0117	0.0557
LPBB	-0.6749	0.3370	-2.0029**
FLI	1.0433	0.7166	1.4558
D _{LVBT}	-0.8531	0.3259	-2.6179**

** Significant at 5% level

The test statistics in Table 6.1 show that the coefficient of LGDPR, IRR and FLI are positive, but statistically not significant at the 5 per cent level. This implies that there is no significant long run impact of LGDPR, IRR and FLI on LVBT. The coefficient of LPBB is statistically significant at the 5 per cent level, and the sign of the coefficient is as expected. There is a negative association between LPBB and LVBT, suggesting that a decrease in average population density per bank branch leads to an increase in the total volume of bank transactions. The underlying rationale is that the average population density per bank decreases when the number of bank branches increases. Therefore, among various measures of financial liberalisation, the elimination of entry barriers has a significant impact on the total volume of bank transactions. The above result reveals that on average a 1 unit decrease in LPBB is associated with an increase of Rs. 674.9 thousand in LVBT.

Table 6.2 shows that the error correction model (ECM_{t-1}) associated with the ARDL (3,0,0,0,0) model is statistically significant at the 5 per cent level. This significance also confirms the long run cointegrating relationship between variables. The coefficient of the ECM_{t-1} is -0.0363, which suggests a slow speed of adjustment back to the long run equilibrium after a short run shock. About 4 percent of the disequilibria in the previous quarter are corrected in the current quarter. ECM_{t-1} also

³ The numbers in the parentheses separated by commas denote the selected optimal number of lag for each variable in the equation, excluding the dummy variable.

⁴ The prediction mean-error of the SBC model is - 0.0017 and that of the AIC model is -0.0052.

shows that a change in FLI (ΔFLI) is associated with the change in LVBT ($\Delta LVBT$). This information suggests that although there is no statistically significant long run relationship between the two variables (Table 6.1), a change in the composite index of financial liberalisation has some positive effect on the change in the total volume of bank transactions in the short run.

Table 6.2 **ARDL (3,0,0,0,0) Model ECM Results**

Dependent Variable: $\Delta LVBT$

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	0.5912	0.4456	1.3269
$\Delta LVBT1$	1.0000	0.0717	1.3940
$\Delta LVBT2$	-0.5352	0.0656	-8.1616***
$\Delta LGDPR$	0.0086	0.0600	0.1436
ΔIRR	0.0000	0.0004	0.0557
$\Delta LPBB$	-0.0245	0.0206	-1.1860
ΔFLI	0.0378	0.0150	2.5247**
ΔD_{LVBT}	-0.0310	0.0143	-2.1599**
ECM_{t-1}	-0.0363	0.177	-2.0513**

** Significant at 5% level

*** Significant at 1% level

A change in the total volume of bank transactions is directly associated with the change in the level of saving and investment. The impact of financial liberalisation on saving and investment is studied in the following section.

6.3 Interest Rate, Savings and Investment

One of the main hypotheses of financial liberalisation is that the deregulation of the interest rate would lead to an increase in the real interest rate, which in turn would increase saving and investment. To test this hypothesis, an empirical test is conducted on equation (4.7) and (4.8), with some adjustment for structural break. By including a dummy D_{LTDR} for the structural break in the log of the real time deposits, equation (4.7) can be rewritten as follows:

$$LTDR_t = \alpha_6 + \alpha_7 LGDPR_t + \alpha_8 DRR_t + \alpha_9 LPBB_t + \alpha_{10} FLI_t + \alpha_{11} D_{LTDR_t} + e_t \quad (6.4)$$

In the above equation, the log of the total real time deposits (LTDR), the log of the real gross domestic product (LGDP), the log of the average population density per bank branch (LPBB), and the financial liberalisation index (FLI) are non-stationary, while the real deposit rate (DRR) is stationary (see Chapter 5). The regressand LTDR undergoes a structural break in 1980:04. The data reveals that the total real time deposits at banks jumped to Rs.11,749 million in the fourth quarter of 1980 from Rs.11,221 millions in the previous quarter, registering an increase of 4.7 per cent. Therefore, the dummy D_{LTDR} takes the value of 0 until 1980:04 and 1 from 1981:01 onwards. The ARDL test results for (6.4) are given in Table 6.3 and 6.4.

The long run statistics (Table 6.3) reveals that the real deposit interest rate is the key determinant of the time deposits held by banks. The coefficient of DRR is 0.1020, which is statistically significant at the 5 per cent level. It suggests that in the long run, an increase of one per cent in the real interest rate is associated with an increase of Rs.1.1074 million in the real time deposits⁵. This result contradicts with the findings reported by Bandiera *et al.* (2000), Loayza *et al.* (2000), and Reinhart and Tokatlidis (2001). These studies find no evidence of positive effect of the real interest rate on saving and in most cases they find the effect to be negative.

Table 6.3 ARDL (4,3,4,0,0) Model Long Run Results

Dependent Variable: LTDR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	-10.5308	12.6147	-0.8348
LGDP	1.6860	1.1457	1.4716
DRR	0.1020	0.0452	2.2534**
LPBB	0.2571	0.5998	0.4287
FLI	0.0328	0.4476	0.0733
D_{LTDR}	0.6141	0.3968	1.5473

** Significant at 5% level

The coefficient of LGDP is not statistically significant. However, the coefficient of $\Delta LGDP$ (Table 6.4) is statistically significant at the 5 per cent level.

⁵ LTDR is in the natural log form while DRR is in the level form. An anti-log of the coefficient of DRR, which is 0.1020, is 1.1074.

This implies that although there is no statistically significant long run impact of real income on real saving, a change in the real income is associated with a change in the real saving in the short run. Similarly, a change in the real deposit rate (ΔDRR) has a statistically significant positive effect on the change in real saving (ΔLTDR). However, the change in the lags of DRR, i.e., ΔDRR1 , ΔDRR2 , and ΔDRR3 has a negative impact on the change in real savings.

Table 6.4 **ARDL (4,3,4,0,0) Model ECM Results**

Dependent Variable: ΔLTDR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	-0.3948	0.4868	-0.8109
ΔLTDR1	0.2072	0.0905	2.2904**
ΔLTDR2	-0.2593	0.0916	-2.8304***
ΔLTDR3	0.1204	0.0894	1.3466
ΔLGDP	0.6193	0.3052	2.0292**
ΔLGDP1	-0.1739	0.3299	-0.5271
ΔLGDP2	-0.5260	0.2985	-1.7622*
ΔDRR	0.0020	0.0008	2.6322**
ΔDRR1	-0.0024	0.0008	-2.8545***
ΔDRR2	-0.0023	0.0008	-2.8167***
ΔDRR3	-0.0019	0.0008	-2.3136**
ΔLPBB	0.0096	0.0197	0.4905
ΔFLI	0.0012	0.0166	0.0739
ΔD_{LTDR}	0.0230	0.0134	1.7205
ECM_{t-1}	-0.0375	0.0155	-2.4131**

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

The ECM is statistically significant. It demonstrates that there is a long run relationship between the variables and the adjustment process is slow. The coefficient of -0.0375 suggests that about 4 per cent of the disequilibria of the previous quarter's shock is adjusted back to the long run equilibrium in the current quarter.

Both the long run and ECM results show that population density per bank branch and the composite index of financial liberalisation are not associated with the real time deposits. The overall result demonstrates the positive role played by the real

deposit rate in increasing the real time deposits. This finding clearly supports the first part of the McKinnon-Shaw hypothesis.

The second part of the hypothesis is associated with the positive effect of real interest rate on investment. Investment can be proxied by the total bank credits. In order to analyse this relationship, equation (4.9) is empirically tested after modifying it to include the dummy for structural change in the regressand. The modified equation is as follows:

$$LTBCR_t = \alpha_{12} + \alpha_{13}LTDR_t + \alpha_{14}LRR_t + \alpha_{15}RFR_t + \alpha_{16}BCBR_t + \alpha_{17}FLI_t + \alpha_{18}D_{LTBCR_t} + e_t \quad (6.5)$$

In the above equation, the log of the real total bank credits (LTBCR), the log of the real time deposits (LTDR), the real borrowing from central bank (BCBR), the average population density per bank branch (LPBB) and the financial liberalisation index (FLI) are non-stationary variables, while the real lending rate (LRR) and the real refinance rate (RFR) are stationary variables (see Chapter 5). The unit root test results show that the variable LTBCR undergoes a structural break in 1995:02. In this quarter the real total bank credit increased by 6.8 per cent and reached Rs.41,526 million. To include this structural break, a dummy D_{LTBCR} has been included in the equation that takes a value of 0 until 1995:02 and a value of 1 from 1995:03 onwards.

The SBC selects an ARDL model of (4,1,0,0,0,0) while the AIC selects a model of (4,1,3,2,0,0). The SBC based model is employed here, as the prediction power of this model is superior to that of the AIC based model⁶. The ARDL test results are given in Table 6.5 and Table 6.6.

The long run results given in Table 6.5 shows that real savings is the key determinant of real bank loans. The coefficient of LTDR 0.5561 which is highly significant implies that an increase in the real time deposits by Rs. 1 million would lead to an increase in the real bank lending by Rs.556 thousand. Similarly, borrowing from central bank and the summary measure of financial liberalisation have highly significant positive impact on the real bank lending but the coefficient of the former is infinitesimal. Statistically insignificant coefficient of the real lending rate (LRR) suggests that the lending rate does not determine the volume of bank lending. This can

⁶ The mean prediction error of SBC based and AIC based ARDL models are 0.0014 and – 0.0089, respectively.

happen where there is an extremely high demand for bank loans and the loans are in short supply. Therefore, from the above result, it can be inferred that even after the implementation of financial liberalisation policies, the bank loans are still in short supply in the Nepalese market.

Table 6.5 ARDL (4,1,0,0,0) Model Long Run Results

Dependent Variable: LTBCR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	4.1879	0.8408	4.9811***
LTDR	0.5561	0.0843	6.6003***
LRR	-0.0168	0.0218	-0.7699
RFR	0.0149	0.0204	0.7312
BCBR	0.0002	0.0000	3.6743***
FLI	0.3420	0.1117	3.0624***
D_{LTBCR}	0.3676	0.0823	4.4640***

*** Significant at 1% level

Table 6.6 ARDL (4,1,0,0,0) Model ECM Results

Dependent Variable: Δ LTBCR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	0.7029	0.1114	6.3111***
Δ LTBCR1	0.2955	0.0854	3.4598***
Δ LTBCR2	-0.5593	0.0549	-10.1937***
Δ LTBCR3	0.1655	0.0761	2.1748**
Δ LTDR	-0.3953	0.1321	-2.9922***
Δ LRR	-0.0028	0.0035	-0.8091
Δ RFR	0.0025	0.0033	0.7586
Δ BCBR	0.00003	0.00001	3.3566***
Δ FLI	0.0574	0.0142	4.0302***
ΔD_{LTBCR}	0.0617	0.0190	3.2505
ECM_{t-1}	-0.1678	0.0407	-4.1228***

** Significant at 5% level

*** Significant at 1% level

In Table 6.6, the coefficient of ECM_{t-1} is -0.1678 , which is highly statistically significant. It implies that the disequilibrium occurred due to a shock is totally corrected in six quarters time at a rate of 17 per cent a quarter. The ECM result also shows that a change in borrowing by commercial banks from the central bank (Δ BCBR) and a change in the composite index of financial liberalisation (Δ FLI) are associated with a

positive change in the real bank lending ($\Delta LTBCR$) although such change associated with the former ($\Delta BCBR$) is infinitesimal. However, the coefficient of $\Delta LTDR$ shows that a change in the real time deposits seems to be associated negatively with the change in the real bank lending.

6.4 Economic Growth and Industrial Development

The ultimate goal of financial liberalisation in Nepal is to achieve higher economic growth and industrial development. In order to examine the impact of financial liberalisation on economic growth and industrial development in Nepal, ARDL-based empirical tests are conducted modifying equation (4.11) and (4.13), as developed in Chapter 4.

The regressand of (4.11) is the log of per capita real GDP (LGDPP) that goes through a structural change in 1974:01. The data reveals that the real per capita GDP increased significantly in the fourth quarter of 1974 by registering a quarterly growth of 3.3 per cent. To include this structural break in the form of a dummy (D_{LGDPP}), equation (4.11) is modified as follows:

$$LGDPP_t = \alpha_{19} + \alpha_{20}LFD_t + \alpha_{21}IRR_t + \alpha_{22}FLI_t + \alpha_{23}D_{LGDPP_t} + e_t \quad (6.6)$$

Among the variables included in the above equation, the log of the per capita gross domestic product (LGDPP), the log of the financial depth (LFD), and the financial liberalisation index (FLI) are non-stationary, and the real interest rate (IRR) is stationary. D_{LGDPP} takes a value of 0 until 1974:01 and a value of 1 afterwards.

Both the SBC and the AIC select the same ARDL model, which is (2,0,0,1). The ARDL test results are presented in Table 6.7 and Table 6.8 below.

Table 6.7 ARDL (2,0,0,1) Model Long Run Results

Dependent Variable: LGDPP

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	7.5655	0.1167	64.8550***
LFD	0.0632	0.0923	0.6850
IRR	-0.0027	0.0036	-0.7439
FLI	0.1818	0.0417	4.3660***
D_{LGDPP}	-0.0007	0.0037	-0.1803

*** Significant at 1% level

Table 6.8 ARDL (2,0,0,1) Model ECM Results

Dependent Variable: ΔLGDP

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta \alpha$	0.3115	0.1597	1.9512**
ΔLGDP_1	0.5284	0.0735	7.1922***
ΔLFD	0.0026	0.0036	0.7162
ΔIRR	-0.0001	0.0001	0.7881
ΔFLI	0.0345	0.0105	3.3002***
ΔD_{LGDP}	-0.0007	0.0037	-0.1803
ECM_{t-1}	-0.0412	0.0212	-1.9405*

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

The ARDL results presented in the above tables reveal that the composite index of the financial liberalisation (FLI) is positively associated with per capita real GDP. Both the coefficients of FLI in Table 6.7 and that of ΔFLI in Table 6.8 are statistically significant at the one per cent level. This implies that FLI is associated positively with LGDPP in the long run as well as in the short run. However, LFD and IRR are not associated with LGDPP. The coefficient of ECM_{t-1} is -0.0412 , which narrowly misses the statistical significance of the 5 per cent level. This shows that the adjustment process back to the long run equilibrium after a shock is slow, i.e., 4 per cent a quarter.

The regressand in equation (4.13) is the log of the real non-agricultural gross domestic product (LNGDPR), which has a structural break in 1999:01. In the first quarter of 1999, the real non-agricultural gross domestic product increased by 1.27 per cent and reached Rs. 38,033 million. Among the variables of the equation system, the log of the real non-agricultural gross domestic product (LNGDPR), the log of the real total bank credits (LTBCR) and the financial liberalisation index (FLI) are nonstationary while the real interest rate (IRR) is stationary (see Chapter 5). By including the dummy for the structural break in LNGDPR, equation (4.13) can be rewritten as follows:

$$\text{LNGDPR}_t = \alpha_{24} + \alpha_{25} \text{LTBCR}_t + \alpha_{26} \text{IRR}_t + \alpha_{27} \text{FLI}_t + \alpha_{28} D_{\text{LNGDPR}_t} + e_t \quad (6.7)$$

For testing the above relationship, the SBC selects an ARDL model of (2,3,0,0) while the AIC selects a model of (2,4,2,0). The SBC-based model is employed here as it

has a smaller prediction error compared to that of the AIC based model⁷. The long run and the ECM results of the selected ARDL model are presented in Table 6.9 and Table 6.10, respectively.

Table 6.9 ARDL (2,3,0,0) Model Long Run Results

Dependent Variable: LNGDPR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	6.9867	1.5825	4.4150***
LTBCR	0.2640	0.1722	1.5332
IRR	-0.0072	0.0115	-0.6223
FLI	0.6828	0.1874	3.6432***
D_{LNGDPR}	-0.3718	0.2143	-1.7353*

* Significant at 10% level

*** Significant at 1% level

Table 6.10 ARDL (2,3,0,0) Model ECM Results

Dependent Variable: Δ LNGDPR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	0.3800	0.2067	1.8381*
Δ LNGDPR1	0.4197	0.0954	4.3983***
Δ LTBCR	-0.1584	0.0552	-2.8708***
Δ LTBCR1	-0.0754	0.0486	-1.5534
Δ LTBCR2	-0.1344	0.0535	-2.5118**
Δ IRR	-0.0004	0.0006	-0.6700
Δ FLI	0.0371	0.0224	1.6601*
ΔD_{LNGDPR}	-0.0202	0.0167	-1.2109
ECM_{t-1}	-0.0544	0.0264	-2.0639**

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

The ARDL test results (Table 6.9) suggest that there is a long run relationship between the composite index of financial liberalisation (FLI) and the real non-agricultural GDP (LNGDPR). This relationship is statistically highly significant. The coefficient of FLI, which is 0.6828 states that a unit increase in the composite index of

⁷ The prediction mean error of the SBC based ARDL model is -0.0137, while that of the AIC based ARDL model is -0.0139

the overall financial liberalisation, is associated with an increase of Rs. 1.98 million in real non-agricultural GDP in the long run⁸. In the short run also, a change in FLI is positively associated with a change in LNGDPR, but this relationship is not statistically significant at the 5 per cent level.

The result also reveals that the total bank credit (LTBCR) does not have a long-run relationship with the real non-agricultural gross domestic product (LNGDPR). The ECM results (Table 6.10) show that a change in LTBCR is associated negatively with the change in LNGDPR.

6.5 Financial Deepening

Financial deepening shows the level of financial development in an economy, which is viewed as the catalyst for higher economic growth. In order to examine the impact of financial liberalisation on financial deepening the following relationship is tested:

$$LFD_t = \alpha_{29} + \alpha_{30}LGDPP_t + \alpha_{31}LVBTP_t + \alpha_{32}IRR_t + \alpha_{33}LPBB_t + \alpha_{34}FLI_t + \alpha_{35}D_{LFD_t} + e_t \quad (6.8)$$

The above equation is the modified version of (4.15), and includes a dummy (D_{LFD}) for the structural break in the log of financial depth (LFD). The dummy takes a value of 0 until 1975:02, and a value of 1 from 1975:03 onwards. The log of the financial depth (LFD), the log of the real per capita gross domestic product (LGDPP), the log of the real per capita volume of bank transaction (LVBTP), the log of the average population density per bank branch (LPBB) and the financial liberalisation index (FLI) are nonstationary variables, while the interest rate (IRR) is a stationary variable.

An ARDL model of (4,0,4,0,0,0) is selected by SBC and a model of (4,1,4,3,0,0) is selected by AIC for the above equation. The SBC based model is employed here, as this model has better prediction power over the AIC-based model⁹. The test results are presented in Table 6.11 and 6.12 below.

⁸ LNGDPR is in the natural log form, while FLI is in the level form. The antilog of 0.6828 is 1.9794.

⁹ The prediction mean error of SBC and AIC based models are 0.0025 and 0.0046, respectively.

Table 6.11 ARDL (4,0,4,0,0,0) Model Long Run Results

Dependent Variable: LFD

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	-2.0156	0.7473	-2.6972***
LGDPP	-0.3726	0.4225	-0.8818
LVBTP	0.8212	0.0846	9.7091***
IRR	0.0013	0.0030	0.4149
LPBB	-0.0102	0.1157	-0.0885
FLI	-0.0509	0.0818	-0.6224
D_{LFD}	0.2379	0.1450	1.6407

*** Significant at 1% level

Table 6.11 exhibits that there is a long run relationship between LFD and LVBTP. This relationship is statistically significant at the 1 per cent level. According to Table 6.12, the change in LVBTP and $LVBTP_{t-2}$ also are positively associated with the change in the LFD. But the change in $LVBTP_{t-1}$ and $LVBTP_{t-3}$ are negatively associated with the change in LFD.

