

RELATIONSHIP BETWEEN FINANCIAL SECTOR DEVELOPMENT  
AND ECONOMIC GROWTH AND DEVELOPMENT: AN EMPIRICAL  
STUDY FROM CROSS-SECTION AND PANEL DATA FOR  
SELECTED COUNTRIES

A Thesis

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By

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## **Letter of Recommendation**

“RELATIONSHIP BETWEEN FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC GROWTH AND DEVELOPMENT: AN EMPIRICAL STUDY FROM CROSS-SECTION AND PANEL DATA FOR SELECTED COUNTRIES” has been prepared by Mr. Bhim Prasad Bhurtel under my supervision. I hereby recommend this thesis for examination by the Thesis Committee as a **Partial Fulfillment of the requirements for the Degree of MASTER of ART in ECONOMICS.**

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**Date: July 10, 2010**

## **Letter of Approval**

We certify that the thesis entitled “RELATIONSHIP BETWEEN FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC GROWTH AND DEVELOPMENT: AN EMPIRICAL STUDY FROM CROSS-SECTION AND PANEL DATA FOR SELECTED COUNTRIES” submitted by Mr. Bhim Prasad Bhurtel to the Central Department of Economics, Faculty of Humanities and Social Science, Tribhuvan University, Kirtipur, **in partial fulfillment of the requirements for the Degree of MASTER OF ART in ECONOMICS** has been found satisfactory in scope and quality. Therefore, we accept this thesis as a part of the said degree.

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**Date: August 26, 2010**

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## ACRONYMS

AD= Anno Domini

ARDL= Autoregressive Distributed Lag

BC= Bank Credits

CD=Compact Disk

DC= District of Columbia

FSD=Financial Sector Development

FISIM=Financial Intermediation Service Indirectly Measured

FRB= Federal Reserve Bank

GDP= Gross Domestic Product

GE=Government Expenditure

GLS=Generalized Least Squares

GMM=Generalized Method of Moment

I=Inflation

IMF=International Monetary Fund

IR= Investment Ratio

HC=Human Capital

LL=Liquid Liabilities

Ln= Natural Log

MoF=Ministry of Finance

NRB=Nepal Rastra Bank

OECD= Organization of Economic Cooperation and Development

OLS= Ordinary Least Squares

PC=Private Sector Credit

SAARC= South Asia Association for Regional Cooperation

SBC=Schwarz Bayesian criterion

UK= United Kingdom USA=United States of

America

VAR= Vector Auto-Regression

VECM=Vector Error Correction Model

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

The crucial role of financial sector development in economic growth is a major issue among the scholars, economists, researchers and policymakers around the world. For almost a century, economists have been debating the role of the financial sector development in long run economic growth. A pertinent question frequently asked in the international fora these days goes line the following. Are financial systems simply casinos where the rich people come to place their bets, or do the services provided by the financial system affect the rate of long-run economic growth? Economists disagree about the impact of finance on growth (*Demirgüç-Kunt and Levine, 2008*). Many Development Economists do not even consider financial sector worth discussing. A collection of essays by the *Pioneers of Development Economics*—including three Nobel Prize winners in economics—does not discuss finance (Meier and Seers, 1984). Leading textbooks on economic growth literature also ignore the relationship between financial sector and economic growth (Jones, 1998; Weil, 2005). At the other extreme, Nobel Laureate Merton Miller says “that the financial markets contribute to economic growth is a proposition almost too obvious for serious discussion” (Miller 1998). As a third view, Nobel Laureate Robert Lucas (1988) holds that the role of financial sector in economic growth has been “over-stressed” by the economic growth literature. Resolving this debate will affect the intensity with which scholars, researchers and policymakers attempt to identify and adopt appropriate financial sector policies in economic growth.

Theory in finance-growth relationship provides ambiguous predictions concerning the question of whether financial development exerts a positive and causative impact on long-run economic growth. Theoretical models show that financial instruments, markets and institutions may arise to mitigate the effects of information and transaction costs. In emerging to ameliorate market frictions financial arrangements change the incentives and constraints facing by the economic agents. Thus, financial systems may influence saving rates, investment decisions, technological innovation and hence, the long-run economic growth rates. Even putting aside causal issues, a host of theoretical models illustrate the reductions in financial market frictions that increase expected rates of return and improve risk diversification opportunities could increase or decrease economic growth rates depending on the general equilibrium effects on aggregate saving rates. Furthermore, a comparatively less well developed theoretical literature examines the dynamic interactions between That a modern, efficient financial sector is a powerful contributor to economic growth and development is the researcher thinks something that all of economist, researcher, students and policy makers would instinctively agree on (*Demirgüç-Kunt and Levine, 2008*). The importance of well-functioning financial institutions and their role in promoting and enabling capital accumulation and economic development, has been understood since at least the 19th century if not earlier, and even if one only limits oneself to just the last 50 years the literature on the subject is extensive- indeed, having researched it for this talk, It might almost say exhaustive (*Nugée, 2007*). One of the thoughts that will emerge from this analysis is that, while a modern efficient financial sector is probably a necessary condition for broad-based economic development and prosperity of society and nation, it is certainly not a sufficient condition. No country that wishes to pursue economic growth

and prosperity, and wishes to give its citizens the opportunity to develop to their full potential, can do so in isolation of the global economy and the

international financial sector has a crucial role to play in the interaction of the national and global financial systems. Since Schumpeter (1912) put forward arguments pointing at the productivity and growth enhancing effects of the services provided by a well developed financial sector, a considerable amount of theoretical and empirical literature has emerged. Initially this literature focused on the question whether the financial sector plays a causal role in economic growth or if financial intermediaries merely originate from rapid industrialization. Goldsmith (1969) stressed the propulsive role the financial sector can play in the process of economic growth. Even though this pioneering work broke a ground to change the direction of thinking, the causality question has remained an important issue in the theoretical debate ever since. In the last two decades a wide range of studies has been devoted to huge statistical analysis to elucidate the finance-growth relationship (Levine, 2005). These studies have been able to establish that the financial development and economic growth are clearly related. Yet, the institutional channels is inadequately conceptualized and poorly understood. Even the direction of causality remains unresolved theoretical issues. It might partly be attributed to the lack of a generalized or unifying theory, and partly to the myopic way conventional economics approach the issue. For example, Nobel Prize winner economists disagree about the impact of financial sector on economic growth. Some do not even consider finance worth discussing (Levine, 2003). As already mentioned above, the collection of essays by the *Pioneers of Development Economics* does not discuss finance. On the other hand, extremely opposite view is expressed by some economist "that financial markets contribute to economic growth is a proposition almost too obvious for serious discussion". As a third view hold that the role of finance in economic growth has been "over-stressed" by the economic growth literature. Despite all these differing views, literature on finance growth nexus is growing and more and more economist, researchers and policymakers are

attracting toward it. Thus there is heterogeneity of views about the role of finance in economic growth. The whole array of literature on finance-growth relationship can be divided into two broad categories: 'Supply-leading' hypothesis and 'Demand following' hypothesis. According to 'Supply leading' hypothesis finance is a contributing factor in economic growth. Financial sector transfers resources from the traditional low-growth sector like agriculture and land rents to modern high growth sectors such as industry and service sector and promotes and stimulates entrepreneurial responses in these modern sectors. This implies that creation of financial institutions and the supply of financial services are well in advance of demand for them. The findings of McKinnon (1973), Shaw (1973), King and Levine (1992, 1993a, 1993b, 1993c) support this proposition. Second group of literature, dubbed as 'Demand-following' hypothesis, views finance as dependent upon economic growth, that is, the creation of modern financial institutions and financial services are a response to the demand for these services by investors and savers in the real economy (Patrick 1966). The financial system adapts itself to the financial needs of the real sector and fits in with its autonomous development, playing a relatively passive role in the growth process (Berthelemy and Varoudakis, 1996).

## **1.2 Statement of Problem**

Given the background and below mentioned the objectives, the purpose of the study is to reexamine the nature of finance-growth relationship and provide better empirical insights by analyzing cross-country and panel data of 58 countries over the time period of 1980-2000. First, it studied whether financial development spurs economic growth using standard cross-country regressions and panel regressions. Specifically, the study has been aimed to

answer following research questions;

- What is the degree and direction of association between financial development and economic growth in selected sampled countries?
- What do the cross sectional and panel data empirical evidences say on the financial sector development and economic growth in selected sampled countries?

### **1.3 The objective of the study**

The objectives of the study have been to assess the causal relationship and association between the financial development and economic growth. This study aims at drawing inference about the effectiveness of financial development to the long run economic growth in 58 sampled countries. Although financial development has causal impact on growth, an isolated analysis of causal impact of each of these two on growth would impede a clear identification of the causal links between financial development and growth. Accordingly, the basic objective of this study is to identify the causal links between these two macroeconomic variables in Vector Auto-Regressive (VAR) framework for 58 sampled countries. Accordingly, the specific objectives of the study are as follows:

1. To examine if financial development has causal effects on economic growth of the selected countries under consideration in the sample.
2. To analyze cross sectional and longitudinal i.e. time series empirical evidences of relationship between financial sector development and economic growth of the sampled countries.

## **1.4 Rational of Study**

The purpose of the thesis is to re-examine the nature of finance-growth relationship and provide better empirical insights by analyzing cross-country and panel data of 58 countries over the period of 1980-2000. First, the researcher studied whether financial development spurs economic growth using standard cross-country regressions and panel regressions. Second this study examines the casual relationship between financial development and economic growth using Granger Causality tests. The results indicated a bi-directional causality between finance and growth. The rational of cross sectional and panel data regression comparison. Rationale behind to do so is to compare the both panel and cross-section result simultaneously in the finance growth model.

## **1.5 Outline of Study**

The report of this thesis is structured as follows. The First Chapter is about the introduction which comprises the background of study, statement of the problem and the objective of study. The Chapter Two comprises with the brief review of literature on financial development- economic growth relationship including theoretical as well as methodological aspects. Chapter Three introduces the research methodology that applied in the study including the econometric models that have been used, the different sources



of data that used in the model estimation and different statistical tests. Chapter Four presents the empirical results from the model and findings. Finally the Chapter Five includes summary, conclusions, recommendation and policy implications of study.