Table 6.12 ARDL (4,0,4,0,0,0) Model ECM Results

Dependent Variable: ΔLFD

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	-0.3274	0.1287	-2.5430***
ΔLFD_1	0.2958	0.0803	3.6829***
ΔLFD_2	-0.1718	0.0869	-1.9776**
ΔLFD_3	0.3449	0.0837	4.1214***
$\Delta LGDPP$	-0.0605	0.0763	-0.7937
$\Delta LVBTP$	0.8236	0.0971	8.4829***
$\Delta LVBTP_1$	-0.5693	0.1121	-5.0791***
$\Delta LVBTP_2$	0.5140	0.0959	5.3616***
$\Delta LVBTP_3$	-0.3986	0.1020	-3.9113***
ΔIRR	0.0002	0.0005	0.4220
$\Delta LPBB$	-0.0017	0.0191	-0.0871
ΔFLI	0.0083	0.0133	-0.6236
ΔD_{LFD}	0.0387	0.0183	2.1074**
ECM_{t-1}	-0.1624	0.0456	-3.5598***

** Significant at 5% level

*** Significant at 1% level

Regarding the relationship with other variables, LFD seems not to be statistically significantly associated with LGDPP, IRR, LPBB, and FLI. This finding does not support the hypothesis of financial liberalisation, which specifically states that the real

interest rate is positively associated with financial deepening. This result is consistent with the findings from Demetriades and Luintel (1996). They also do not find any evidence to support the view that the real interest rate is an important determinant of financial development.

The coefficient of ECM_{t-1} is -0.1624 , which is statistically significant at the 1 per cent level (Table 6.12). This result shows that the disequilibria occurred due to a short run shock is corrected at a rate of 16 per cent each quarter following such shock. At this rate it takes more than 6 quarters to come back to the long run equilibrium.

6.6 Resource Allocation

The impact of financial liberalisation can be analysed against the efficiency in resource allocation too. To examine this aspect, following equation has been empirically tested.

$$LSNGDP_t = \alpha_{37} + \alpha_{38}LSBCP_t + \alpha_{39}IRR_t + \alpha_{40}LPBB_t + \alpha_{41}FLI_t + \alpha_{42}D_{LSNGDP_t} + e_t \quad (6.9)$$

This equation is the extended version of equation (4.17). To include the effect of the structural break in $LSNGDP$, a dummy (D_{LSNGDP}) has been included in (6.9). Among the variables in the equation, the log of the share of non-agricultural sector GDP in the total GDP ($LSNGDP$), the log of the share of bank credit to poor population ($LSBCP$), the log of the average population density per bank branch ($LPBB$) and the financial liberalisation index (FLI) are nonstationary variables, while the real interest rate (IRR) is a stationary variable. The dummy D_{LSNGDP} takes in the structural break that occurred in 1997:03.

The SBC-based ARDL model (2,0,1,0,0) is selected for the above equation¹⁰. The ARDL test results are presented in Table 6.13 and Table 6.14 below.

¹⁰ The mean prediction error of SBC and AIC based models are 0.0165 and 0.0172, respectively.

Table 6.13 ARDL (2,0,1,0,0) Model Long Run Results

Dependent Variable: LSNGDP

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	2.1470	0.6866	3.1272***
LSBCP	0.5661	0.4037	1.4024
IRR	0.0038	0.0045	0.8498
LPBB	-0.7382	0.1571	-4.6988***
FLI	0.0866	0.0880	0.9843
D_{LSNGDP}	0.0657	0.0941	0.6978

*** Significant at 1% level

The ARDL result shows that there is a statistically significant long-run relationship between the average population density per bank branch and the share of non-agricultural GDP of the total GDP. This result implies that an increase in the number of bank branches leads to an increase in the share of non-agricultural GDP in the total GDP.

Table 6.14 ARDL (2,0,1,0,0) Model ECM Results

Dependent Variable: Δ LSNGDP

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	0.2595	0.0775	3.3469***
Δ LSNGDP1	0.4890	0.0828	5.9037***
Δ LSBCP	0.0684	0.0457	1.4990
Δ IRR	-0.0024	0.0006	-3.6251***
Δ LPBB	-0.0892	0.0249	-3.5836***
Δ FLI	0.0105	0.0128	0.8203
ΔD_{LSNGDP}	0.0079	0.0108	0.7373
ECM_{t-1}	-0.1209	0.0383	-3.1604***

*** Significant at 1% level

The ECM result shows that also a change in LPBB is significantly associated with a change in LSNGDP. However, other variables, namely LSBCP, IRR and FLI are found not to be associated with LSNGDP in the long run. The coefficient of ECM_{t-1} states that 12 per cent of the disequilibria of the previous quarter is corrected in the current quarter following a short-run shock.

6.7 Employment Opportunities

The level of employment depicts the economic status of a country. Most of the economically advanced countries are found to have low unemployment rate, whereas one of the common features of an economically poor country is a high unemployment rate. Government policies in the economically poor countries are directed toward increasing the employment opportunities. In this context, financial liberalisation also might have some implication on changing the level of employment in a country. To examine the financial liberalisation impact on employment opportunities, the following relationship is tested.

$$LPBCIA_t = \alpha_{43} + \alpha_{44}LFD_t + \alpha_{45}IRR_t + \alpha_{46}LPBB_t + \alpha_{47}FLI_t + \alpha_{48}D_{LPBCIA_t} + e_t \quad (6.10)$$

The above equation is constructed by adding a dummy D_{LPBCIA} in equation (4.19). The log of real per capita bank credit to industry and agriculture (LPBCIA), the log of the financial depth (LFD), the log of the average population per bank branch (LPBB), and the financial liberalisation index (FLI) are nonstationary series, whereas the real interest rate (IRR) is a stationary series. LPBCIA embraces a structural break in 1982:04, and this break is represented by D_{LPBCIA} in the equation.

To analyse the long run relationship between the variables in equation (6.10), the ARDL test is conducted. The AIC-based model (3,1,4,0,4) is employed, as this model is found to have a smaller prediction error than that of the SBC-based model (1,1,0,0,0). The results of the ARDL model are presented in Table 6.15 and Table 6.16.

Table 6.15 results show that all the variables except IRR form a long run relationship with LPBCIA. The relationship is highly significant. A one unit increase in LFD is associated with an increase of Rs.1.56 in the per capita bank credit to industry and agriculture sector. Similarly, a one unit decrease in LPBB is associated with an increase of Rs.2.19 in the LPBCIA. On the other hand, a one unit increase in FLI is associated with an increase of Rs.1.84 in LPBCIA¹¹. The coefficient of ECM_{t-1} implies that 41 per cent of the disequilibria that occurred in the previous quarter is corrected in the present quarter following a short-run shock.

¹¹ LPBCIA is in the log form, while FLI is in the level form. Antilog of the coefficient of FLI is 1.8397.

Table 6.15 ARDL (3,1,4,0,4) Model Long Run Results

Dependent Variable: LPBCIA

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	29.6808	4.1980	7.0703***
LFD	1.5558	0.2574	6.434***
IRR	0.0007	0.0060	0.1101
LPBB	-2.1856	0.3790	-5.7667***
FLI	0.6096	0.0780	7.8150***
D _{LPBCIA}	0.6892	0.1632	-4.2238***

*** Significant at 1% level

Table 6.16 ARDL (3,1,4,0,4) Model ECM Results

Dependent Variable: Δ LPBCIA

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	12.2060	2.1825	5.5926***
Δ LPBCIA1	0.1159	0.0913	1.2700
Δ LPBCIA2	0.2698	0.0965	2.7959***
Δ LFD	0.0054	0.3998	0.0125
Δ IRR	0.0003	0.0025	0.1098
Δ LPBB	-1.1359	0.5806	-1.9565**
Δ LPBB1	-0.1398	0.5536	-0.2525
Δ LPBB2	1.5185	0.6741	2.2527**
Δ LPBB3	1.2500	0.5910	2.1152**
Δ FLI	0.0758	0.1172	0.6468
Δ FLI1	-0.1751	0.1230	-1.4232
Δ FLI2	-0.3909	0.1210	-3.2304***
Δ FLI3	-0.3721	0.1286	-2.8932***
Δ D _{LPBCIA}	-0.2834	0.0699	-4.0537***
ECM _{t-1}	-0.4112	0.0556	-7.3987***

** Significant at 5% level

*** Significant at 1% level

Since the above measurement is indirect, the result should be interpreted carefully. From the above results, the amount of additional employment generated as the effect of financial liberalisation cannot be ascertained. However, it can be inferred that financial liberalisation has a positive impact on creating employment opportunities in industrial and agricultural sectors. Such impact emerges through an increase in the level of financial deepening, an increase in the number of bank branches, also due to the overall policy measures. This finding is consistent with the general hypothesis that the

increased total investment is positively associated with the increase in the number of jobs.

6.8 Redistribution of Income

One of the major concerns of a developing country is the redistribution of income. Economic growth that is not linked with a reasonable redistribution leads to an increased gap between rich and poor, and this may bring serious problems on other socio-economic fronts. In order to investigate the role of financial liberalisation in the redistribution of income, equation (4.21) is modified and empirically tested as follows:

$$LSBCPP_t = \alpha_{49} + \alpha_{50}LFD_t + \alpha_{51}IRR_t + \alpha_{52}LPBB_t + \alpha_{53}FLI_t + \alpha_{54}D_{LSBCPP_t} + e_t \quad (6.11)$$

A unit root test shows that the log of the share of bank credit to poor population (LSBCPP), the log of the financial depth (LFD), the log of the average population density per bank branch (LPBB) and the financial liberalisation index (FLI) are non-stationary variables and the real interest rate (IRR) is a stationary variable (see Chapter 5). Regressand LSBCPP has a structural break in 1991:03. Therefore, the dummy D_{LSBCPP} takes a value of 0 until 1991:03 and a value of 1 from 1991:04 onwards.

For equation (6.11), the model selection criteria SBC and AIC select the model of (1,1,0,0,0) and (1,4,0,0,3), respectively. The AIC-based model is employed here as it has the superior prediction power compared to that of the SBC based model¹². Table 6.17 and Table 6.18 contain ARDL test results.

The long run result table (Table 6.17) shows that the population density per bank branch (LPBB) and the composite index of financial liberalisation (FLI) are negatively associated with the share of bank credit for the poor population in the total credit (LSBCPP). This result indicates a mixed type of effect. A decrease in the population density per bank branch is associated with an increase in the share of bank credit to the poor population. This relationship states that an increase in the number of bank branches would lead to an increase in the share of the bank credit to the poor. Generally, the banks initially are established in big cities. As per the branch extension guidelines set by the NRB time to time, the banks must open new branches in rural areas in a given ratios.

¹² The mean prediction error of the SBC-based model is 0.0041, while that of the AIC based model is – 0.0015.

Therefore, the extension of the bank branches also means going from an urban to a rural area as well. This results in increased credit to the rural population.

Table 6.17 ARDL (1,4,0,0,3) Model Long Run Results

Dependent Variable: LSBCPP

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	3.6745	1.6894	2.1750**
LFD	-0.3298	0.3809	-0.8659
IRR	0.0026	0.0100	0.2630
LPBB	-1.2357	0.4304	-2.8708***
FLI	-0.6205	0.2021	-3.0704***
D _{LSBCPP}	0.3357	0.2103	1.5967

** Significant at 5% level

*** Significant at 1% level

Table 6.18 ARDL (1,4,0,0,3) Model ECM Results

Dependent Variable: Δ LSBCPP

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	0.6939	0.3611	1.9214*
Δ LFD	0.9904	0.2708	3.6568***
Δ LFD1	0.3162	0.2592	1.2196
Δ LFD2	-0.1261	0.2478	-0.5089
Δ LFD3	-0.5958	0.2423	-2.4596**
Δ IRR	0.0005	0.0019	0.2637
Δ LPBB	-0.2334	0.1039	-2.2471**
Δ FLI	-0.1655	0.0914	-1.8105*
Δ FLI1	0.1583	0.0905	1.7486*
Δ FLI2	0.2368	0.0908	2.6088**
Δ D _{LSBCPP}	0.0634	0.0401	1.5821
ECM _{t-1}	-0.1889	0.0581	-3.2502***

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

On the other hand, an increase in the summary measures of financial liberalisation is associated with a significant decrease in the share of the bank credit to the poor population. It can be inferred from this result that financial liberalisation is not helpful in poverty reduction since the overall effect of the policy is rather negatively associated with it. This means that an increase in the level of financial liberalisation would help increase the incidence of poverty.

The coefficient of ECM_{t-1} is at -0.1889 , which suggests a moderate speed of adjustment back to the long run equilibrium. This result is statistically significant at the 1 per cent level. The result specifically states that about 19 per cent of the disequilibrium exerted by a short run shock is corrected each quarter following the shock.

6.9 Financial Stability

Without the financial stability, the financial sector cannot become helpful in achieving higher economic growth. One of the hypotheses of financial liberalisation is that the financial sector remains vulnerable and instable in a repressed state, and that stability can be brought in with the implementation of liberalisation policies. In this context, the following relationship is tested in order to examine the impact of financial liberalisation on financial stability.

$$LCDR_t = \alpha_{55} + \alpha_{56}LRR_t + \alpha_{57}LPBB_t + \alpha_{58}FLI_t + \alpha_{59}D_{LCDR_t} + e_t \quad (6.12)$$

The above equation is constructed by adding a dummy (D_{LCDR}) in to equation (4.23). Among the variables included in the equation, the log of the credit-deposit ratio of banks ($LCDR$), the log of the average population density per bank branch ($LPBB$) and the financial liberalisation index (FLI) are nonstationary series, while the real lending rate (LRR) is a stationary series. $LCDR$ goes through a structural break in 1990:01 and it has been captured in D_{LCDR} .

To test the long run relationship between the variables in the equation, the ARDL model test is conducted. The AIC based ARDL model (1,1,3,4) is selected over the SBC based model (1,0,3,0) as the former has a smaller prediction error¹³. The ARDL test results are given in Table 6.19 and Table 6.20.

¹³ The SBC-based model has a mean prediction error of -0.0181 , while such error of the AIC-based model is 0.0074 .

Table 6.19 ARDL (1,1,3,4) Model Long Run Results

Dependent Variable: LCDR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
α_0	-4.6540	2.8817	-1.6150
LRR	-0.0159	0.0082	-1.9294*
LPBB	0.4251	0.2834	1.5002
FLI	0.3006	0.1443	2.0824**
D _{LCDR}	-0.2833	0.1235	-2.2929**

* Significant at 10% level

** Significant at 5% level

Table 6.20 ARDL (1,1,3,4) Model ECM Results

Dependent Variable: Δ LCDR

<i>Regressor</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-Ratio</i>
$\Delta\alpha$	-0.8081	0.4551	-1.7758*
Δ LRR	0.0010	0.0016	0.6397
Δ LPBB	-0.1647	0.2559	-0.6434
Δ LPBB1	1.1641	0.2407	4.8359***
Δ LPBB2	0.5799	0.2286	2.5362**
Δ FLI	-0.0472	0.0573	-0.8235
Δ FLI1	-0.0904	0.0570	-1.5860
Δ FLI2	-0.0119	0.0594	-0.2007
Δ FLI3	-0.1813	0.0610	-2.9722***
Δ D _{LCDR}	-0.0492	0.0190	-2.5914**
ECM _{t-1}	-0.1736	0.0418	-4.1576***

* Significant at 10% level

** Significant at 5% level

*** Significant at 1% level

The ARDL test result shows that there is a long-run relationship between FLI and LCDR. This relationship is statistically significant at the 1 per cent level. This result suggests that an increase in the composite index of financial liberalisation is associated with an increase in the credit-deposit ratio. As explained in Chapter 4, a higher credit-deposit ratio might be associated with higher non-performing assets of banks, and this may adversely affect the stability of the financial sector. From this point of view, the above result suggests that the summary measures of financial liberalisation bring instability to the financial sector. This finding is consistent with the fact that the bad loans of the Nepalese banking sector increased even after the implementation of financial liberalisation policies. The total bad loans of the banking sector in 2004 stood

at 29 per cent of the loan portfolios, and the share of such loans of NBL and RBB exceeded 50 per cent of their total loans (Himal 2005).

The coefficient of real lending rate (LRR), which is negative, indicates the inverse relationship between LRR and LCDR. But this coefficient misses the significance of the 5 per cent level. LPBB does not form a long-run relationship with LCDR. However, the change in LPBB seems to be associated with a change in LCDR.

The coefficient of ECM_{t-1} is statistically significant at the 1 per cent level. This states that there is a strong error correction mechanism, and 17 per cent of the deviation from the long-run equilibrium is corrected in the following quarter after a short-run shock.

6.10 Causality Test on Finance-Growth Variables

In order to examine whether one variable is causally related to another, Granger (1969) introduced a concept of causality which is commonly known as, ‘Granger causality’. The concept is based on the idea that the future cannot affect the present or the past. In a bivariate framework, if current and lagged values of X improve the prediction of the future value of Y, then it is said that X ‘Granger causes’ Y.

As discussed in Chapter 2 (Section 1.3), there has been a long debate about the direction of the causality between financial development and economic growth. With a view to examine this issue in the Nepalese context, the Granger causality test is conducted.

The unit root test in Chapter 5 shows that the proxy of economic growth (LGDP) and the proxy of financial development (LFD) are nonstationary series. As variables have to be stationary for the Granger causality test, the first difference of LGDP and LFD is used. The simple model of Granger causality is as follows:

$$\Delta LGDP_t = \sum_{i=1}^n \alpha_i \Delta LGDP_{t-i} + \sum_{j=1}^n \beta_j \Delta LFD_{t-j} + u_{1t} \quad (6.13)$$

$$\Delta LFD_t = \sum_{i=1}^n \lambda_i \Delta LFD_{t-i} + \sum_{j=1}^n \delta_j \Delta LGDP_{t-j} + u_{2t} \quad (6.14)$$

Equation (6.13) postulates that the current value of $\Delta LGDP$ is related to the past values of itself and the past values of ΔLFD . Similarly, equation (6.14) postulates that ΔLFD is related to the past values of itself and that of $\Delta LGDP$.

The null hypothesis in (6.13) is $\beta_j = 0$, which means, ‘ Δ LFD does not Granger cause Δ LGDPP’. Similarly, the null hypothesis in (6.14) is $\delta_j = 0$, and states ‘ Δ LGDPP does not Granger cause Δ LFD.’ The rejection or non-rejection of the null hypothesis is based on the F-statistics.

There are four possible cases related to the direction of the causality between LGDPP and LFD, which are:

- i) unidirectional causality from LFD to LGDPP
- ii) unidirectional causality from LGDPP to LFD
- iii) bilateral causality or feedback from each other
- iv) independence from each other or no causality

The data of the time series are in a quarterly frequency. A lag length of 4 has been chosen for the above models. The Granger causality test results are given in Table 6.21 below.

Table 6.21 Granger Causality Results

Sample: 1970:1 – 2003:4

Lags: 4

<i>Null Hypothesis</i>	<i>Observations</i>	<i>F-Statistics</i>	<i>Probability</i>
Δ LFD does not Granger cause Δ LGDPP	132	1.2385	0.2981
Δ LGDPP does not Granger cause Δ LFD	132	1.5209	0.2002

The above test results show that F-statistics for both cases are not significant. This implies that null hypothesis for both equations cannot be rejected at the 5 per cent level. From these results, it can be concluded that there is no causal relationship between financial development and economic growth. In other words, financial development and economic growth are independent of each other in the case of Nepal, between 1970-2003.

This result is in line with the cointegration test results for equation (6.6) and (6.8). These equations, which examine the relationship between LGDPP and LFD together with other relevant variables, do not find these variables to be significantly related. The finding is also consistent with the findings of Demetriades and Hussein

(1996), and Ram (1999). They also do not find any causal relationship existing between financial development and economic growth.