## CHAPTER TWO

### REVIEW OF LITERATURE

#### 2.1 The Role of the Financial Sector in History

The finance and the financial sector have existed since the start of recorded human history. It is perhaps a salutary reminder of the unchanging nature of life that the earliest records of proto-historical financial transactions were the payment of taxes to the necessary evil and the omniscient despot, the government. Benjamin Franklin, beyond doubt remarked “Nothing is certain in life except death and taxes” (Nugée, 2007). But it can not be really talked of a financial sector *per se* when these taxes were paid, and recorded, in kind—two cows, 3 bushels of wheat, and etc. The importance of agriculture sector to early societies, and the long lead time between sowing and reaping, made it natural that the needs of the agricultural sector saw the first real financial innovations, with evidence of the granting of credit to Mesopotamian farmers from as long ago as 3000 BC (Richard, 1998). Much of the credit was in the form of seeds lent against an expectation of a share of the future harvest: while this activity certainly required recordkeeping and accounting skills, again it is not really possible to say that this is the beginnings of a true financial sector. But we can say that the concept that loan contracts could enable economic agents to overcome the temporal constraint— to make use, that is, of an “asset” such as seed corn before it has been “earned” at harvest — was certainly established over 5000 years ago.

Moving forward, there are records of banks in Egypt in the Ptolemaic era, and bankers’ cheques and drafts were in existence as early as 250 BC (William and Rouwenhorst, 2005). It has recognizable financial sector developing, and

Egypt's rulers, including of course their famous Queen Cleopatra, made good use of it to maximize their country's economic potential- the wealth of Cleopatran Egypt is a constant refrain in commentaries by late first century BC Roman writers. As moving closer to the modern era, China takes the centre stage. China, which seems to have invented so much that was later "discovered" by the West- such as printing, gunpowder and so on- was the first country to make use of paper money, around 1000 AD, and later in the 13th century it extended the idea into that of fiat money: paper that had value because the government declared that it did rather than because of any explicit backing by gold or other "real" assets (Federal Reserve Bank of Minneapolis, 2008). But again in keeping with so many of their other innovations- somehow China did not make the next leap forward and create genuine securities, paper assets which can be traded between market participants. All of these societies were successful and all of them clearly prospered economically. And it could be mentioned that others like the Romans, whose military and economic successes occurred despite financial arrangements which were really quite primitive in the 1st century BC, certainly less developed than those in contemporary Egypt for example. So the lack of a formal financial sector as generally understood the term today is clearly no barrier to a society's success, either militarily or in the economic sphere. But it is also significant and worth noting that wealth in all these societies was narrowly held and economic development took place at a relatively slow pace: somehow the spark of widespread and rapid economic growth and development across all levels of society eluded them. It is to this, and the role of the financial sector in enabling the creation of the mass prosperity which is the hallmark of the modern era.

## 2.2 The Role of a Modern Financial Sector

It is not particularly profitable to try to identify exactly when the first modern style financial sector came into existence. The process was piece-meal, and moreover developments occurred in a number of centers- Antwerp, Amsterdam, and London- throughout the 17th and 18th centuries. But it can be fairly say that by the first decades of the 19th century, most of the pieces of the jigsaw of a modern-style financial sector were in place, and that the premier financial centre, where the jigsaw was most complete, was undoubtedly London. And what were, indeed what those jigsaw pieces are? Robert Merton and Zvi Bodie, in their classic study of the financial system, identified five main functions of a modern financial sector (Merton and Bodie, 1995). They are;

- (i) Firstly, a mechanism to amalgamate and combine economic resources, thus generating large pools of capital. The importance of capital to economic development has long been understood and if economic agents had to rely entirely on their own capital resources to fund their activity, they would be unable to make large-scale capital investments or therefore grow successful enterprises. A modern financial sector enables a small number of large borrowers to access and put to work the assets of a large number of small savers;
- (ii) Secondly, a mechanism to transfer economic resources across time and space. This enables individuals to separate the life-time pattern

of income (which is typically highest in the period from aged 40 to 60) from that of expenditure (which is typically highest when the individual is young and establishing himself, and old, when he or she is drawing down his savings). It also enables a society as a

whole to allocate resources so that savings flow to the most productive industry or region of the economy;

- (iii) Thirdly, a mechanism to share risk. Risk-sharing benefits both the individual investor, who can spread his investments across many enterprises, and borrowers, who can obtain finance for projects that would be too risky for a single investor but become acceptable when the risk is borne by many. Investment diversification, insurance and hedging are all classic example of risk-sharing;
- (iv) Fourthly, a mechanism to reduce the cost of information. A modern financial system is a huge information exchange- on the price of assets, on the creditworthiness of economic agents, on the prospects of success for a given economic venture. The financial sector processes and analyses this information, and makes it widely and cheaply available to market participants, an essential element of ensuring that society channels its resources into their most efficient usage;
- (v) Lastly, and underpinning all of the above, a mechanism for the clearing and settlement of payments and financial claims, without which the exchange of goods and services would be impossible.

The volume of payments in a modern economy is extraordinary. Just as an example, in the USA alone the annual total value of payments through the financial system approaches \$1,000 trillion, or nearly 100 times of its GDP (Fedwire, 2006). None of this is very controversial, and indeed almost every country in the world has much of this infrastructure in place, at least notionally and at least for the formal sector of the economy, however small that may be in some developing countries. But in some countries, the formal sector of the economy and the role of the financial sector in supporting and enabling it, is indeed extremely small. What is it therefore that makes some