From the overall results of the cointegration test presented in this chapter, it can be inferred that the financial liberalisation in Nepal has brought some positive impact on financial development and economic growth, but some negative impact on the redistribution and financial stability aspects. This type of impact of financial liberalisation is represented by the Scenario VI of the integrated framework developed in Chapter 4, where the growth aspect is high but redistribution (or equality) and stability aspects are low.

Chapter 7

CONCLUSION

In the first section of this Chapter, major empirical findings of the study are summarised and their policy implications are discussed. The second section outlines the specific contributions made by this study. Finally, the third section presents some issues toward which further studies should be directed.

7.1 Empirical Findings and Policy Implications

The empirical test results show that financial liberalisation in Nepal has brought a mixed impact. The major findings and their policy implications are discussed in the following sub-sections.

7.1.1 Economic Growth and Industrial Development

The results suggest that the number of per capita bank branches is significantly associated with the widening of the financial sector, and that the financial widening affects financial development. The policy implication of this finding is that the government should encourage the branch extension of banks in order to speed up the financial development in the country.

Another finding of this study is that the real deposit rate is the key determinant of the time deposits whereas income is not. This finding suggests that irrespective of the changes in their income, people tend to save more when the real deposit rate is high. But people tend to choose to consume more or save in other forms than the time deposits at banks when the real deposit rate is low. Therefore, the real deposit rate should be kept high to increase the time deposits at banks.

This study finds that the savings in the form of the time deposits at banks affect the bank loans, but that the lending rate does not have a significant impact on the bank loan. The inelastic lending rate indicates toward the situation that the bank loans are in short supply. This fact implies that the savings in the form of time deposits at banks is to be increased in order to increase the volume of the bank loans.

The borrowing by commercial banks from the central bank and the overall financial liberalisation policies also help increase the volume of bank loans. However, the statistics show that commercial banks in Nepal are borrowing from the central bank in a very small amount. Therefore, the commercial banks can increase the borrowing from the central bank in order to increase their loan disbursement. Similarly, it can be argued that the continued implementation of the various financial liberalisation measures will help increase the bank lending.

The change in the number of bank branches has a positive impact on resource allocation. This finding suggests that when a bank is concentrated in a certain geographical area, it cannot find projects in an unlimited number that have a high return. As a consequence, after certain time, the bank has to extend loans even for projects with low returns and high risks. On the other hand, if the bank opens a new branch, the door for new investment opportunities is opened and the bank can extend loans for high return projects. Therefore, the resources can be allocated efficiently by increasing the number of bank branches.

The composite index of the financial liberalisation is positively associated with per capita income as well as with industrial development. It suggests that increased availability of financial resources has encouraged the opening of new investment projects in the agriculture as well as the non-agricultural sector. As a consequence, it has promoted the economic growth of the country. Increased investment in the non-agricultural sector has facilitated industrial development, which can have a long-term effect on economic growth. Thus, it can be argued that the implementation of financial liberalisation policies in Nepal has helped decrease the dependency on the agricultural sector.

7.1.2 Employment and Redistribution of Income

The financial deepening, the number of bank branches and the financial liberalisation measures collectively affect positively the bank loan to the agriculture and industrial sector. As agriculture and industry are the main employment-generating sectors, increased investment in these sectors are viewed to be linked with new job creation. Therefore, it can be argued that financial liberalisation has increased the employment opportunities in Nepal.

The population density per bank branch is positively associated with the volume of bank credit to the poor - but the overall measures of financial liberalisation is

negatively associated with such credit. The opening of a new bank branch generally means the extension of banking services out of the main cities. As this process continues, the bank services ultimately spread to the rural area where a majority of the poor population resides. The availability of loan facilities to the poor help the increase the income generating activities of the poor, and ultimately assists in the redistribution of income. In this way, the increased number of bank branches may also be helpful in poverty reduction.

On the other hand, the overall measures of financial liberalisation are found to be negatively associated with credit facilities to the poor. As financial liberalisation is related to the abolition of subsidies in interest rates and freedom given to the banks to extend their credit to high returning projects, there is a decrease in the flow of financial resources to the poor, along with the implementation of financial liberalisation measures. Therefore, an additional mechanism should be put side by side with the implementation of financial liberalisation measures in order to stop the decrease in the flow of the financial resources to the poor section of the population.

7.1.3 Financial Stability

The results of this study suggest that the financial liberalisation is positively associated with the credit-deposit ratio of the commercial bank. The credit-deposit ratio of a bank shows how much of the deposits collected from the depositors are extended as loan to the entrepreneurs or the consumers. As the banks have to pay certain interests on time deposits, they must invest the deposit money in such a way that they receive some return in excess of the interest paid by them on deposits. Keeping the deposit money idle means paying the interest by them without using the money. Therefore, the banks normally try to achieve a higher credit-deposit ratio.

However, a higher credit-deposit ratio is not only associated with a higher return but also with higher risk. If a large portion of the credit extended by a bank is not repaid, the financial health of the bank is seriously affected. If such situation is widespread in the banking system then there exists instability in the entire financial system. Therefore, a higher credit-deposit ratio makes the financial system vulnerable. Under the financially repressed state, a high reserve requirement is one of the key factors that forces the credit-deposit ratio of the banks to remain low. As the reserve requirement is drastically reduced under financial liberalisation, more funds are available to extend as loans resulting to a higher credit-deposit ratio and the financial

instability occurs in the form of higher credit-deposit ratio in the banking sector. Therefore, it can be argued that financial liberalisation brings financial instability. With a view to protect the financial system from becoming vulnerable, an appropriate mechanism should be devised and implemented simultaneously with the implementation of a financial liberalisation policy.

7.1.4 Finance-Growth Causality

There is a long debate about the cause and effect relationship between financial development and economic growth. However, the economists advocating the financial liberalisation policies believe that financial development can facilitate economic growth. Some of the past studies have supported this view, but the others have either presented inconclusive results or supported the opposite view point. This study does not find any causal relationship between financial development and economic growth in Nepal. It means that the financial development and economic growth move independently.

The core objective of financial liberalisation is to develop the financial sector with a belief that a healthy and strong financial sector would act as a catalyst for economic growth. If this belief were true, the financial development should have affected economic growth positively as a result of the financial liberalisation. But the above finding does not support this assertion. Therefore, it can be argued that financial liberalisation has not been able to facilitate the financial development so as to make it a cause of economic growth of the country.

7.2 Contribution of this Study

This study has made some significant contributions in the field. These contributions are discussed in the following subsections:

7.2.1 An Aggregated Framework for the Impact Evaluation

This study has put forward an aggregated framework for the impact evaluation. This framework is useful not only for the impact evaluation of the financial liberalisation, but also for the impact evaluation of each and every public policy.

There are a large number of studies in the field of financial liberalisation. Most of these studies focus on one or two aspects of it and generalise the result for the overall

policy implementation. The most frequently studied aspects of financial liberalisation include real interest rate and stock market development. More specifically, the impact of financial liberalisation on economic growth has been analysed in a greater detail (See Chapter 2.3), but the impact on the redistribution aspect is almost neglected. Similarly, the impact of liberalisation on financial stability also had been ignored until the Asian financial crisis.

The impact evaluation of a policy or program is done in order to assess the effectiveness of that policy or the program. The inference drawn based on only partial aspects excluding other important ones may provide wrong information to the policy makers. Further, policies based on such information cannot bring expected result. In some cases unexpected negative impact may occur instead. Such a situation can be blamed for most of the public policy failures. Therefore, this study emphasizes on the study of the overall impact of the policy in an aggregated framework that includes all the three aspects, *viz*-economic growth, redistribution of income and financial stability.

7.2.2 Overall Index of the Policy Measures

A summary index of the financial liberalisation policy measures has been developed in this study, which also takes into account the partial policy measures. Previous studies failed to properly include this part. Most of the studies are found either to treat the partial financial liberalisation as the full liberalisation, or exclude the partial liberalisation period by taking only the full liberalisation date. This is misleading, especially during the impact evaluation.

7.2.3 Methodological Contribution

Economists face method selection problems while conducting unit root tests on time series data. As a practical solution to this problem, a sequential procedure for the unit root test based on a general to specific approach has been developed and used in this study. This procedure helps determine the appropriated test method for each time series under consideration. By following this procedure, one can avoid the risk of misspecification and misleading results to a great extent.

7.2.4 First Study in the Nepalese Context

Nepal has been implementing the financial liberalisation policy for the last two decades. Although a couple of studies dealt with some aspects of financial liberalisation

in Nepal, no significant study is found to be conducted in the past on this field. Therefore, this is the first comprehensive study on the impact of the financial liberalisation in Nepal.

7.3 Direction for Future Research

There are some issues, which could not be covered in this study. These issues should be dealt with in future studies. The issues are presented in the following subsections.

7.3.1 In-depth Study on Redistribution and Poverty

Due to the unavailability of the data in a required frequency or the time length on poverty incidence, gini coefficient and unemployment rate, the study on the impact of financial liberalisation on employment, income redistribution and poverty reduction have been rather indirect. In-depth study should be conducted in this field by employing other possible methods and survey data.

7.3.2 External Sector Liberalisation

The external sector, which is partially liberalised in Nepal, has not been analysed in this study. The effect of international interest rate and exchange rate on domestic financial resources specifically may be a field of interest. Therefore, future studies can focus on this area.

7.3.3 India Factor

Due to the open border and other socio-economic ties, virtually every event in India comes to affect a respective sector in Nepal. For example, demand and supply situation in India significantly affects the demand and supply situation in Nepal. This effect is unidirectional coming from India due to the incomparable size of the country and its economy. In addition to that, financial liberalisation in Nepal and India started almost at the same time and continued at the same pace. In this context, it would be interesting to study the impact of Indian financial liberalisation on Nepal.

7.2.4 Measuring the Cost of Policy Implementation

Not only the benefits, but also the costs should be taken into account while assessing the effects of any policy implementation. Besides the expected changes, each and every policy may bring certain unexpected changes also, positive or negative, as the side effect of its implementation. A zero or negative impact on the targeted field and negative impact on other non-targeted fields may become the cost of the policy implementation. Although such costs cannot be quantified, these should be taken into account while conducting the impact evaluation. Therefore, future studies should try to develop some measures to quantify such costs.

APPENDIX A

Table A.1 Financial Liberalisation Policy Variables

Value assigned: 0 for none, 1 for full, and 0.33, 0.50 and 0.66 for partial-gradual deregulation

Year	IRD	REB	RRR	ECC	IPR	SMR	PSB	EAL
1970 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1971 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1972 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1973 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1974 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1975 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1976 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1977 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1978 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1979 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1980 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0

Year	IRD	REB	RRR	ECC	IPR	SMR	PSB	EAL
1981 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1982 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1983 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1984 Q1	0.33	1.00	0	0	0	0	0	0
Q2	0.33	1.00	0	0	0	0	0	0
Q3	0.33	1.00	0	0	0	0	0	0
Q4	0.33	1.00	0	0	0	0	0	0
1985 Q1	0.33	1.00	0	0	0	0	0	0
Q2	0.33	1.00	0	0	0	0	0	0
Q3	0.33	1.00	0	0	0	0	0	0
Q4	0.33	1.00	0	0	0	0	0	0
1986 Q1	0.66	1.00	0	0	0	0	0	0
Q2	0.66	1.00	0	0	0	0	0	0
Q3	0.66	1.00	0	0	0	0	0	0
Q4	0.66	1.00	0	0	0	0	0	0
1987 Q1	0.66	1.00	0	0	0	0	0	0
Q2	0.66	1.00	0	0	0	0	0	0
Q3	0.66	1.00	0	0	0	0	0	0
Q4	0.66	1.00	0	0	0	0	0	0
1988 Q1	0.66	1.00	0	0	0.50	0	0	0
Q2	0.66	1.00	0	0	0.50	0	0	0
Q3	0.66	1.00	0	0	0.50	0	0	0
Q4	0.66	1.00	0	0	0.50	0	0	0
1989 Q1	1.00	1.00	0	0	0.50	0	0	0
Q2	1.00	1.00	0	0	0.50	0	0	0
Q3	1.00	1.00	0	0	0.50	0	0	0
Q4	1.00	1.00	0	0	0.50	0	0	0
1990 Q1	1.00	1.00	0	0	0.50	0	0	0
Q2	1.00	1.00	0	0	0.50	0	0	0
Q3	1.00	1.00	0	0	0.50	0	0	0
Q4	1.00	1.00	0	0	0.50	0	0	0
1991 Q1	1.00	1.00	0	0.50	0.50	0	0	0
Q2	1.00	1.00	0	0.50	0.50	0	0	0
Q3	1.00	1.00	0	0.50	0.50	0	0	0
Q4	1.00	1.00	0	0.50	0.50	0	0	0
1992 Q1	1.00	1.00	0	0.50	0.50	0	0	0
Q2	1.00	1.00	0	0.50	0.50	0	0	0
Q3	1.00	1.00	0	0.50	0.50	0	0	0
Q4	1.00	1.00	0	0.50	0.50	0	0	0

Year	IRD	REB	RRR	ECC	IPR	SMR	PSB	EAL
1993 Q1	1.00	1.00	1.00	0.50	0.50	0	0	0
Q2	1.00	1.00	1.00	0.50	0.50	0	0	0
Q3	1.00	1.00	1.00	0.50	0.50	0	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	0	0	0.50
1994 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
1995 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
1996 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
1997 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
1998 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
1999 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
2000 Q1	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	0.50	1.00	0	0.50
2001 Q1	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
2002 Q1	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
Q2	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
Q3	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
Q4	1.00	1.00	1.00	0.50	1.00	1.00	0	0.50
2003 Q1	1.00	1.00	1.00	0.50	1.00	1.00	0.50	0.50
Q2	1.00	1.00	1.00	0.50	1.00	1.00	0.50	0.50
Q3	1.00	1.00	1.00	0.50	1.00	1.00	0.50	0.50
Q4	1.00	1.00	1.00	0.50	1.00	1.00	0.50	0.50