financial sectors vibrant and successful, while others languish and add very little to the national economic development? Empirical studies show that the assets of financial intermediaries and the size of capital markets both tend to be larger in relation to GDP in richer economies than they are in poorer ones. Size, however, is not in itself the main driver of the success of a financial sector. The former Soviet Union had a very large savings bank system, but it contributed little to the development of the Soviet economy. Rather, the critical factor in a well-functioning financial sector is not so much its size as its liquidity. While the size of the financial sector tends to be larger in relation to GDP in richer economies than in poorer ones, turnover in rich economy markets relative to GDP tends to be an order of magnitude larger still— as the figures quoted earlier for payments in the USA show. In a Working Paper by economists Ross Levine and Sara Zervos, published by the World Bank, the authors find that stock market liquidity, as measured by stock trading relative to the size of the market and economy, is positively and significantly correlated with current and future rates of economic growth, capital accumulation and productivity growth, even after controlling for economic and political factors (Ross and Sara, 1996). On the other hand, they also find that stock market size, volatility, and integration *per se* are not robustly linked with growth. This emphasis on liquidity illustrates one of the most important features of a successful financial sector: the ability of participants to access their assets on demand. Critics of financial markets often argue that much—maybe most of this turnover is “speculative froth”, unconnected to the real economy: traders trading with themselves, to the benefit only of themselves. But without this entire turnover, this financial hyperactivity, the financial sector would not be able to absorb and meet the demands of those whose transactions are connected to the real economy. One cannot say that some of the financial activity is good but other parts of it are not. It is the whole which generates the liquidity that modern economies need. Put simply, if people

cannot be sure of being able to get their money out of a financial commitment when they need to, they will be much more reluctant about putting their money into it in the first place. This is not to say that all financial investments have to provide immediate access and daily liquidity. There will always be investors who are able to make a longer term commitment. But investments and markets which do not offer adequate liquidity will struggle to attract finance, and will find that what finance they do attract demands a higher price. So, to Merton and Bodie's five functions of a modern financial sector it can be added a sixth: to be successful, a financial sector must inspire confidence in participants that their assets will at all times be safe and available (Nugee, 2007).

### **2. 3 Importance of Financial Development in Economic Growth**

In a market-led economy, the financial sector has a special and pivotal role, as it mobilizes resources and allocates them to those investments that are capable of generating the highest returns on capital. The better the financial sector can perform this role, the better the economy will perform in the long run. The better the financial sector there will be lesser the friction in the economy and the most of characteristic feature closely attribute to market perfection.

It is true that many Asian countries achieved significant economic growth rates despite shortcomings in their financial systems. However, this growth has not been sustainable, as the Asian financial crisis showed. In fact, growth exacerbated existing problems of financial systems, when external and internal risk management and control systems failed to keep pace with the rapid expansion of credit in the economy. The crisis exposed the weaknesses of regional financial systems, which included the absence of well developed



domestic capital markets and severe deficiencies in financial governance

practices. Together with unsustainable foreign exchange rate policies, these weaknesses were mainly responsible for creating highly leveraged corporate sectors, whose long term domestic investments were financed with short-term foreign-currency denominated bank loans. When the sudden loss of confidence in these economies led to a sharp depreciation of their overvalued currencies, resulting balance sheet problems for banks and corporate sectors then triggered a collapse in output.

## **2.4 The Theoretical Review**

There is a debate over a role of financial systems in economic growth. Some people think that it is a simply casino where the rich come to place their bets. Other thinks that the services provided by the financial system affect the rate of long-run economic growth. Economists disagree about the impact of financial intermediation on economic growth. Many development economists do not even consider finance worth discussing. A collection of essays by the “pioneers of development economics” does not discuss finance (Meier and Seers, 1984) and leading textbooks on economic growth also ignore the financial sector and its role in the economic growth. The second category says “that financial markets contribute to economic growth is a proposition almost too obvious for serious discussion.” The third view holds that the role of finance in economic growth has been “over-stressed” by the growth literature in economic discipline. Resolving this debate will affect the intensity with which researchers and policy makers attempt to identify and adopt appropriate financial sector policies (Demirgüç-Kunt and Levine, 2008).

Alternative views on the links between financial intermediation and economic growth focus on the key functions of financial systems in the

saving-investment-growth nexus. These include acting as an effective conduit;

- Firstly for channeling funds from surplus to deficit units by mobilizing resources and ensuring an efficient transformation of funds into real productive capital.
- Secondly, financial intermediation transforms maturity of the portfolios of savers and investors, while providing sufficient liquidity to the system as the need arises.
- The third function is risks reduction from the system through diversification and techniques of risk sharing and pooling (Nissanke and Stein 2003).

Schumpeter (1934) in 1912 was among the first to point out that banks facilitate technological innovation in their role as financial intermediaries. His argument focuses on the ability of banks to allocate savings more effectively. On the other hand authors like Goldsmith (1969), McKinnon (1973) and Shaw (1973) emphasize the role of financial intermediation in supplying the capital accumulation required in economic growth of the nation. By lowering financial market frictions, domestic savings are increased and foreign capital is attracted. Recent theoretical studies have tried to establish precise mechanism through which financial systems influence economic development. For example, Greenwood and Jovanovic (1990) developed a model in which both financial development and growth are endogenously determined. With respect to the growth effects of financial development, they demonstrated that by pooling idiosyncratic investment risks and eliminating *ex ante* uncertainty about rates of returns, financial development can lead to faster growth. In the model proposed by Bencivenga and Smith (1991), it was

shown that the development of banks increases economic growth by channeling savings to the activity with high productivity but offering risky

and illiquid assets, while allowing individuals to reduce the risk associated with their liquidity needs. In their model, Roubini and Sala-i-Martin (1992) showed that financial repression reduces the productivity of capital and lowers savings, thus hampering growth. The upshot of these theoretical studies is that financial development leads to stronger economic growth. By extending these lines of arguments spatially to cross-border financial transactions and intermediation, it can be shown theoretically that the effects of financial integration on economic growth can be positive. For instance, under certain neoclassical conditions such as the existence of perfectly competitive markets, no information friction and absence of transaction cost and externalities, free capital mobility, would result in funds flowing from low marginal product of capital to high marginal product countries. Since developing countries are believed to have high marginal product of capital due to their being capital poor, it is claimed that financial integration and globalization will help allocate increase resources to developing countries as the capital market works to equalize risk-adjusted marginal products of capital across borders. It is identified five main channels, which foster economic efficiency in an economic and consequently may have beneficial effects on output growth. These are:

- (i) Elimination of transaction costs;
- (ii) Improved allocation of common market capital;
- (iii) Intensified cross-border competitive pressures;
- (iv) Higher efficiency of corporate ownership; and
- (v) Increased output as a result of reduced and converged inflation rates.

Inter-temporal borrowing / lending model as applied to cross-border capital trading has been used to demonstrate that financial globalization/ integration

can be beneficial especially to developing countries. The argument is that as

financial integration allows capital to seek out its highest rewards, it provides developing countries opportunities for higher investment as well as consumption smoothing and insurance against shocks. A similar line of argument based on the model of global portfolio diversification is used to emphasize the welfare gains associated with global risk sharing and shifting which is made possible from portfolio diversification through internationally integrated markets. The model predicts that international asset trading allows each country to hold a globally diversified portfolio of risky investments, resulting in substantial risk reduction through sharing. This is claimed to lead to an increase in world economic growth and national welfare. The following quotation sums up the theoretical predictions about the financial intermediation gains from economic integration. As a result of cross-border transactions, therefore, a nation's resident can enjoy a higher standard of living-a time path of consumption that is higher, better adapted to their particular preferences, and not rigidly tied to the peculiarities of their geographical circumstances-than would otherwise be possible. What is true for the individual nation is equally true for the world as a whole. Cross-border transactions among countries permit a more efficient allocation of world resources than could otherwise occur and thereby increase world consumption possibilities. The theoretical underpinnings of the relationship between financial sector development and economic growth can be traced back to the work of Schumpeter (1912) and, more recently, to Patrick (1966) and Goldsmith (1969). Patrick (1966) focused the causal relationships between finance and growth. Patrick categorizes the possible directions of causality as supply-leading or demand following. Under the supply-leading hypothesis,

the development of financial institutions and their related services induce real investment and economic growth. Financial sector development therefore leads economic growth. Alternatively, under the demand-following hypothesis, the financial sector responds to increasing demand for their

services resulting from the growing real economy. Causality runs from economic growth to financial development. In addition, Patrick proposes his stage of development hypothesis. Under this hypothesis, there is interaction between the two phenomena discussed above; the causality between finance and growth changes over time as the economy develops. At early stages of economic development, financial development is able to spur growth and

innovation as it transfers resources from traditional to modern sectors of the economy and encourages an entrepreneurial response in these modern sectors. However as the process of economic development proceeds, this supply-leading force of financial development gradually weakens, with financial development responding increasingly to output growth, such that the finance-growth relationship eventually becomes entirely demand-following. With his framework, Patrick provided a clear-cut and empirically testable hypothesis. Goldsmith (1969) asserts that the positive effect of financial intermediation on growth could be due to increasing both the efficiency and the volume of investment, even though he assigns a less important role to the latter. He was the first to provide significant empirical evidence about the correlation of finance and growth for a cross-section of countries. By constructing a measure of financial development, Goldsmith broke ground for later empirical research conducted in that field. McKinnon (1973) and Shaw (1973) tried to explain how financial development can affect economic growth based on complementarity and debt-intermediation hypotheses. According to McKinnon-Shaw model, a well-developed financial system mobilizes savings by channeling the small-denomination savings into profitable large-scale investments. These savings might not be available for investment without the participation of financial institutions because mobilizing savings of disparate savers is usually costly due to the existence of information asymmetries and transaction costs. Financial institutions lower the cost of mobilizing savings and also provide attractive



instruments and saving vehicles while offering savers a high degree of liquidity.

In the 1990s, research on the relationship between financial development and long-run growth identifies three specific channels through which the financial sector development might affect economic growth: through its impact on capital accumulation which includes human as well as physical capital, through its impact on efficiency of resource allocation, and through its impact on the rate of technological progress. These effects arise from the intermediation role provided by financial intermediaries;

- First, developed financial system encourage the mobilization of savings from many disparate savers and affect economic growth by improving the efficiency with which those savings are used and increasing the amount of capital and productivity.
- Second, well-developed financial sector can help to screen and monitor borrowers. Better screening and monitoring of borrowers can lead to more efficient resource allocation. Third, developed financial sector help to share risk associated with high-quality investment. Improvement on risk-sharing can enhance savings rates and promote innovation, which will ultimately promote economic growth.

## **2. 5. Review of SAARC Countries**

### **Bangladesh**

Hassan and Islam (2005) in their study examine whether financial development and openness to international trade can play any positive role in reducing poverty in Bangladesh through their growth enhancing effect. The study takes granted that growth reduce poverty and makes econometric test to ascertain whether financial development and trade openness cause growth. Standard Granger-causality test is employed for this purpose. Variables are found first difference stationary without having any co-integrating relationship as reported by Johansen co-integration test. As such Granger-causality test is carried out in first difference VAR. The paper does not find any causal relationship between trade openness and growth, and financial sector development and economic growth. This implies that financial development and trade openness do not reduce poverty through their effect on growth. However, bi-directional causal link evidenced between financial development and trade openness indicates that these two can contribute to poverty reduction directly through their mutual effect on each other.