APPENDIX A

Table A.2 Quarterly Financial Liberalisation Index for Nepal

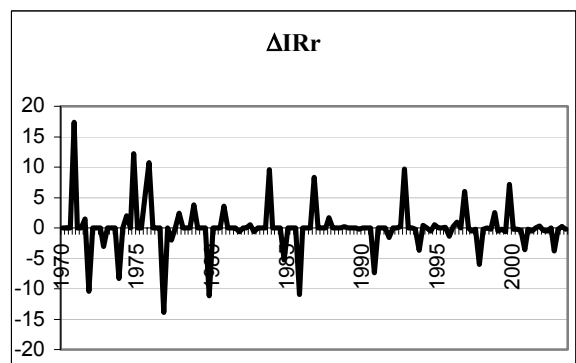
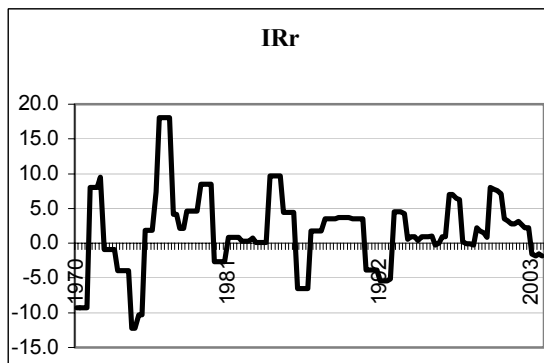
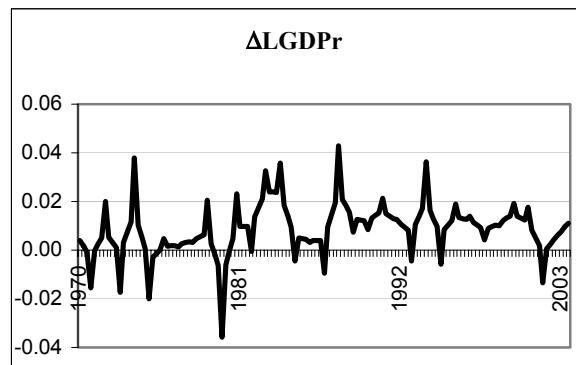
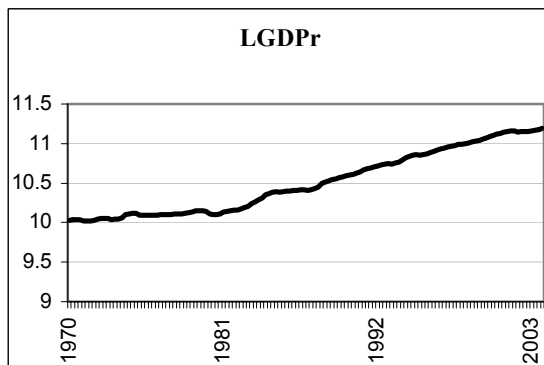
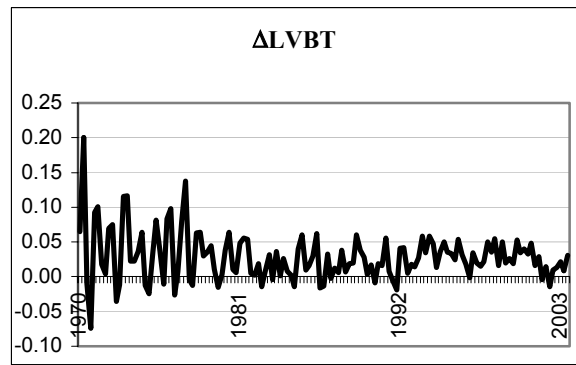
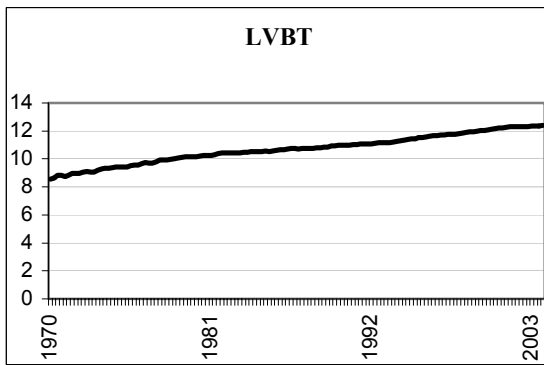
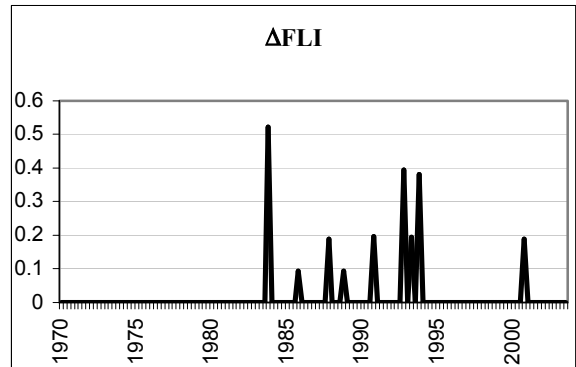
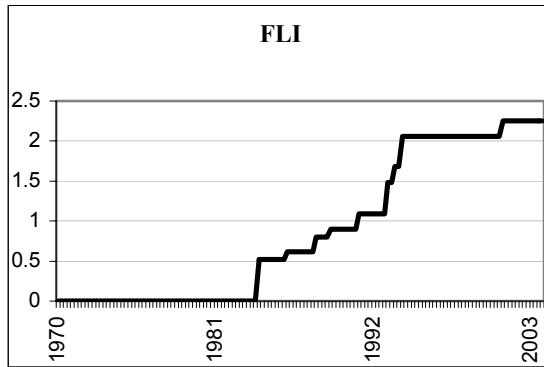
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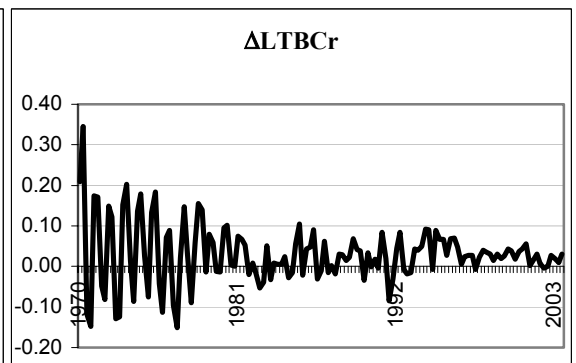
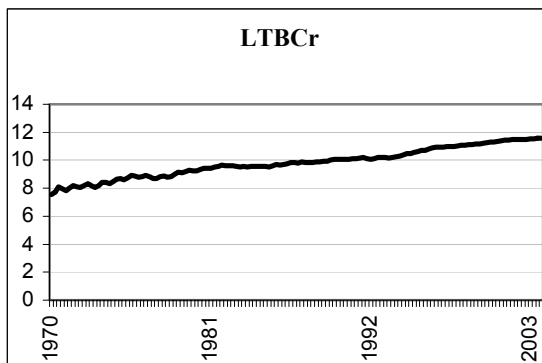
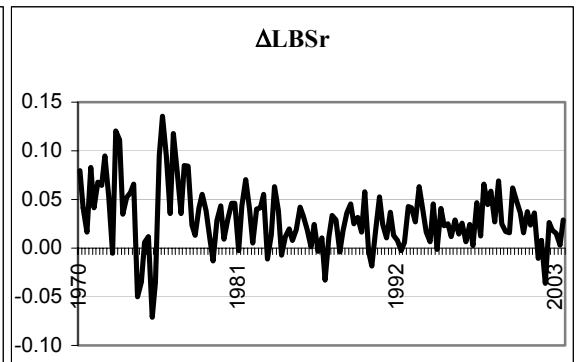
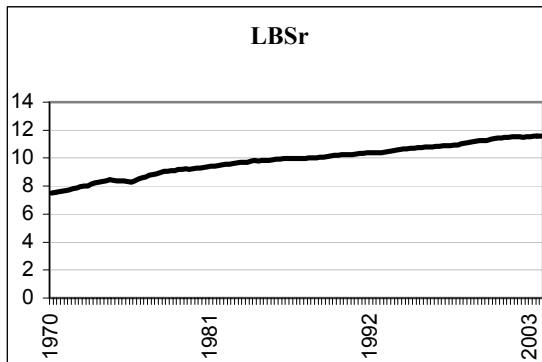
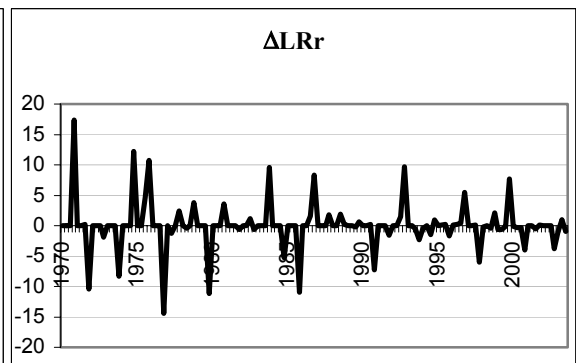
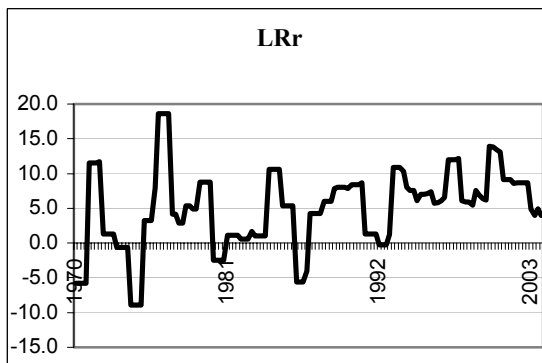
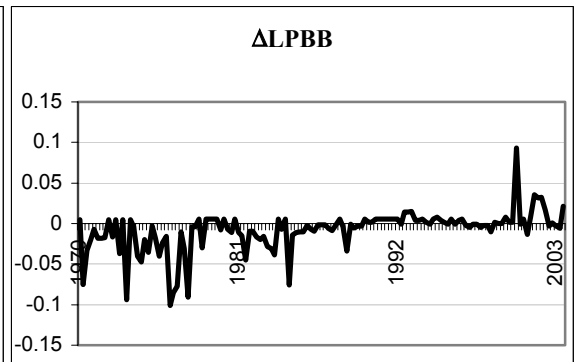
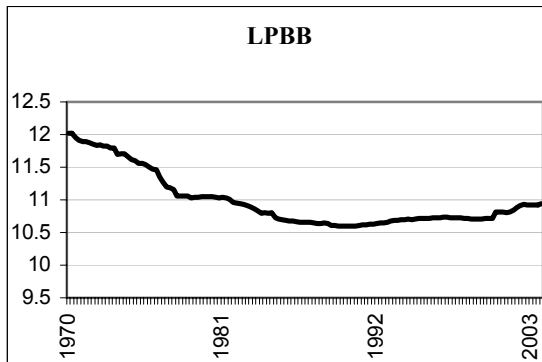
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Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1971 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1972 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1973 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1974 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1975 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1976 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1977 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1978 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1979 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1980 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
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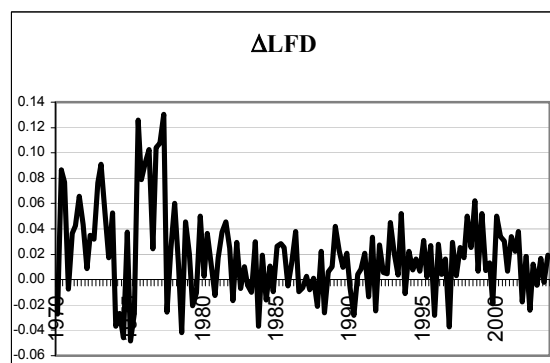
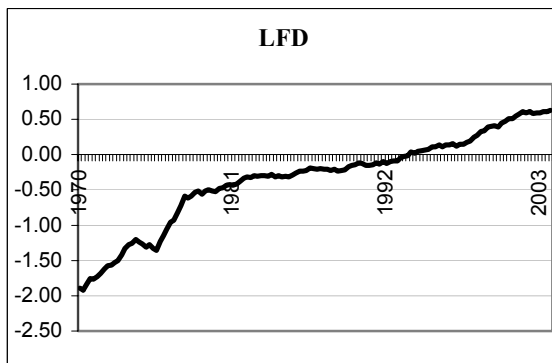
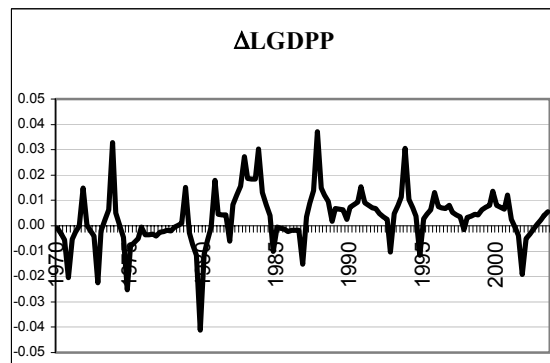
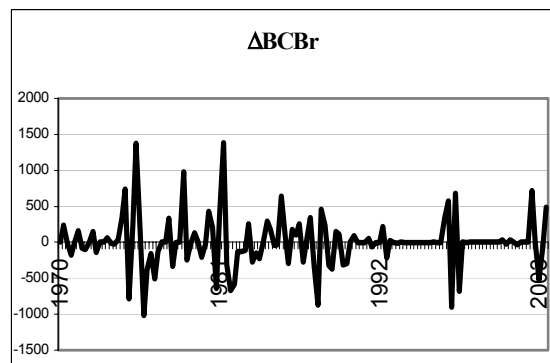
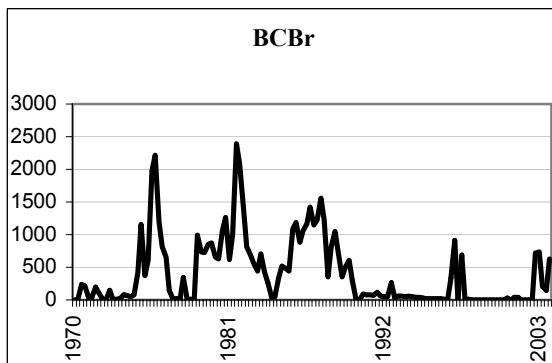
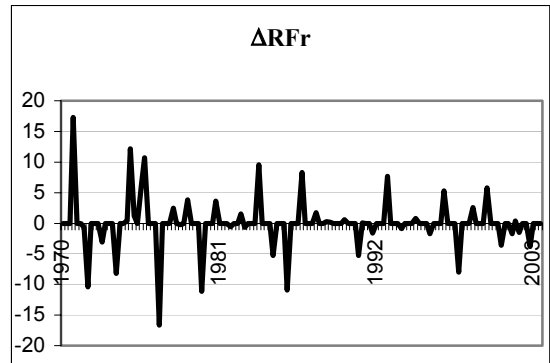
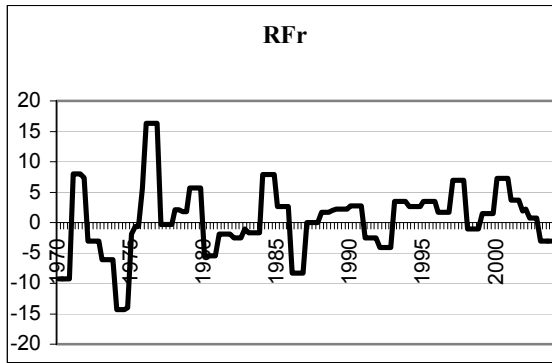
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Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1982 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1983 Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
1984 Q1	0.123	0.334	0	0	0	0	0	0.457
Q2	0.123	0.334	0	0	0	0	0	0.457
Q3	0.123	0.334	0	0	0	0	0	0.457
Q4	0.123	0.334	0	0	0	0	0	0.457
1985 Q1	0.123	0.334	0	0	0	0	0	0.457
Q2	0.123	0.334	0	0	0	0	0	0.457
Q3	0.123	0.334	0	0	0	0	0	0.457
Q4	0.123	0.334	0	0	0	0	0	0.457
1986 Q1	0.246	0.334	0	0	0	0	0	0.580
Q2	0.246	0.334	0	0	0	0	0	0.580
Q3	0.246	0.334	0	0	0	0	0	0.580
Q4	0.246	0.334	0	0	0	0	0	0.580
1987 Q1	0.246	0.334	0	0	0	0	0	0.580
Q2	0.246	0.334	0	0	0	0	0	0.580
Q3	0.246	0.334	0	0	0	0	0	0.580
Q4	0.246	0.334	0	0	0	0	0	0.580
1988 Q1	0.246	0.334	0	0	0.189	0	0	0.769
Q2	0.246	0.334	0	0	0.189	0	0	0.769
Q3	0.246	0.334	0	0	0.189	0	0	0.769
Q4	0.246	0.334	0	0	0.189	0	0	0.769
1989 Q1	0.373	0.334	0	0	0.189	0	0	0.896
Q2	0.373	0.334	0	0	0.189	0	0	0.896
Q3	0.373	0.334	0	0	0.189	0	0	0.896
Q4	0.373	0.334	0	0	0.189	0	0	0.896
1990 Q1	0.373	0.334	0	0	0.189	0	0	0.896
Q2	0.373	0.334	0	0	0.189	0	0	0.896
Q3	0.373	0.334	0	0	0.189	0	0	0.896
Q4	0.373	0.334	0	0	0.189	0	0	0.896
1991 Q1	0.373	0.334	0	0.197	0.189	0	0	1.092
Q2	0.373	0.334	0	0.197	0.189	0	0	1.092
Q3	0.373	0.334	0	0.197	0.189	0	0	1.092
Q4	0.373	0.334	0	0.197	0.189	0	0	1.092
1992 Q1	0.373	0.334	0	0.197	0.189	0	0	1.092
Q2	0.373	0.334	0	0.197	0.189	0	0	1.092
Q3	0.373	0.334	0	0.197	0.189	0	0	1.092
Q4	0.373	0.334	0	0.197	0.189	0	0	1.092

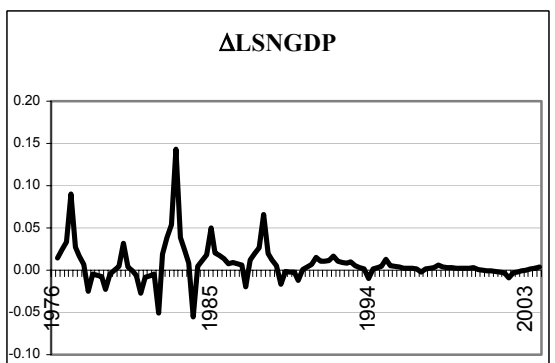
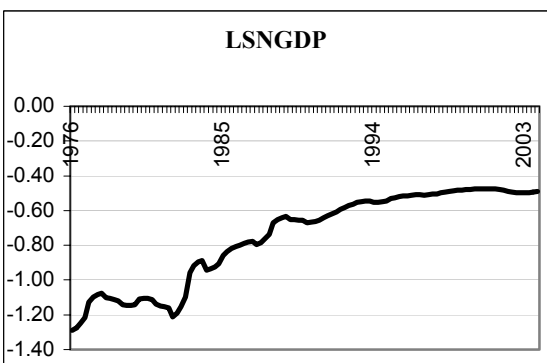
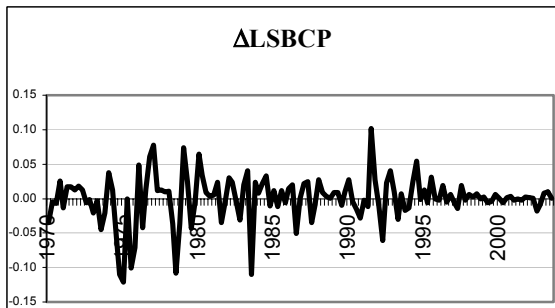
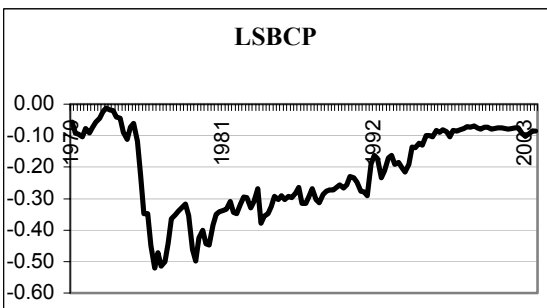
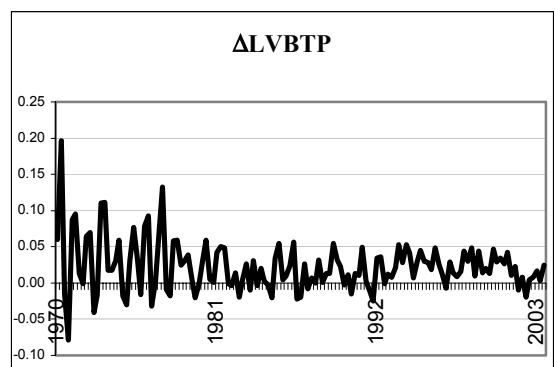
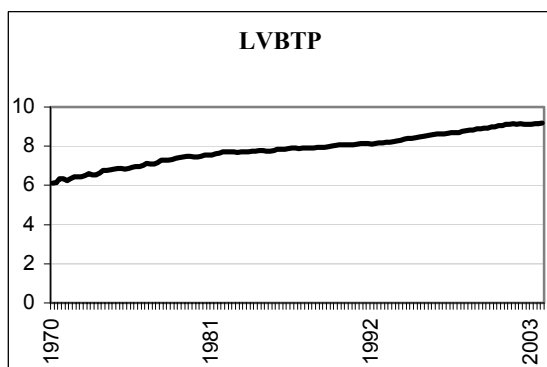
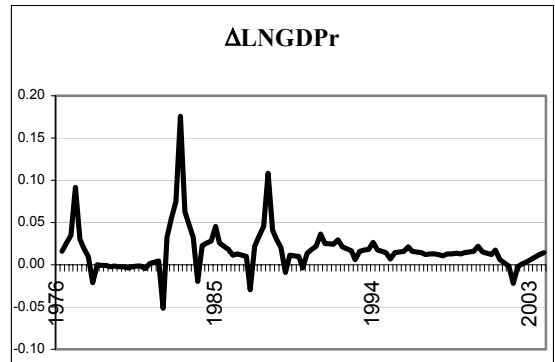
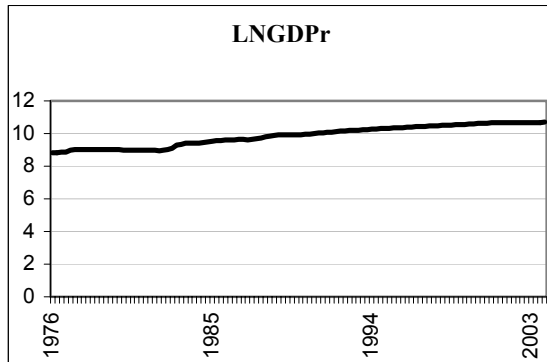
APPENDIX B

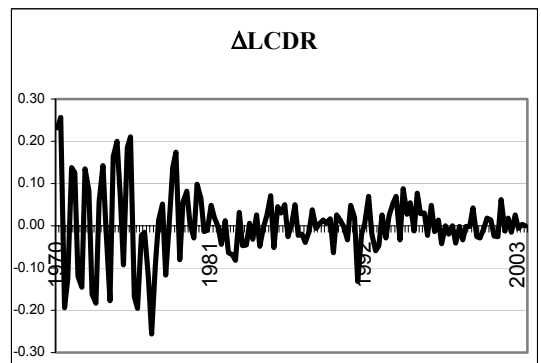
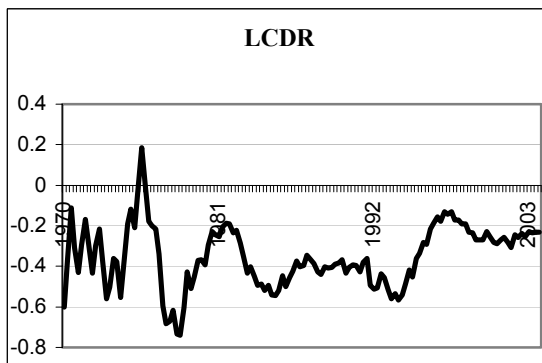
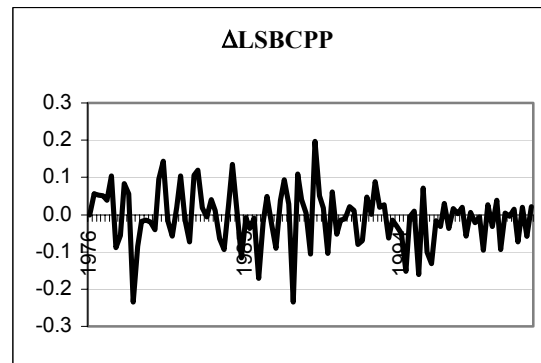
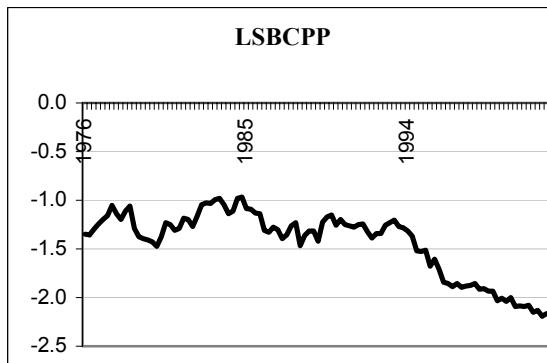
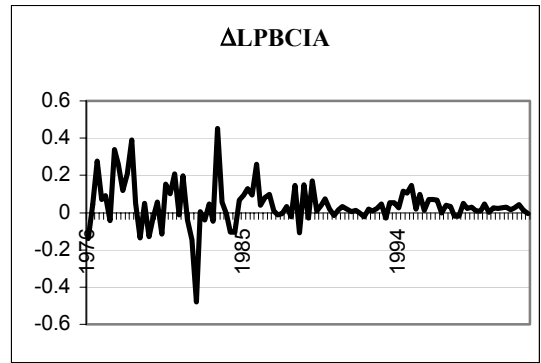
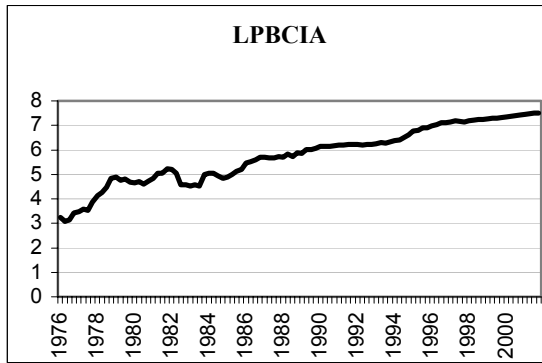
Graph of the Variables