### **India**

In her study, Chakraborty (2008) examines whether financial development has 'caused' economic growth in India during the period of 1996-2007. The dynamic interactions between the growth of real Gross Domestic Product and indicators of financial sector development are investigated using the concept of Granger Causality after testing for co-integration using both the Engle-Granger and Johansen techniques. The test for co-integration proposed by Gregory and Hansen model reveals that there has been both the level shift

and regime shift in the specifications relating economic growth and financial development. The empirical results obtained by the Johansen method and test suggest the existence of a stable long-run relationship between stock market capitalization, bank credit and growth rate of real GDP. The growth rate of real GDP is also found to be co-integrated with financial depth. However, causality runs from the growth rate of real GDP to stock market capitalization. The sector-wise rates of growth of the industrial and services sectors are found to be co-integrated with the stock market development as well as banking sector development and financial depth. The direction of causality for both the sectors runs from the rate of growth to stock market capitalization. It is also observed that financial depth causes industrial growth and causality runs in both directions between bank credit and industrial growth. Furthermore, volatility in stock prices is co-integrated with each growth rate—of GDP, of industrial sector output and of the service sector output. The article establishes that, in an overall sense, economic growth has 'caused' financial development in India.

Similarly, Kumar and Karmamr (2008) suggested that an efficient financial system is one of the foundations for building sustained economic growth and

an open, contestable economic system. In its best efforts, finance works quietly at the background, but when things go wrong, financial failures are painfully visible. For an economy to attain sustainable growth in the long run, financial sector development is crucial and indispensable. The financial sector traditionally comprises banks, non-bank financial institutions and insurance. But now with financial sector liberalization, foreign direct investment, stock markets, remittances and microfinance institutions have emerged. These segments link up with the real sector to deliver growth. The linkage is established through savings mobilization from surplus units to deficient units. Financial globalization and integration have brought in financial

deepening and strengthening of the financial structure. It affects the growth rate of any economy directly through domestic savings, availability of cheap capital, technology transfer, and development of the domestic financial sector.

## **Nepal**

In their study, Sapkota , Khatri and Aryal(2008) examine the finance growth relationship in Nepal. Financial Institutions have been regarded to be the core area of economic development. However, Nepal could not achieve satisfactory level of economic development and growth due to Maoists

insurgency (1996-2006) and the political instability. The increase in size and number of commercial banks are limited only in the urban areas so that banking services are not accessible to the general public.

Their study examines interaction between financial development and economic growth in Nepal employing correlation analysis, regression analysis, financial ratios and other related theories.

As they found that financial institutions have grown rapidly which has implication in overall economy of the nation. The economic indicators such as GDP, GDP per capita, loan assets of commercial banks, investment, deposit, number of commercial banks, and inflation rate from fiscal year 2001 to 2007 are used for the analysis of their study.

The relevant ratios of commercial banks such as deposit, investment, and profitability are found to be in increasing trend. The growth rate of GDP/capita is however volatile in the study period, the regression result of Deposit/GDP is weakly significant under the study period. The investment growth rate is not significant at all possibly due to the time lag of the effect of investment on the economic development.

## **Pakistan**

In his study, Khan (2008) examines the relationship between financial development and economic growth is examined in an Autoregressive Distributed Lag (ARDL) framework, for Pakistan, utilizing annual data over the period 1961–2005. The main empirical findings suggest that in the long and short run, financial development and investment exerted a positive impact on economic growth. The findings also suggest that in the long-run, real deposit rate is positively related to economic growth but exerted an insignificant impact; however, in the short-run, the relationship between real deposit rate and real output is significant. The long- and short-run responses of the real interest rate are very low as compared to financial development variable, implying that the availability of funds is more important than their cost. To achieve sustainable economic growth, the study suggests a further acceleration of liberalization process in Pakistan with confidence and strong commitment.

## **2.6 Review of Empirical Studies and Methodology**

A large numbers of empirical research findings identified the relationship between financial sector development and economic growth using regression models both time-series and cross-section data. This section discusses some of the empirical studies that examine the finance growth relationship. The focus of most recent empirical studies has been to determine whether there is a significant causal link running from financial development to economic growth.

A study was undertaken by Goldsmith (1969) in which he examined the correlation between financial intermediation and economic growth and

whether the mixture of markets and intermediaries operating in an economy

influences economic growth. He concluded that a rough parallelism can be observed between economic and financial development if periods of several decades are considered and using data from 35 countries for the period 1860 to 1963, he found evidence of a relationship between economic and financial development over long periods, and that periods of rapid economic growth have often been accompanied by an above average rate of financial development. However, he did not take a stand on whether financial development causes economic growth.