APPENDIX C

Statistics of the ARDL Models

1. Financial Sector Widening (Equation 6.3)

1.1 Key Regression Statistics

$$R^2 = 0.9993$$

$$\text{Durbin-Watson Statistic} = 2.0486$$

$$F_{(8, 119)} = 22061.9 (0.000)$$

1.2 Diagnostic Test Results

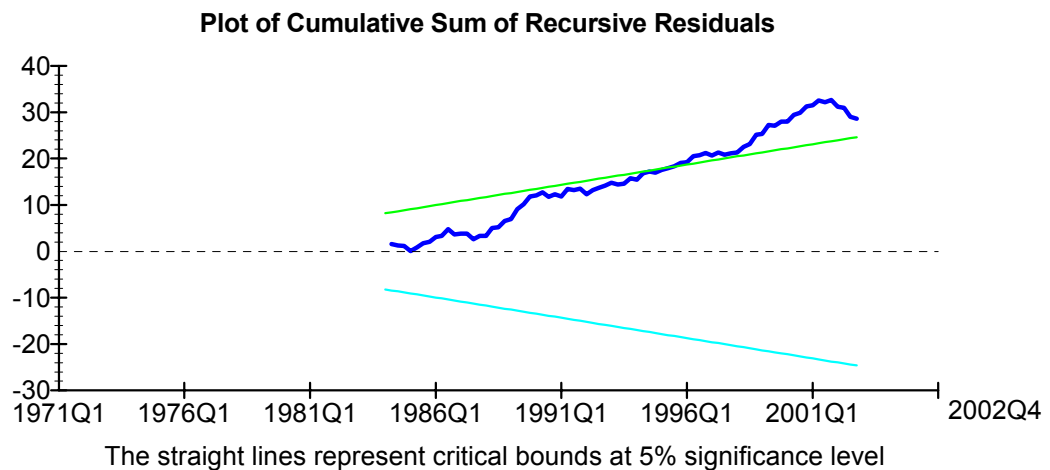
a. Serial Correlation $F_{(4, 115)} = 4.4868 (0.002)$

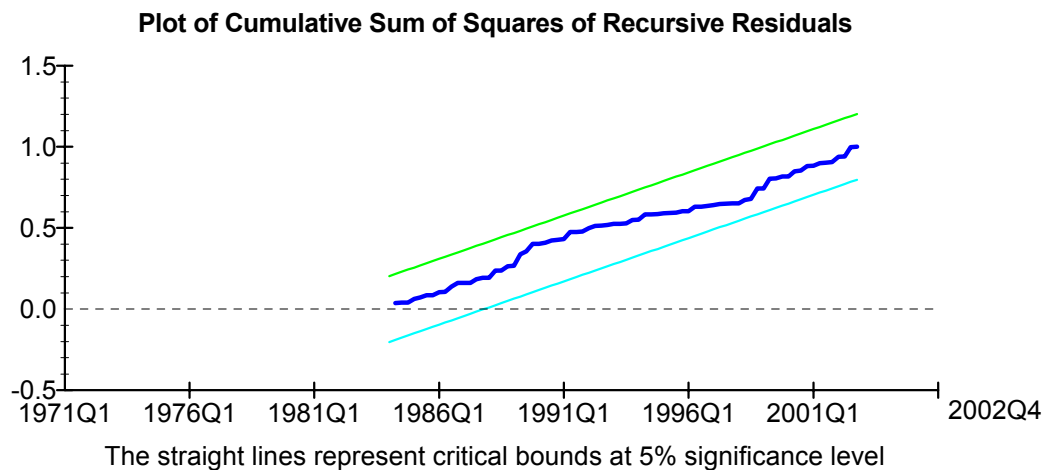
b. Functional Form $F_{(1, 118)} = 1.4753 (0.227)$

c. Normality $\chi^2 (2) = 0.6889 (0.709)$

d. Heteroscedasticity $F_{(1, 126)} = 4.7416 (0.031)$

1.3 Plot of CUSUM and CUSUMSQ (Stability Test)





2. Interest Rate and Savings (Equation 6.4)

2.1 Key Regression Statistics

$$R^2 = 0.9993$$

$$\text{Durbin-Watson Statistic} = 2.1215$$

$$F_{(16, 111)} = 10920.2 (0.000)$$

2.2 Diagnostic Test Results

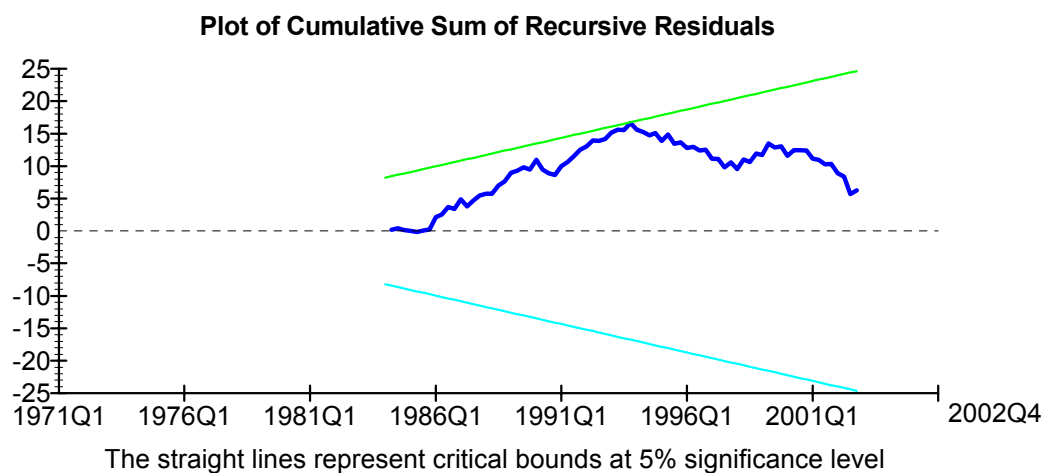
a. Serial Correlation $F_{(4, 107)} = 5.1425 (0.001)$

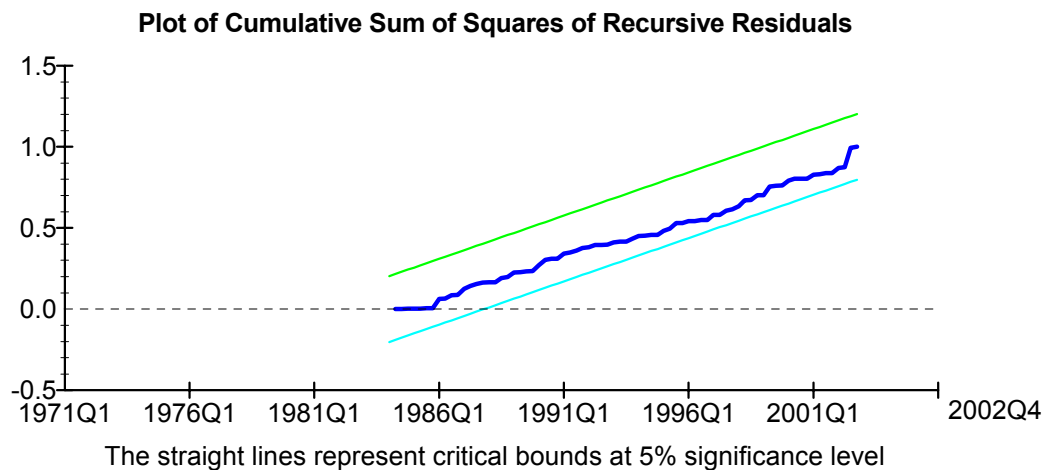
b. Functional Form $F_{(1, 110)} = 0.3951 (0.531)$

c. Normality $\chi^2 (2) = 3.1082 (0.211)$

d. Heteroscedasticity $F_{(1, 126)} = 4.1105 (0.045)$

2.3 Plot of CUSUM and CUSUMSQ (Stability Test)





3. Interest Rate and Investment (Equation 6.5)

3.1 Key Regression Statistics

$$R^2 = 0.9985$$

$$\text{Durbin-Watson Statistic} = 2.0510$$

$$F_{(11, 116)} = 6855.6 (0.000)$$

3.2 Diagnostic Test Results

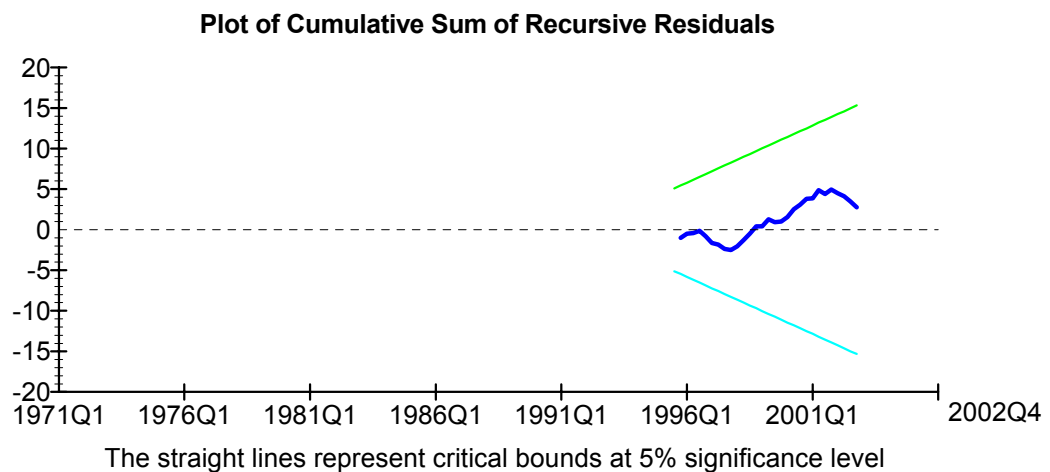
a. Serial Correlation $F_{(4, 112)} = 4.6084 (0.002)$

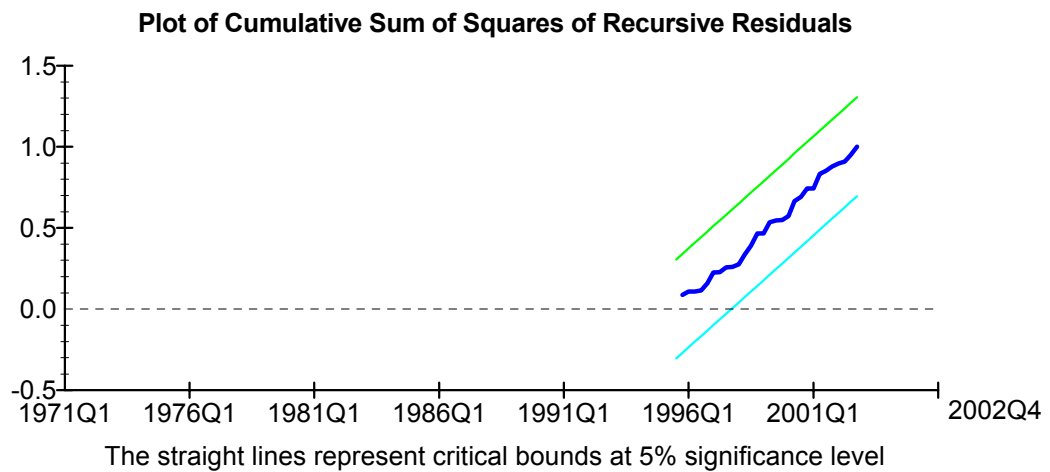
b. Functional Form $F_{(1, 115)} = 0.0053 (0.942)$

c. Normality $\chi^2 (2) = 0.1641 (0.921)$

d. Heteroscedasticity $F_{(1, 126)} = 5.4799 (0.021)$

3.3 Plot of CUSUM and CUSUMSQ (Stability Test)





4. Economic Growth (Equation 6.6)

4.1 Key Regression Statistics

$$R^2 = 0.9981$$

$$\text{Durbin-Watson Statistic} = 2.0762$$

$$F_{(7, 124)} = 9230.9 (0.000)$$

4.2 Diagnostic Test Results

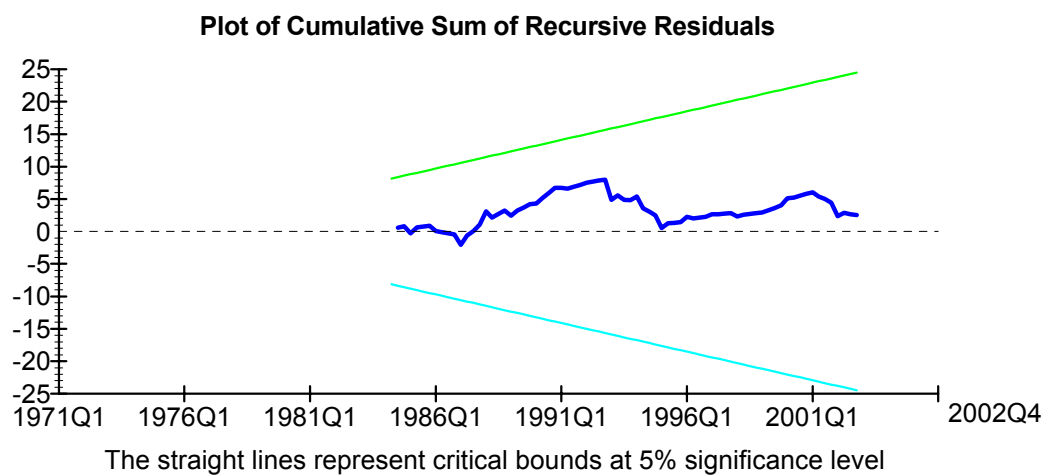
a. Serial Correlation $F_{(4, 120)} = 17.6708 (0.000)$

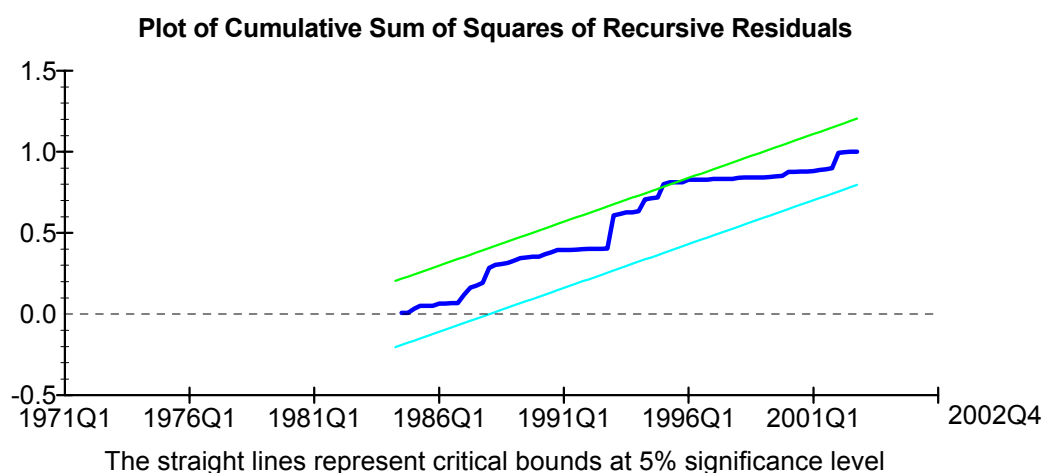
b. Functional Form $F_{(1, 123)} = 0.0653 (0.799)$

c. Normality $\chi^2 (2) = 121.0787 (0.000)$

d. Heteroscedasticity $F_{(1, 130)} = 4.2973 (0.040)$

4.3 Plot of CUSUM and CUSUMSQ (Stability Test)





5. Industrial Development (Equation 6.7)

5.1 Key Regression Statistics

$$R^2 = 0.9987$$

$$\text{Durbin-Watson Statistic} = 2.1935$$

$$F_{(9, 86)} = 7488.5 (0.000)$$

5.2 Diagnostic Test Results

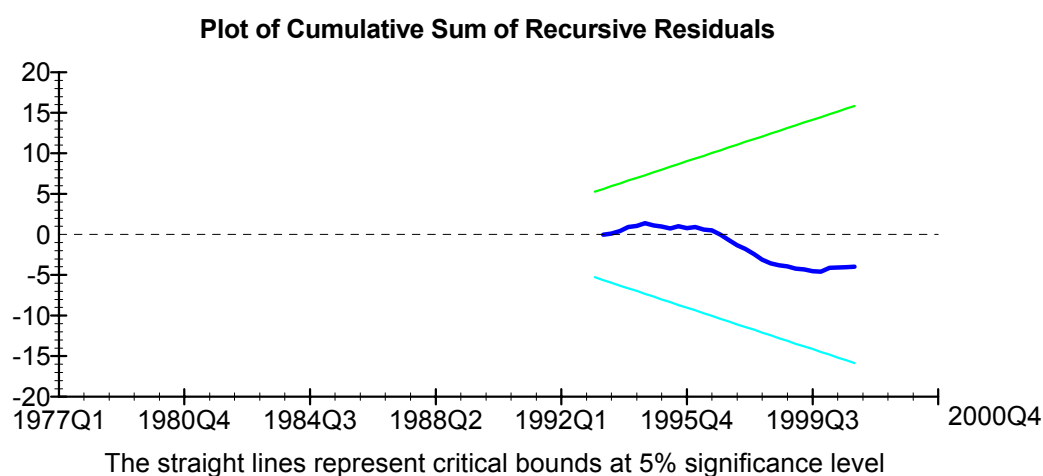
a. Serial Correlation $F_{(4, 82)} = 10.8018 (0.000)$