Similarly, the application of broad cross-country growth regressions can also be examined to the study of the relation between finance and growth. These studies aggregate economic growth over long periods, a decade or more, and assess the relationship between long-run growth and measures of financial development. King and Levine (1993a, b, c) build on earlier cross-country work by Goldsmith (1969). In particular, King and Levine (1993a,b,c) more than double Goldsmith's (1969) sample of countries, study growth over a 30-year horizon, and systematically control for many possible determinants of economic growth such as initial income, educational attainment, inflation, black market exchange rate, government spending, openness to trade, and

political instability. Furthermore, they examine whether financial development is associated with productivity growth and capital accumulation, which are two channels through which finance may influence economic growth. King and Levine (1993b) study 77 countries over the period 1960–89. To measure financial development, King and Levine focus on equals the size of the financial intermediary sector. It equals the liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. An important weakness with this measure of financial development is that it measures the size of the financial intermediary sector. It may not, however, represent an



accurate proxy for the functioning of the financial system. It may not proxy for how well banks research firms, exert corporate control, or provide risk management services to clients. King and Levine (1993b) experiment with alternative measures of financial development that are designed to gauge who is conducting credit allocation (that is, whether it is banks or the government), and to where the credit is flowing (that is, to the private sector or to the government and state-owned enterprises). They obtain similar results with these alternative indicators of financial development (La Porta et al. 2001).

Similarly, building on Goldsmith's work, Trabelsi (2002) examines the empirical relationship between financial intermediation and long run economic growth. They found that there is a strong positive relationship between different financial development indicators and measures of economic growth. However, Trabelsi (2002), in panel regressions, found no clear positive effect of financial development on economic growth. He tries to explain this paradoxical result by highlighting the importance of the private sector in the allocation of resources by financial markets.

He argues that there is the lack of an innovative entrepreneurial sector in developing countries. In the absence of such a sector, financial development cannot enhance growth substantially. Another influential study by Levine, Loayza and Beck (2000) adopts an alternative approach to examine the issue of causality. They analyze the relationship between financial sector development and economic growth using an instrumental variables approach and dynamic panel data approach. They conclude that there is a very strong connection between the exogenous component of financial intermediary development and long-run economic growth. They find that the exogenous

component of financial development is closely tied to long-run rates of per capita GDP growth and it is not due to simultaneity bias.

Starting from the work of Levine, Loayza and Beck (2000), Favara (2006) has re-evaluated their empirical analysis using an updated dataset and a variety of econometric methods, but the same measures of financial development. First, Favara examines the link between financial development and economic growth using cross-section OLS regressions. He finds that finance and growth are positively correlated. Second, Favara exploits the time-series dimension of the data and employs a panel data estimator that reduces the issue of endogeneity using lagged levels of the regressors as suitable instruments. For most of the specifications considered, he finds that the contribution of financial development to growth is statistically insignificant. Moreover, the magnitude of the estimated effects is very sensitive to different combinations of control variables and sample periods.

Finally, he goes beyond the issue of causality and reexamines the relationship between financial development and growth by allowing this relationship to be heterogeneous across countries. He finds that the effects of financial development differ considerably across countries, with no obvious pattern related to geographic location, the level of economic development or institutional characteristics. Christopoulos and Tsionas (2004) use panel co-integration analysis to examine whether a long run relationship between financial development and economic growth exists for 10 developing countries over the period 1970–2000. Their findings are supportive to a unique co-integrating vector between growth, financial development, investment share, and inflation, and to unidirectional causality from financial

depth to growth. Following Christopoulos and Tsionas (2004), Apergis, Filippidis and Economidou (2007) examines whether a long-run relationship

between financial development and economic growth exists for a dynamic heterogeneous panel of 15 OECD and 50 non-OECD countries over the period 1975–2000. Their findings support the existence of a single long-run equilibrium relation between financial deepening, economic growth and a set of control variables. Further, the evidence points to a bi-directional causality between financial deepening and growth.

## **2.7 The Research Gap**

The empirical literature of the finance-growth relationship till date offers, however, contradictory and antagonistic conclusions. The numbers of possibilities may explain such incompatibility and differences in the findings. This may be due to the sample period and sample size used in course of variation in the empirical studies. It may also be due to the inclusion of the particular countries for the empirical study. The measures of financial sector development and empirical techniques used in the study may make differences in such conflicting findings. And, last but not least, how countries were split into groups may play a crucial role in the observation of differences in the empirical findings across the many studies. In the present study, two particular techniques have been used. Firstly, it has compared the results obtained from different model estimation technique and secondly it has compared the different measures of financial sector development for the same sample. Both the Panel data and the cross-section data have been will be used for the analysis simultaneously and the result will compare. Such comparison is not done in the financial intermediation and economic growth causality till date in the empirical studies. Therefore, is can be claimed that such kind of study adds value to explain the conflicting findings of the previous studies.

## CHAPTER THREE

### RESEARCH METHODOLOGY AND MODEL OF EMPIRICAL STUDY

#### 3.1 Variables and the data Sources:

In this study, the approach of standard growth regressions including the cross-country regressions and panel regressions are undertaken. The data series include 58 countries and the time period from 1980 to 2000. Table no: 1 gives the list of sampled countries. The countries are selected including high income, middle income and low income countries.