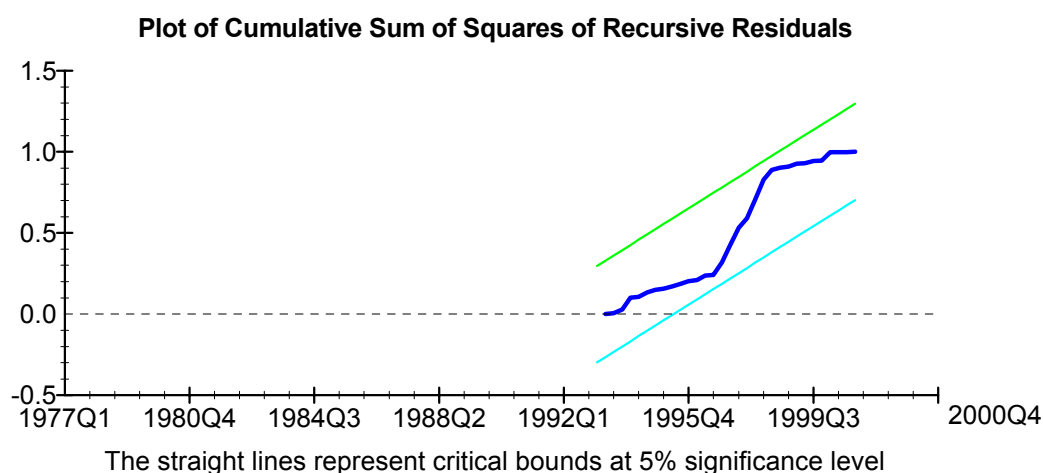
b. Functional Form $F_{(1, 85)} = 1.2346 (0.270)$

c. Normality $\chi^2 (2) = 413.8578 (0.000)$

d. Heteroscedasticity $F_{(1, 94)} = 5.6507 (0.019)$

5.3 Plot of CUSUM and CUSUMSQ (Stability Test)





6. Financial Deepening (Equation 6.8)

6.1 Key Regression Statistics

$$R^2 = 0.9986$$

$$\text{Durbin-Watson Statistic} = 2.2892$$

$$F_{(14, 113)} = 5921.4 (0.000)$$

6.2 Diagnostic Test Results

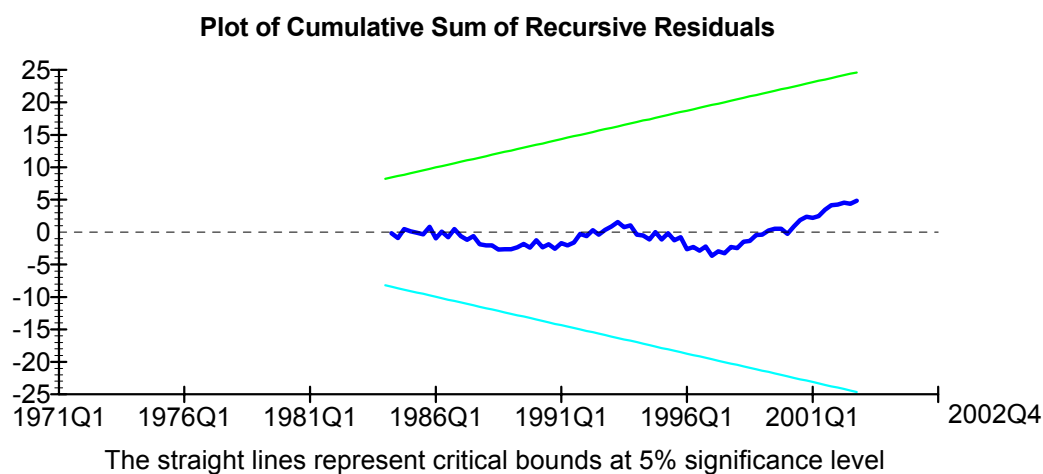
a. Serial Correlation $F_{(4, 109)} = 5.0421 (0.001)$

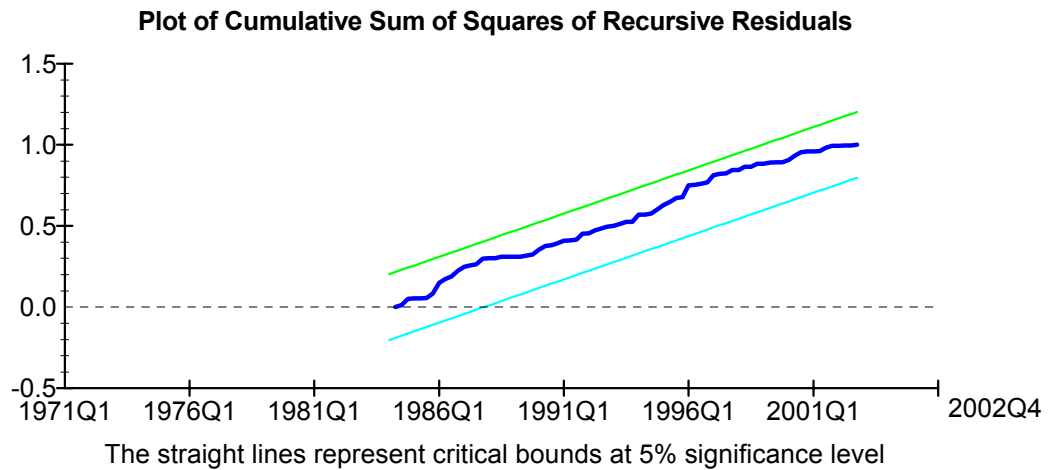
b. Functional Form $F_{(1, 112)} = 0.1312 (0.909)$

c. Normality $\chi^2 (2) = 12.9521 (0.002)$

d. Heteroscedasticity $F_{(1, 126)} = 16.5043 (0.000)$

6.3 Plot of CUSUM and CUSUMSQ (Stability Test)





7. Resource Allocation (Equation 6.9)

7.1 Key Regression Statistics

$$R^2 = 0.9954$$

$$\text{Durbin-Watson Statistic} = 2.0921$$

$$F_{(8, 95)} = 2565.91 (0.000)$$

7.2 Diagnostic Test Results

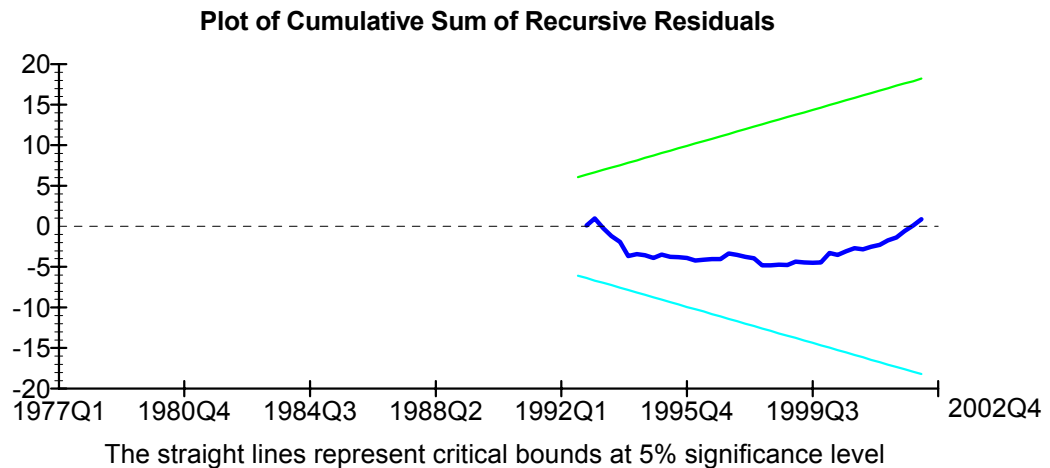
a. Serial Correlation $F_{(4, 91)} = 8.9399 (0.000)$

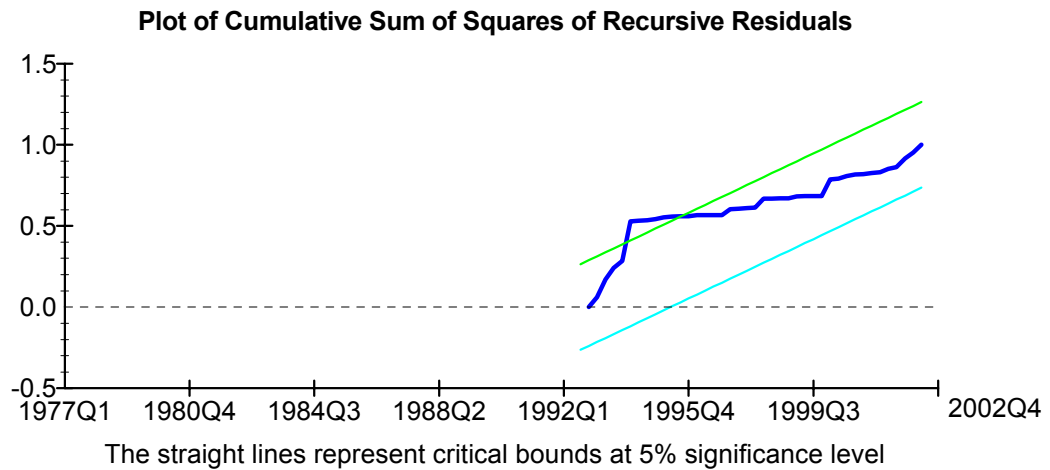
b. Functional Form $F_{(1, 94)} = 0.1363 (0.907)$

c. Normality $\chi^2 (2) = 812.9623 (0.000)$

d. Heteroscedasticity $F_{(1, 102)} = 4.7503 (0.032)$

7.3 Plot of CUSUM and CUSUMSQ (Stability Test)





8. Employment Opportunities (Equation 6.10)

8.1 Key Regression Statistics

$$R^2 = 0.9945$$

$$\text{Durbin-Watson Statistic} = 1.9907$$

$$F_{(17, 78)} = 829.4422 (0.000)$$

8.2 Diagnostic Test Results

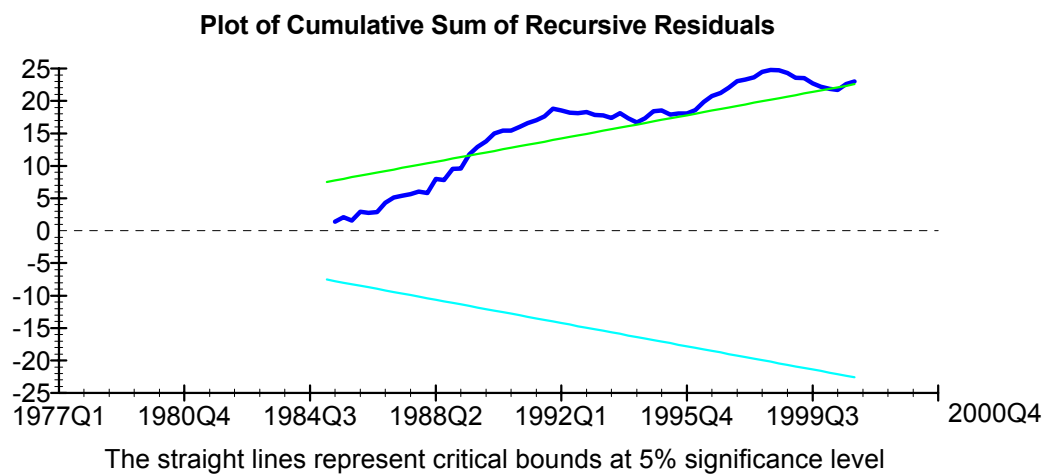
a. Serial Correlation $F_{(4, 74)} = 1.0616 (0.382)$

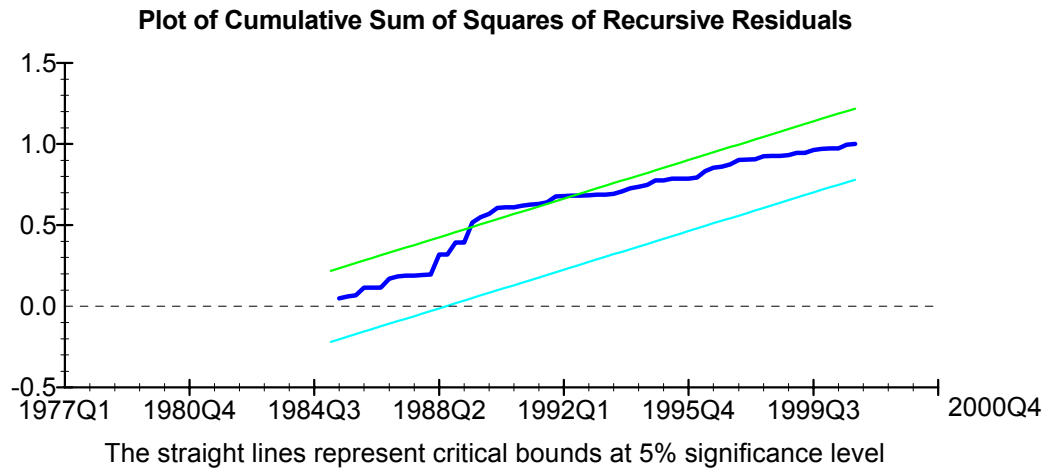
b. Functional Form $F_{(1, 77)} = 0.9127 (0.342)$

c. Normality $\chi^2 (2) = 50.5784 (0.000)$

d. Heteroscedasticity $F_{(1, 94)} = 7.3808 (0.008)$

8.3 Plot of CUSUM and CUSUMSQ (Stability Test)





9. Redistribution of Income (Equation 6.11)

9.1 Key Regression Statistics

$$R^2 = 0.9985$$

$$\text{Durbin-Watson Statistic} = 2.0510$$

$$F_{(11, 116)} = 6855.6 (0.000)$$

9.2 Diagnostic Test Results

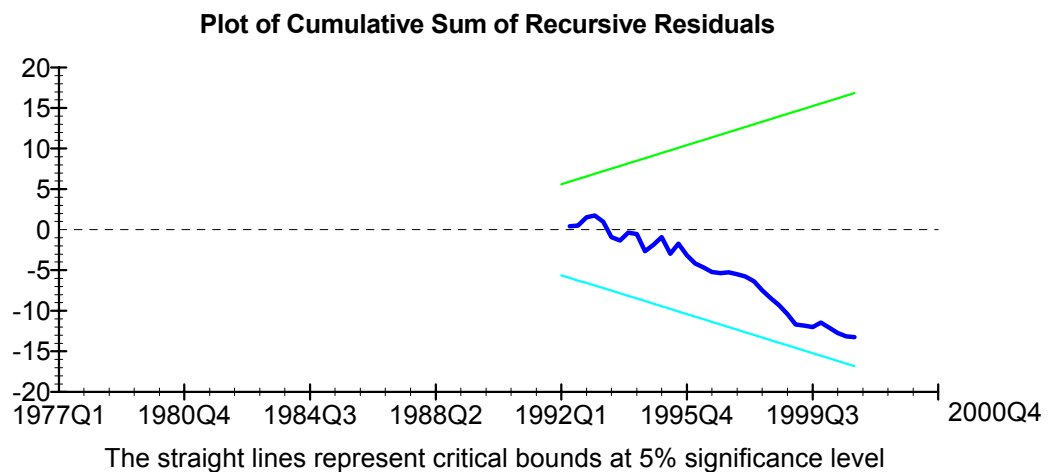
a. Serial Correlation $F_{(4, 112)} = 4.6084 (0.002)$

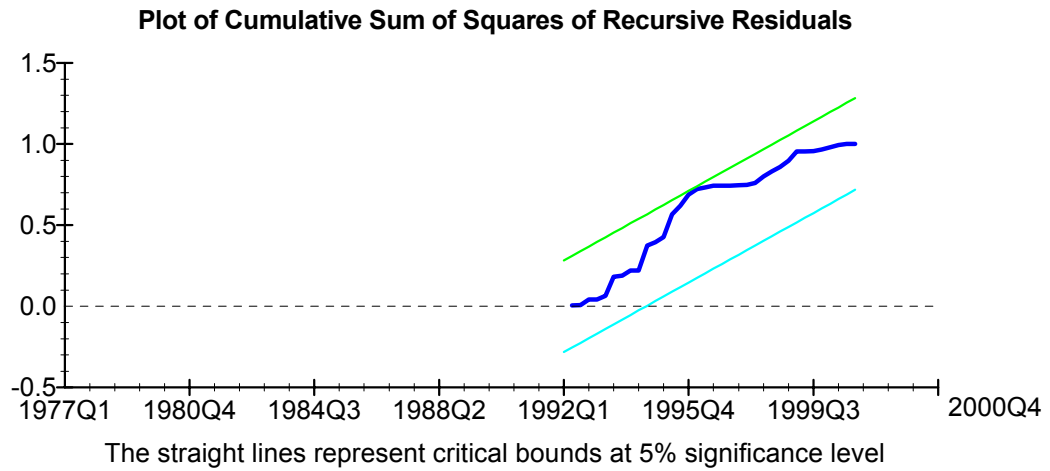
b. Functional Form $F_{(1, 115)} = 0.0053 (0.942)$

c. Normality $\chi^2 (2) = 0.1641 (0.921)$

d. Heteroscedasticity $F_{(1, 126)} = 5.4799 (0.211)$

9.3 Plot of CUSUM and CUSUMSQ (Stability Test)





10. Financial Stability (Equation 6.12)

10.1 Key Regression Statistics

$$R^2 = 0.9096$$

$$\text{Durbin-Watson Statistic} = 1.7305$$

$$F_{(13, 94)} = 72.7267 (0.000)$$

10.2 Diagnostic Test Results

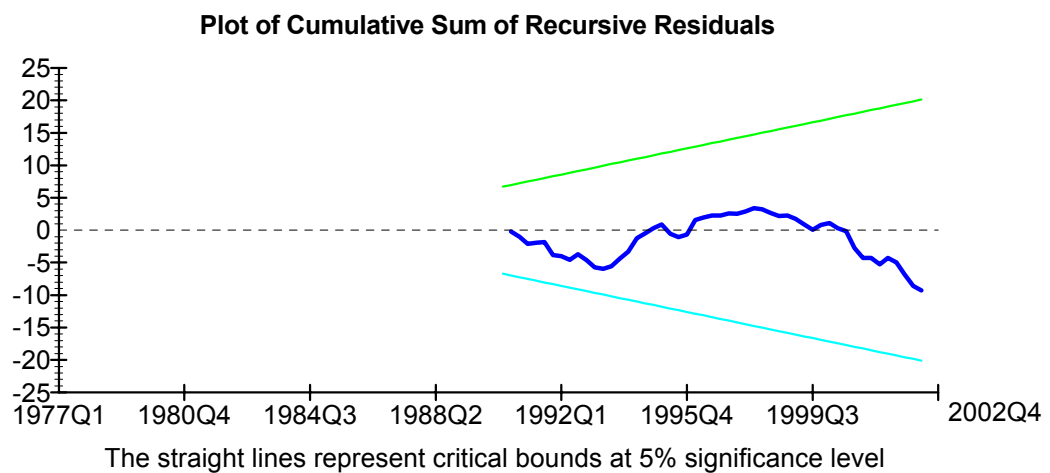
a. Serial Correlation $F_{(4, 90)} = 2.9458 (0.024)$

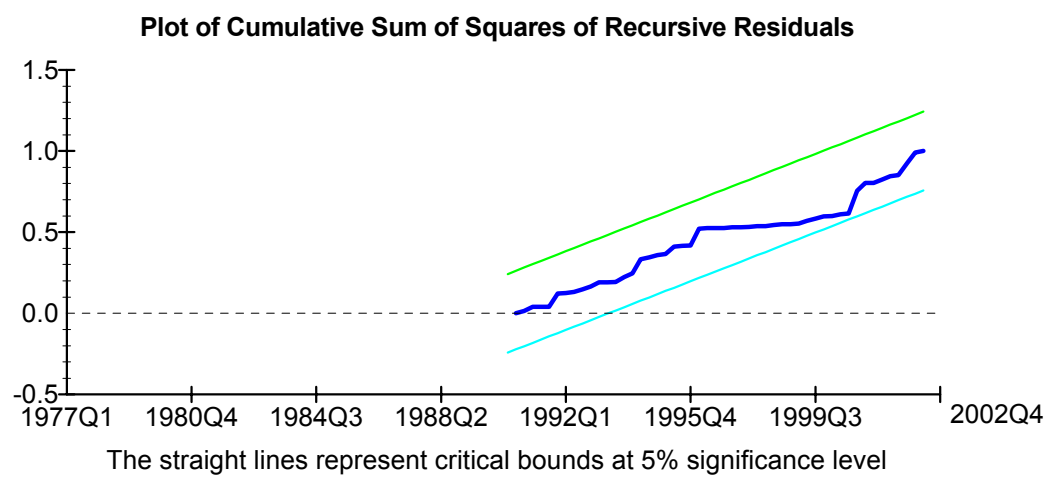
b. Functional Form $F_{(1, 92)} = 0.7625 (0.385)$

c. Normality $\chi^2 (2) = 2.0898 (0.352)$

d. Heteroscedasticity $F_{(1, 106)} = 0.0861 (0.770)$

10.3 Plot of CUSUM and CUSUMSQ (Stability Test)





REFERENCES

- Acharya, Keshab Prasad, Nar Bahadur Thapa and Shiva Sharma (1998). *Economic Liberalisation in Nepal: Sequence and Process*. Kathmandu, National Labour Academy and Oxfam GB-Nepal.
- Acharya, Meena (2003). "Development of the Financial System and Its Impact on Poverty Alleviation in Nepal." *Economic Review: Occasional Paper No.15*. Kathmandu, Nepal Rastra Bank.
- Acharya, Meena, Yuba Raj Khatiwada and Shankar Aryal (2003). *Structural Adjustment Policies and Poverty Eradication*. Kathmandu, Institute for Integrated Development Studies.
- Alba, Pedro, Amar Bhattacharya, Stijn Claessens, Swati Ghosh and Leonardo Hernandez (1999). "Volatility and Contagion in a Financially Integrated World: Lessons from East Asia's Recent Experience". In Gordon de Brouwer and Wisarn Pupphavesa (Eds.), *Asia Pacific Financial Deregulation*. London and New York, Routledge.
- Amable, Bruno and Jean-Bernard Chatelain (2001). "Can Financial Infrastructures Foster Economic Development?" *Journal of Development Economics* 64: 481-498.
- Arestis, Philip and Panicos Demetriades (1999). "Financial Liberalization: The Experience of Developing Countries." *Eastern Economic Journal* 25(4): 441-457.
- Arphasil, Prakarn (2001). "Financial Liberalization and Financial Crisis: The Case of Thailand". In Masayoshi Tsurumi (Eds.), *Financial Big Bang in Asia*. Aldershot, Ashgate Publishing Limited: 167-189.
- Asano, Akihito (2001). *Inequality and Economic Growth*. Unpublished PhD Dissertation. Canberra, The Australian National University School of Economics.
- Atkins, Frank J. and Patrick J. Coe (2002). "An ARDL Bounds Test of the Long-run Fisher Effect in the United States and Canada." *Journal of Macroeconomics* 24(2): 255-266.
- Bahmani-Oskooee, Mohsen, and A.B.M. Nasir (2004). "ARDL Approach to Test the Productivity Hypothesis." *Review of Development Economics* 8(3): 483-488.
- Bai, Jushan and Pierre Perron (2003). "Computation and Analysis of Multiple Structural Change Models." *Journal of Applied Econometrics* 18: 1-22.
- Bajracharya, Pushkar and Shankar Sharma (1996). *Impact of Economic Liberalization in Nepal*. Kathmandu, Institute for Integrated Development Studies.

- Bandiera, G, Gerald Caprio, Patrick Honohan and Fabio Schiantarelli (2000). "Does Financial Reform Raise or Reduce Saving?" *Review of Economics and Statistics* 82(2): 239-263.
- Banerjee, Anindya, Juan J. Dolado, John W. Galbraith and David F. Hendry (1993). *Co-integration, Error Correction, and the Econometric Analysis of Non-stationary Data*. Oxford, Oxford University Press.
- Banking Task Force (1999). *Banking Task Force Report*. Kathmandu, Nepal Rastra Bank.
- Bascom, Wilbert O. (1994). *The Economics of Financial Reform in Developing Countries*. London, The Macmillan Press Ltd.
- Basyal, Tula Raj (2002). "Overview of Macroeconomic Management: Stability and Growth", *SEACEN Workshop on Macroeconomic Management*, Pokhara, Nepal.
- Battle, Ann Marie (1997). "Welfare Effects of Liberalization Reforms with Distortions in Financial and Labor Markets." *Journal of Development Economics* 52(2): 279-294.
- Bayoumi, T. (1993). "Financial Deregulation and Household Saving." *Economic Journal* 103: 1432-1443.
- Beck, Thorsten and Ross Levine (2001). "Stock Markets, Banks, and Growth: Correlation or Causality", www.worldbank.org/research/pdffiles/becklevine.pdf.
- Beck, Thorsten, Ross Levine and Norman Loayza (2000). "Finance and Sources of Growth." *Journal of Financial Economics* 58: 261-300.
- Bekaert, Geert and Campbell R. Harvey (2000). "Foreign Speculators and Emerging Equity Markets." *Journal of Finance* 55: 565-614.
- Bekaert, Geert and Campbell R. Harvey (2001). "Economic Growth and Financial Liberalization." faculty.fuqua.duke.edu/~charvey/Research/Chapters/C22_Economic_growth_and_wp.pdf.
- Bekaert, Geert, Campbell R. Harvey and R. Lumsdaine (2000). "The Dynamics of Emerging Market Equity Flows." *NBER Working Paper* 7219.
- Bekaert, Geert, Campbell R. Harvey and Christian Lundblad (2001). "Does Financial Liberalization Spur Growth?" *NBER Working Paper* 8245.
- Bencivenga, Valerie R. and Bruce D. Smith (1991). "Financial Intermediation and Endogenous Growth." *Review of Economic Studies* 58(2): 195-209.

- Ben-David, Dan and David H. Papell (1998). "Slowdowns and Meltdowns: Postwar Growth Evidence from 74 Countries." *The Review of Economics and Statistics* 80(4): 561-571.
- Berthelemy, Jean Claude and Aristomene Varoudakis (1996). "Models of Financial Development and Growth: A Survey of Recent Literature". In Niels Herms and Robert Lensink (Eds.), *Financial Development and Economic Growth: Theory and Experiences from Developing Countries*. London, Routledge: 7-34.
- Bhattarai, Keshab R. (1998). "Welfare and Distributional Impacts of Financial Liberalization in a Developing Economy: Lessons from a Forward Looking CGE Model of Nepal", www.hull.ac.uk/php/ecskrb/Nepal.pdf.
- Binswanger, Hans P., Shahidur R. Khandker and Mark R. Rosenzweig (1993). "How Infrastructure and Financial Institutions Affect Agricultural Output and Investment in India." *Journal of Development Economics* 41: 337-366.
- Blommestein, Hans J. and Michael G. Spencer (1996). "Sound Finance and the Wealth of Nations." *North American Journal of Economics and Finance* 7(2): 115-124.
- Buffie, Edward F. (1984). "Financial Repression, the New Structuralists, and Stabilization Policy in Semi-industrialized Economies." *Journal of Development Economics* 14: 305-322.
- Campos, Julia, Neil R. Ericsson and David F. Hendry (1996). "Cointegration Tests in the Presence of Structural Breaks." *Journal of Econometrics* 70: 187-220.
- Caprio, Gerald, Patrick Honohan and Joseph E. Stiglitz, Eds. (2001). *Financial Liberalization: How Far, How Fast?* Cambridge, Cambridge University Press.
- Carlin, Wendy and Colin Mayer (2003). "Finance, Investment and Growth", www.elsevier.com/locate/econbase.
- Chandavarkar, Anand (1992). "Of Finance and Development: Neglected and Unsettled Questions." *World Development* 20(1): 133-142.
- Chang, Ha-Joon, Gabriel Palma and D. Hugh Whittaker, (Eds.) (2001). *Financial Liberalization and the Asian Crisis*. Hampshire, UK, Palgrave.
- Charemza, Wojciech W. and Derek F. Deadman (1992). *New Directions in Econometric Practice: General to Specific Modelling, Cointegration and Vector Autoregression*. Aldershot, Edward Elgar.
- Cheung, Lillian (1998). *An Integrative and Dynamic Analysis of Business Bankruptcy in Australia*. Unpublished PhD Dissertation. Wollongong, University of Wollongong, Department of Economics.

- Chin, Kok Fay and K.S. Jomo (2001). "Financial Reform and Crisis in Malaysia". In Masayoshi Tsurumi (Eds.), *Financial Big Bang in Asia*. Aldershot: Ashgate Publishing Limited: 225-249.
- Cho, Yoon Je (1986). "Inefficiencies from Financial Liberalization in the Absence of Well-Functioning Equity Markets." *Journal of Money, Credit and Banking* 18(2): 191-199.
- Cho, Yoon Je (1988). "The Effect of Financial Liberalization on the Efficiency of Credit Allocation." *Journal of Development Economics* 29: 101-110.
- Cho, Yoon Je (1990). "McKinnon-Shaw versus the Neostructuralists on Financial Liberalization: A Conceptual Note." *World Development* 18(3): 477-480.
- Choe, Chongwoo and Imad A. Moosa (1999). "Financial System and Economic Growth: The Korean Experience." *World Development* 27(6): 1069-1082.
- Choksi, Armeane M. and Demetris Papageorgiou, Eds. (1986). *Economic Liberalization in Developing Countries*. Oxford, New York, Basil Blackwell.
- Christopoulos, Dimitris K. and Efthymios G. Tsionas (2004). "Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests." *Journal of Development Economics* 73: 55-74.
- Crotty, James and Kang-Kook Lee (2002). "Is Financial Liberalization Good for Developing Nations? The Case of South Korea in the 1990s." *Review of Radical Political Economics* 34: 327-334.
- Daitoh, Ichiro (2003). "Financial Liberalization, Urban Unemployment and Welfare: Some Implications of the Artificial Low Interest Rate and the High Wage Rate Policies in LDCs." *Journal of Development Economics* 72(1): 163-179.
- Davidson, Russell and James G. Mackinnon (1993). *Estimation and Inference in Econometrics*. Oxford, Oxford University Press.
- de Brouwer, Gordon and Wisarn Pupphavesa, (Eds.) (1999). *Asia Pacific Financial Deregulation*. London, Routledge.
- De Gregorio, Jose and Pablo E. Guidotti (1995). "Financial Development and Economic Growth." *World Development* 23: 433-448.
- De Santis, Giorgio and Selahattin Imrohorglu (1997). "Stock Returns and Volatility in Emerging Financial Markets." *Journal of International Money and Finance* 16(4): 561-579.

- Demetriades, Panicos O. and Khaled A. Hussein (1996). "Does Financial Development Cause Economic Growth? Time-series Evidence from 16 Countries." *Journal of Development Economics* 51: 387-411.
- Demetriades, Panicos O. and Kul B. Luintel (1996a). "Banking Sector Policies and Financial Development in Nepal." *Oxford Bulletin of Economics and Statistics* 58(2): 355-372.
- Demetriades, Panicos O. and Kul B. Luintel (1996b). "Financial Development, Economic Growth and Banking Sector Controls: Evidence from India." *The Economic Journal* 106: 359-374.
- Demetriades, Panicos O. and Kul B. Luintel (1997). "The Direct Costs of Financial Repression: Evidence from India." *Review of Economics and Statistics* 79(2): 311-320.
- Demirguc-Kunt, Asli and Enrica Detragiache (2001). "Financial Liberalization and Financial Fragility". In Gerald Caprio, Patrick Honohan and Joseph E. Stiglitz (Eds.), *Financial Liberalization: How Far, How Fast?* Cambridge, Cambridge University Press.
- Demirguc-Kunt, Asli and Ross Levine (1996). "Stock Market Development and Financial Intermediaries: Stylized Facts." *World Bank Economic Review* 10(2): 291-322.
- Denizer, Cevdet, Raj M. Desai and Nikolay Gueorguiev (1988). "The Political Economy of Financial Repression in Transition Economies", www.worldbank.org/html/dec/Publications/Workpapers/wps2000series/wps2030/wps2030-abstract.html.
- Diaz-Alejandro, Carlos (1985). "Good-Bye Financial Repression, Hello Financial Crash." *Journal of Development Economics* 19: 1-24.
- Domowitz, Ian, Jack Glen and Ananth Madhavan (1998). "International Cross-Listing and Order Flow Migration: Evidence from an Emerging Markets." *Journal of Finance* 53(6): 2001-2027.
- Dooley, Michael P. (1997). "Financial Liberalization and Policy Challenges", *Proceedings of the Conference on Financial Market Integration*, Santiago, Chile.
- Dornbusch, Rudiger and Alejandro Reynoso (1989). "Financial Factors in Economic Development." *Perspectives on Economic Development* 79(2): 204-209.
- Dornbush, Rudiger, Stanley Fisher and Richard Startz (2001). *Macroeconomics*. New Delhi, Tata McGraw-Hill Publishing Company Limited.
- Edwards, Sebastian (1986). "The Order of Liberalization of the Current and Capital Accounts of the Balance of Payments". In Armeane M. Choksi and Demetris

- Papageorgiou (Eds.), *Economic Liberalization in Developing Countries*. Oxford New York, Basil Blackwell: 185-216.
- Edwards, Sebastian (1989). "On the Sequencing of Structural Reforms." *OECD Working Papers* 70.
- Edwards, Sebastian and Sweder van Wijnbergen (1986). "The Welfare Effects of Trade and Capital Market Liberalization." *International Economic Review* 27(1): 141-148.
- Eichengreen, Barry and Michael Mussa (1998). "Capital Account Liberalization and the IMF." *Finance and Development* 35(4).
- Enders, Walter (2004). *Applied Econometric Time Series, 2nd Edition*. New Jersey, J. Wiley.
- Engle, Robert F. and C.W.J. Granger (1987). "Co-integration and Error Correction: Representation, Estimation, and Testing." *Econometrica* 55(2): 251-276.
- Espinosa, Marco and William C. Hunter (1994). "Financial Repression and Economic Growth." *Economic Review*. Atlanta, Federal Reserve Bank of Atlanta.
- EViews 5 User's Guide* (2004), Irvine, California, Quantitative Microsoftware.
- Fase, M. M. G. and R. C. N. Abma (2003). "Financial Environment and Economic Growth in Selected Asian Countries." *Journal of Asian Economics* 14: 11-21.
- Fry, Maxwell J. (1980). "Saving, Investment, Growth and the Cost of Financial Repression." *World Development* 8(1): 317-327.
- Fry, Maxwell J. (1995). *Money, Interest, and Banking in Economic Development*. Baltimore, The Johns Hopkins University Press.
- Fry, Maxwell J. (1997). "In Favour of Financial Liberalisation." *The Economic Journal* 107: 754-770.
- Galbis, Vicente (1977) "Financial Intermediation and Economic Growth in Less-Developed Countries: A Theoretical Approach." *Journal of Development Studies* 13(2): 58-72.
- Galindo, Arturo, Alejandro Micco and Guillermo Ordonez (2002). "Financial Liberalization and Growth: Empirical Evidence", www.worldbank.org/research/conferences/financial_globalization/financial_liberalization_version23.pdf.
- Galindo, Arturo, Fabio Schiantarelli and Andrew Weiss (2001). "Does Financial Liberalization Improve the Allocation of Investment? Micro Evidence from Developing Countries", ideas.repec.org/p/bpc/bocoec/503.html.

- Garnaut, Ross (1998). "Economic Lessons". In Ross H. McLeod and Ross Garnaut (Eds.), *East Asia in Crisis: From Being a Miracle to Needing One?* London and New York, Routledge: 352-366.
- Ghatak, Subrata and Jalal U. Siddiki (2001). "The Use of the ARDL Approach in Estimating Virtual Exchange Rates in India." *Journal of Applied Statistics* 28(5): 573-583.
- Girma, Abu (2003). "Financial Sector Liberalization in Developing Countries", eea.ethiopiaonline.net/Econ.foc/ef3-4/Abu.htm.
- Glick, Reuven, Ramon Moreno and Mark S. Spiegel, Eds. (2001). *Financial Crises in Emerging Markets*. Cambridge, Cambridge University Press.
- Goldsmith, Raymond W. (1958). *Financial Intermediaries in the American Economy Since 1900*. Princeton, Princeton University Press.
- Goldsmith, Raymond W. (1969). *Financial Structure and Development*. New Haven, Yale University Press.
- Granger, C.W.J. (1969). "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods." *Econometrica* 37(3): 424-438.
- Granger, C.W.J. and P. Newbold (1974). "Spurious Regression in Econometrics." *Journal of Econometrics* 2: 111-120.
- Greene, William H. (2000). *Econometric Analysis*. New Jersey, Prentice Hall.
- Greenwood, Jeremy and Boyan Jovanovic (1990). "Financial Development, Growth, and the Distribution of Income." *Journal of Political Economy* 98(5): 1076-1107.
- Griffiths, William E., R. Carter Hill and George G. Judge (1993). *Learning and Practicing Econometrics*. New York, John Wiley and Sons, Inc.
- Gruben, William C. and Darryl McLeod (2002). "Capital Account Liberalization and Inflation." *Economics Letters* 77(2): 221-225.
- Guha-Khasnobis, Basudeb and Saumitra N. Bhaduri (2000). "A Hallmark of India's New Economic Policy: Deregulation and Liberalisation of the Financial Sector." *Journal of Asian Economics* 11: 333-346.
- Gujarati, Damodar N. (2003). *Basic Econometrics*, Fourth Edition. Boston, McGraw-Hill, Inc.
- Gupta, Kanhaya L. (1984). *Finance and Economic Growth in Developing Countries*. London, Croom Helm.

- Gupta, Kanhaya L. and Robert Lensink (1996). "Allocative Efficiency and Financial Deregulation." *International Review of Economics and Finance* 5(1): 35-49.
- Gupta, Kanhaya L. and Robert Lensink (1997). "Financial Repression and Fiscal Policy." *Journal of Policy Modelling* 19(4): 351-373.
- Habibullah, Muzafar Shah and Peter Smith (2001). "Financial Liberalisation and Liquidity Constraints in Myanmar and Nepal: Some Empirical Evidence." *Savings and Development* 25(2): 193-207.
- Handa, Jagadish (2000). *Monetary Economics*. London, Routledge.
- Harris, Richard and Robert Sollis (2003). *Applied Time Series Modelling and Forecasting*. West Sussex, John Wiley and Sons Ltd.
- Harvey, David I., Stephen J. Leybourne and Paul Newbold (2001). "Innovational Outlier Unit Root Tests with an Endogenously Determined Break in Level." *Oxford Bulletin of Economics and Statistics* 63(5): 0305-9049.
- Haslag, Joseph H. and Jahyeong Koo (2003). *Financial Repression, Financial Development and Economic Growth. Working Paper 9902*. Dallas, Federal Reserve Bank of Dallas.
- Hatanaka, Michio (1996). *Time-Series-Based Econometrics: Unit Roots and Cointegrations*. Oxford, Oxford University Press.
- Hayashi, Fumio (1987). "Tests for Liquidity Constraints: A Critical Survey and Some New Observations". In Truman F. Bewley (Eds.), *Advances in Econometrics: Fifth World Congress, Volume II*. Cambridge, UK, Cambridge University Press.
- Henry, Peter B. (2000). "Do Stock Market Liberalization Cause Investment Booms?" *Journal of Financial Economics* 58(1): 301-334.
- Hermes, Niels and Robert Lensink, Eds. (1996). *Financial Development and Economic Growth: Theory and Experiences from Developing Countries*. London, Routledge.
- Hicks, John (1969). *A Theory of Economic Growth*. Oxford, Clarendon Press.
- His Majesty's Government of Nepal (2002a). *Statistical Pocket Book: Nepal*. Kathmandu, Central Bureau of Statistics.
- His Majesty's Government of Nepal (2002b). *Economic Survey 2001-2002*. Kathmandu, Ministry of Finance.

- Huang, Bwo-Nung and Chin Wei Yang (2000). "The Impact of Financial Liberalization on Stock Price Volatility in Emerging Markets." *Journal of Comparative Economics* 28: 321-339.
- Isaksson, Anders (2001). "Financial Liberalization, Foreign Aid, and Capital Mobility: Evidence from 90 Developing Countries." *Journal of International Financial Markets, Institutions and Money* 11: 309-338.
- Jackson, Karl D., Ed. (1999). *Asian Contagion: The Causes and Consequences of a Financial Crisis*. Boulder, Colorado, Westview Press.
- Jaffee, Dwight M. (1989). "Credit Rationing". In Eatwell, John, Murray Milgate and Peter Newman (Eds.), *The New Palgrave: Money*. London, MacMillan.
- Jappelli and Marco Pagano (1994). "Saving, Growth and Liquidity Constraints." *Quarterly Journal of Economics* 109: 83-109.
- Jayaratne, Jith and Philip E. Strahan (1996). "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation." *Quarterly Journal of Economics* 111(3): 639-670.
- Johansen, Soren (1991). "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models." *Econometrica* 59(6): 1551-1580.
- Johansen, Soren (1995). *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models*. Oxford, Oxford University Press.
- Johansen, Soren and Katarina Juselius (1990). "Maximum Likelihood Estimation and Inference on Cointegration- with Applications to the Demand for Money." *Oxford Bulletin of Economics and Statistics* 52(2): 169-210.
- Johansen, Soren, Rocco Mosconi and Bent Nielsen (2000). "Cointegration Analysis in the Presence of Structural Breaks in the Deterministic Trend." *The Econometrics Journal* 3(2): 216-249.
- Johnson, Richard A. and Dean W. Wichern (1992). *Applied Multivariate Statistical Analysis*. New Jersey, Prentice Hall.
- Johnston, R. Barry and V. Sundararajan (1999). *Sequencing Financial Sector Reforms: Country Experiences and Issues*. Washington, D.C., International Monetary Fund.
- Jollief, I.T. (1986). *Principal Component Analysis*. New York, Berlin, Heidelberg, Tokyo, Springer-Verlag.
- Judge, George G., R. Carter Hill, William E. Griffiths, Helmut Lutkepohl and Tsoung-Chao Lee (1988). *Introduction to the Theory and Practice of Econometrics, Second Edition*, John Wiley and Sons, Inc.

- Kahkonen, Juha (1987). "Liberalization Policies and Welfare in a Financially Repressed Economy." *IMF Staff Paper* 34(2): 531-547.
- Kaminsky, Graciela Laura and Sergio L. Schmukler (2003). "Short-Run Pain, Long-Run Gain: The Effects of Financial Liberalization." *IMF Working Paper* WP/03/34.
- Kang, Sung Jin and Yasuyuki Sawada (2000). "Financial Repression and External Openness in an Endogenous Growth Model." *The Journal of International Trade and Economic Development* 9(4): 427-443.
- Kantipur National Daily* (2003). 24 October 2003. Kathmandu.
- Kapur, Basant K. (1992). "Formal and Informal Financial Markets, and the Neo-structuralist Critique of the Financial Liberalisation Strategy in Less Developed Countries." *Journal of Development Economics* 38: 63-77.
- Kawakatsu, Hiroyuki and Matthew R. Morey (1999). "Financial Liberalization and Stock Market Efficiency: An Empirical Examination of Nine Emerging Market Countries." *Journal of Multinational Financial Management* 9(3-4): 353-371.
- Khatriwada, Yuba Raj (1999). "An Overview of Financial Liberalization and Agenda for Further Reforms", *Do We Need Economic Reforms Phase II*, Kathmandu, Institute for Integrated Development Studies.
- Khatriwada, Yuba Raj (2000a). "Emerging Financial Markets in Nepal." *Mirmire* 28(9):179-191.
- Khatriwada, Yuba Raj (2000b). "Reforming Nepalese Financial System Towards New Financial Architecture". *Arunodaya*. Kathmandu.
- King, Robert G. and Ross Levine (1993a). "Finance and Growth: Schumpeter Might be Right." *Quarterly Journal of Economics* 108(3): 717-737.
- King, Robert G. and Ross Levine (1993b). "Finance, Entrepreneurship, and Growth: Theory and Evidence." *Journal of Monetary Economics* 32: 513-542.
- Koutsoyiannis, A. (1977). *Theory of Econometrics: An Introductory Exposition of Econometric Methods, Second Edition*. Hampshire and London, Macmillan Education Ltd.
- Krueger, Anne O. (1986). "Problems of Liberalization". In Armeane M. Choksi and Demetris Papageorgiou (Eds.), *Economic Liberalization in Developing Countries*. Oxford, New York, Basil Blackwell: 15-31.

- Laeven, Luc (2000). "Financial Liberalization and Financial Constraints: Evidence from Panel Data on Emerging Economies." *World Bank Working Paper* WP/00/2467.
- Laeven, Luc (2003). "Does Financial Liberalization Reduce Financing Constraints?" *Financial Management* Spring 2003: 5-34.
- Laurenceson, James and Joseph C.H. Chai (2003). *Financial Reform and Economic Development in China*. Cheltenham, UK, Edward Elgar.
- Lee, Chung H., Ed. (2003). *Financial Liberalisation and the Economic Crisis in Asia*. London and New York, Routledge Curzon and The European Institute of Japanese Studies.
- Lee, Chung H. (2003). "Introduction: Issues and Findings". In Chung H. Lee (Eds.), *Financial Liberalisation and the Economic Crisis in Asia*. London and New York, Routledge Curzon and The European Institute of Japanese Studies: 1-26.
- Lensink, Robert, Niels Hermes and Victor Murinde (1998). "The Effect of Financial Liberalization on Capital Flight in African Economies." *World Development* 26(7): 1349-1368.
- Levine, Ross (1997). "Financial Development and Economic Growth: Views and Agenda." *Journal of Economic Literature* 35: 688-726.
- Levine, Ross (1999). "Law, Finance and Economic Growth." *Journal of Financial Intermediation* 8: 8-35.
- Levine, Ross, Norman Loayza and Thorsten Beck (2000). "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics* 46: 31-77.
- Levine, Ross and Sara Zervos (1998). "Stock Markets, Banks, and Economic Growth." *American Economic Review* 88(3): 537-558.
- Levy, Amnon and Joao Ricardo Faria, (Eds.) (2002). *Economic Growth, Inequality and Migration*. Cheltenham, Edward Elgar.
- Lewis, Jeffrey D. (1992). "Financial Repression and Liberalization in a General Equilibrium Model with Financial Markets." *Journal of Policy Modelling* 14(2): 135-166.
- Lewis, W. Arthur (1955). *The Theory of Economic Growth*. London, George Allen and Unwin Ltd.
- Loayza, Norman, Klaus Schmidt-Hebbel and Luis Servén (2000). "What Drives Private Saving Across the World?" *Review of Economics and Statistics* 82(2): 165-181.

- Lucas, Robert E., Jr. (1988). "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22: 3-42.
- Luintel, Kul Bahadur and Mosahid Khan (1999). "A Quantitative Reassessment of the Finance-Growth Nexus: Evidence from a Multivariate VAR." *Journal of Development Economics* 60: 381-405.
- Lumsdaine, R. and David H. Papell (1997). "Multiple Trend Breaks and the Unit Root Hypothesis." *Review of Economics and Statistics* 79: 212-218.
- Maddala, G.S. (2001). *Introduction to Econometrics*. New York, John Wiley and Sons, Ltd.
- Maddala, G. S. and In-Moo Kim (2003). *Unit Roots, Cointegration, and Structural Change*. Cambridge, Cambridge University Press.
- McAleer, Michael and Les Oxley, Eds. (1999). *Practical Issues in Cointegration Analysis*. Oxford, Blackwell Publishers.
- McKinnon, Ronald I. (1973). *Money and Capital in Economic Development*. Washington, DC, Brookings Institution.
- McKinnon, Ronald I. (1991). *The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy*. Baltimore, Johns Hopkins University Press.
- McKinnon, Ronald I. and Huw Pill (1999). "Exchange-Rate Regimes for Emerging Markets: Moral Hazard and International Overborrowing." *Oxford Review of Economic Policy* 15(3): 19-38.
- McLeod, Ross H. (1998). "The New Era of Financial Fragility". In Ross H. McLeod and Ross Garnaut (Eds.), *East Asia in Crisis: From Being a Miracle to Needing One?* London and New York. Routledge: 333-351.
- McLeod, Ross H. and Ross Garnaut, (Eds.) (1998). *East Asia in Crisis*. London, Routledge.
- Mehran, Hassanali and Bernard Laurens (1997). "Interest Rates: An Approach to Liberalization." *Finance and Development* 34(2): 33-35.
- Mesa-Lago, Carmelo (1997). "Social Welfare Reform in the Context of Economic-Political Liberalization: Latin American Cases." *World Development* 25(4): 497-517.
- Mishkin, Frederic S. (1999). "Lessons from the Tequila Crisis." *Journal of Banking and Finance* 23: 1521-1533.
- Mishkin, Frederic S. (2001). "Financial Policies and the Prevention of Financial Crises in Emerging Market Countries." *NBER Working Paper* 8087.

- Morisset, Jacques (1993). "Does Financial Liberalization Really Improve Private Investment in Developing Countries?" *Journal of Development Economics* 40(1): 133-150.
- Morley, Bruce (2003). "Equities and the Monetary Model of the Exchange Rate: An ARDL Bounds Testing Approach." *Research Paper 2003-2*, University of Aberystwyth, School of Management and Business.
- National Planning Commission (1977). *Employment, Income Distribution and Consumption Patterns in Nepal*. Kathmandu.
- National Planning Commission (2001). *Mid-Term Evaluation of the Ninth Plan (1997-2002)*. Kathmandu.
- Nelson, C. and C. Plosser (1982). "Trends and Random Walks in Macroeconomic Time Series: Some Evidence and Implications." *Journal of Monetary Economics* 10: 139-162.
- Nepal Rastra Bank (1996). *Forty Years of Nepal Rastra Bank*. Kathmandu.
- Nepal Rastra Bank (2001a). *International Monetary Fund and Nepal*. Kathmandu, Research Department.
- Nepal Rastra Bank (2001b). *Banking and Financial Statistics, No.38*. Kathmandu, Banking Operations Department.
- Nepal Rastra Bank (2002a). *Non-Bank Financial Statistics, No. 5*. Kathmandu, Non-Bank Regulation Department.
- Nepal Rastra Bank (2002b). *Economic Report 2001/2002*. Kathmandu, Research Department.
- Nepal Rastra Bank (2003a). *Nepal Rastra Bank Samachar, 48th Anniversary Issue, April 2003*. Kathmandu, Governor's Office.
- Nepal Rastra Bank (2003b). *Nepal Rastra Bank Samachar 28(1), September/October 2003*. Kathmandu, Governor's Office.
- Nepal Rastra Bank (2004). *Macroeconomic Indicators of Nepal, October 2004*.
- Nepal Rastra Bank (2005a). *Commercial Bank Directives*, www.nrb.com.np.
- Nepal Rastra Bank (2005b). *Development Bank Regulation*, www.nrb.org.np.
- Nepal South Asia Centre (1998). *Nepal Human Development Report 1998*. Kathmandu.

- Obstfeld, O. (1998). "The Global Capital Market: Benefactor or Menace?" *Journal of Economic Perspectives* 12(4): 9-30.
- Oxley, Les, F. Scrimgeour and K Fatai (2004). "Energy Consumption, Employment and the Kyoto Protocol in New Zealand: Searching for Causality." www.iemss.org/iemss2004/pdf/kyoto/oxleener.pdf.
- Pagano, Marco (1993). "Financial Markets and Growth: An Overview." *European Economic Review* 37: 613-622.
- Park, Yung Chul (1993). "The Role of Finance in Economic Development in South Korea and Taiwan". In Alberto Giovannini (Eds.), *Finance and Development: Issues and Experience*. Cambridge, New York and Melbourne, Cambridge University Press: 121-150.
- Patrick, Hugh T. (1966). "Financial Development and Economic Growth in Underdeveloped Countries." *Economic Development and Cultural Change* 14: 174-189.
- Perron, Pierre (1988). "Trends and Random Walks in Macroeconomic Time Series: Further Evidence from a New Approach." *Journal of Economic Dynamics and Control* 12: 297-332.
- Perron, Pierre (1989). "The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis." *Econometrica* 57(6): 1361-1401.
- Perron, Pierre (1997). "Further Evidence on Breaking Trend Functions in Macroeconomic Variables." *Journal of Econometrics* 80: 355-385.
- Perron, Pierre and Timothy J. Vogelsang (1992). "Nonstationary and Level Shifts with an Application to Purchasing Power Parity." *Journal of Business and Economic Statistics* 10(3): 301-320.
- Pesaran, M. Hasem and Bahram Pesaran (1997). *Working with Microfit 4.0: Interactive Econometric Analysis*. Oxford, Oxford University Press.
- Pesaran, M. Hasem and Yongcheol Shin (1999). "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis". In S. Strom, A. Holly and P. Diamond (Eds.), *Econometrics and Economic Theory in the 20th Century: The Ranger Frisch Centennial Symposium*. Cambridge, Cambridge University Press. Available at: www.econ.cam.ac.uk/faculty/pesaran/ADL.pdf.
- Pesaran, M. Hasem, Yongcheol Shin and Richard J. Smith (2001). "Bounds Testing Approaches to the Analysis of Level Relationships." *Journal of Applied Econometrics* 16(3): 289-326.

- Pesaran, M. Hasem and Ron P. Smith (1998). "Structural Analysis of Cointegrating VARs." *Journal of Economic Survey* 12(5): 471-505.
- Phillips, P.C.B and Pierre Perron (1988). "Testing for a Unit Root in Time Series Regression." *Biometrika* 75(2): 335-346.
- Pill, Huw and Mahmood Pradhan (1997). "Financial Liberalization in Africa and Asia." *Finance and Development* 34(2): 7-10.
- Pyakuryal, Bishwambher (2002). "Financial Sector Reform in Nepal: Needs and Challenges", *SEACEN Workshop on Macroeconomic Management*, Pokhara, Nepal.
- Rajan, Raghuram G. and Luigi Zingales (1998). "Financial Dependence and Growth." *American Economic Review* 88(3): 559-586.
- Ram, Rati (1999). "Financial Development and Economic Growth: Additional Evidence." *Journal of Development Studies* 35(4): 164-174.
- Ramanathan, Ramu (1995). *Introductory Econometrics with Applications*. Fort Worth, The Dryden Press.
- Rao, Potluri and Roger L. Miller (1971). *Applied Econometrics*. Belmont, California, Wadsworth Publishing Company.
- Reinhart, Carmen M. and Ioannis Tokatlidis (2001). "Before and After Financial Liberalization", www.puaf.umd.edu/faculty/papers/reinhart/FINLIB1.pdf.
- Robinson, Joan (1952). *The Generalization of the General Theory and Other Essays*. London, The McMillan Press Ltd.
- Ross, Peter S. (1994). *Money and Capital Markets: The Financial System in an Increasingly Global Economy*. Boston, MA, Irwin.
- Roubini, Nouriel and Xavier Sala-i-Martin (1992). "Financial Repression and Economic Growth." *Journal of Development Economics* 39: 5-30.
- Roubini, Nouriel and Xavier Sala-i-Martin (1995). "A Growth Model of Inflation, Tax Evasion, and Financial Repression." *Journal of Monetary Economics* 35: 275-301.
- Sarr, Abdourahmane (2000). "Financial Liberalization, Bank Market Structure, and Financial Deepening: An Interest Margin Analysis." *IMF Working Paper* WP/00/38.
- Schmidt-Hebbel, Klaus and Luis Servén (2002). "Financial Liberalization, Saving, and Growth", *Macroeconomic Stability, Financial Markets, and Economic Development*, Mexico.

- Schumpeter, Joseph A. (1934). *The Theory of Economic Development*. Cambridge, MA, Harvard University Press.
- Shaw, Edward S. (1973). *Financial Deepening in Economic Development*. New York, Oxford University Press.
- Shleifer, Andrei (1998). "State versus Private Ownership." *Journal of Economic Perspectives* 12: 133-150.
- Shrestha, Min B. (2005). "ARDL Modelling Approach to Cointegration Test", *Proceedings of the 46th Conference of New Zealand Association of Economists 2005, Paper No. 13*. Christchurch, New Zealand. www.nzae.org.nz/conferences/2005/13-SHRESTHA.PDF.pdf.
- Shrestha, Min B. (2005). "Some Practical Issues in Unit Root Test", *Proceedings of the International Conference in Economics and Finance 2005*: 393-402, Labuan Malaysia.
- Shrestha, Min B. and Khorshed Chowdhury (2005). "A Sequential Procedure for Testing Unit Roots in the Presence of Structural Break in Time Series Data: An Application to Nepalese Data 1970-2004." *International Journal of Applied Econometrics and Quantitative Studies* 2(2): 1-16.
- Shrestha, Min B. and Khorshed Chowdhury (2005). "ARDL Modelling Approach to Testing the Financial Liberalisation Hypothesis." *University of Wollongong, School of Economics and Information Systems, Working Paper No. 05-15*. www.uow.edu.au/commerce/econ/workingpapers/WP05-15.pdf.
- Stiglitz, Joseph E. (1989). "Markets, Market Failures, and Development." *American Economic Review* 79(2): 197-203.
- Temple, Jonathan (1999). "The New Growth Evidence." *Journal of Economic Literature* 37: 112-156.
- Thapa, Govinda Bahadur (2003). Nepalese Financial Sector Reform Programme: Some Notes (Nepali). *Nepal Rastra Bank Samachar (48th Anniversary Issue)*. Kathmandu, Nepal Rastra Bank.
- Theil, Henri (1971). *Principles of Econometrics*. Amsterdam, London, North-Holland Publishing Company.
- Tsurumi, Masayoshi, Ed. (2001). *Financial Big Bang in Asia*. Aldershot, England, Ashgate Publishing Limited.
- UNDP (2002). *Nepal Human Development Report 2001: Poverty Reduction and Governance*. Kathmandu.

- UNDP (2004). *Human Development Report 2004: Cultural Liberty in Today's Diverse World*. hdr.undp.org/reports/global/2004.
- van Wijnbergen, Sweder (1982). "Stagflationary Effects of Monetary Stabilization Policies." *Journal of Development Economics* 10: 133-169.
- van Wijnbergen, Sweder (1983). "Credit Policy, Inflation and Growth in a Financially Repressed Economy." *Journal of Development Economics* 13: 45-65.
- Vokes, Richards (1999). "Financial Sector Development and Corporate Governance", *ADB Workshop*, Kathmandu.
- Wade, Robert (2001). "From 'Miracle' to 'Cronyism': Explaining the Great Asian Slump". In Ha-Joon Chang, Gabriel Palma and D. Hugh Whittaker (Eds.), *Financial Liberalization and the Asian Crisis*. Hampshire and New York, Palgrave.
- Weller, Christian E. (1999). "A Few Observations on Financial Liberalization and Financial Instability." *Review of Radical Political Economics* 31(3): 66-77.
- Whistler, Diana, Kenneth J. White, S. Donna Wong and David Bates (2001). *Shazam User's Reference Manual Version 9*. Vancouver, Canada, Northwest Econometrics, Ltd.
- Williamson, John and Molly Mahar (1998). *A Survey of Financial Liberalization*. Princeton, New Jersey, Princeton University.
- Wilson, Edgar W. (2004). "Notes on the Consequences of Unit Root Processes and Tests for Stationarity", *Presented in the Econometric Workshop held on 1 November 2004*, University of Wollongong, Faculty of Commerce.
- Wilson, Edgar W. and D.P. Chaudhri (2004). "A Perspective on Food Policies Evolution and Poverty in the Indian Republic (1950-2001)." *33rd Conference of Economists*, University of Sydney, 27-30 September 2004..
- Wooldridge, Jeffrey M. (2003). *Introductory Econometrics: A Modern Approach*. Mason, Ohio, Thomson Southwestern.
- World Bank (1989). *World Development Report 1989*. Washington, DC.
- World Bank Group (2005). *Financial Sector Assessment Program*. www1.worldbank.org/finance/html/fsap.htm.
- Wurgler, J (2000). "Financial Markets and the Allocation of Capital." *Journal of Financial Economics* 58: 187-214.
- Wyplosz, Charles (2002). "How Risky is Financial Liberalization in the Developing Countries?" *Comparative Economics* 44(2): 1-26.

- Xu, Zhenhui (2000). "Financial Development, Investment, and Economic Growth." *Economic Enquiry* 38(2): 331-344.
- Zivot, Eric and Donald W. K. Andrews (1992). "Further Evidence on the Great Crash, the Oil-Price Shock, and the Unit-Root Hypotheses." *Journal of Business and Economic Statistics* 10(3): 251-270.