**Table No. 1: List of the Sampled Countries**

Australia(HIC*)	Malaysia (UMC)
Bangladesh (LIC)	Mali(LIC)
Benin (LIC)	Mauritius(UMC)
Cameroon (LMC)	Mexico(UMC)
Canada (HIC)	Nepal(LIC)
Chile(UMC)	Netherlands (HIC )
China(LMC)	New Zealand (HIC )
Colombia (LMC)	Niger(LIC)
Costa Rica (UMC)	Norway (HIC )
Denmark (HIC)	Pakistan(LIC)
Dominican Republic (LMC)	Panama(UMC)
Ecuador(LMC)	Paraguay(LMC)
Egypt (LMC)	Philippines(LMC)
El Salvador (LMC)	Portugal(HIC )
Finland (HIC)	Senegal(LIC)
France (HIC )	South Africa
Germany (HIC )	Spain(HIC )
Ghana (LIC)	Sri Lanka(LMC)
Greece (HIC )	Sweden(HIC )
Guatemala	Switzerland(HIC )
Haiti (LIC)	Thailand(LMC)
Honduras (LMC)	Tunisia(LMC)
India (LMC)	Turkey(UMC)
Indonesia(LMC)	UK(HIC )
Ireland (HIC )	USA(HIC )
Italy (HIC )	Uruguay(UMC)
Jamaica (UMC)	Venezuela(UMC)
Japan(HIC )	Zambia(LIC)
Kenya (LIC)	Zimbabwe(LIC)

\*LIC= Least Income, LMC= Lower Middle Income, UMC= Upper Middle Income

and HIC= High Income countries

The basic criteria used for the selection of the sample countries included the following;

1. Inclusive of the high income, middle income and low income countries
2. Inclusive of all continents of the globe
3. Data availability rate is rate is the most important criterion and 98 percent of data are available in the selected sampled countries for the variable examined in this thesis.

Based on the review of empirically estimated augmented growth model, the control variables include initial real GDP per capita (Y80), physical capital measures as the ratio of investment to GDP (IR), human capital measured as the secondary school enrollment as percent of the population aged 15 and above (HC), a measure of government spending, which is the ratio of government spending to GDP (GE), openness measured by imports plus exports relative to GDP (O) and inflation rate (I). The three indicators of financial development has been used: the first one is the liquid liabilities of the financial system (LL), which is defined as currency plus demand and interest bearing liabilities of bank and non-bank financial intermediaries divided by GDP (M3/GDP); the second indicator is bank credit (BC), defined

as credit by deposit money banks to the private sector divided by GDP and the third one is private sector credit (*PC*) which equals the value of credits by deposit money banks and other financial institutions to the private sector divided by GDP. The data for real GDP per capita growth, investment, government expenditure and export plus imports are obtained from Penn World Table 6.2. Data for human capital are used from Barro and Lee (2000) while data for financial variables and inflation rate are from World Development Indicators, 2007 of IMF online data service. The Table 2 shows the list of proxy variables with abbreviations and definitions and corresponding data sources

**Table No. 2: List of Proxy Variable with Abbreviations and Definitions and Data Sources**

Proxy Variables	Abbreviations	Variable Definition	Data source
Log of GDP Per capita	Lny	Log of GDP per capita expressed in 2000 international Dollar	Penn World Table 6.2
Investment	I	Real domestic investment as share of real GDP	Penn World Table 6.2
Human Capital	DC	Secondary School enrollment as percent of the population aged 15 and above	Barro and Lee (2000)
Government expenditure	GE	Government expenditure share in GDP	Penn World Table 6.2
Openness	O	Import plus exports relative to GDP	Penn World Table 6.2
Inflation	Inf	Annual percent change in CPI	IMF online data source
Bank Credit	BC	Credit by deposit money banks to the private sector divided by GDP	World Development Indicators 2007.
Private sector credit	PC	Credit by deposit money banks and other financial institutions to the private sector divided by GDP.	World Development Indicators 2007.
Liquid Liabilities	LL	Currency plus demand and interest bearing liabilities of bank and non-bank financial intermediaries divided by GDP (M3/GDP).	World Development Indicators 2007.

### 3.2 Cross-Sectional Data Analysis

The study started with the analysis by exploiting cross-sectional variation in the total data sets. Given the various theories on the relationship between financial development and economic growth and augmented Solow model of by Mankiw, Romer and Weil in 1992 which derives the estimated equation from the neoclassical growth model relating the growth rate of real GDP to investment as a ration of GDP and growth rate of population, we use the following basic policy and institutions augmented cross-country growth



model to examine the relationship between finance and growth: In line with previous empirical studies, we will estimate the base regression for cross-sectional evidence and financial variables will be augmented in the subsequent specification. The estimations were carried out using ordinary least squares (OLS) and the standard errors were computed using the White robust procedure.

The equation (1) uses only the averages of the variables, and therefore omits a lot of information. The other disadvantage of equation (1) is that if it contains one or more endogenous variables, the estimates will be biased. Also, the equation does not take into account the problem of heterogeneity among countries, which introduces an omitted variable bias. Most but not all of these shortcomings are solved by using a panel data model.

### **3.3 Panel Data Analysis**

#### **3.3.1 Panel Unit Root Tests**

Before embarking on panel data analysis, the researcher first checked whether the variables in the model are stationary or non-stationary, i.e., whether the individual series contain unit roots. According to Eviews 5.1, there are 5 methods of panel unit tests: Levin-Lin and Chu (LLC); Breitung; Im, Pesaran and Shin (IPS), ADF types of test, as well as Hadri Test. However, only the IPS test is used in this analysis. The choice of panel unit root test follows Apergis et.al. (2007), who claim that it is less restrictive and more powerful compared to other panel unit root tests.

### **3.3.2 Panel Co-integration Analysis**

After the order of the stationary has been identified, the researcher has been tested for the existence of a co-integration relationship among non-stationary variables. A common practice to test whether the group of non-stationary variables are co-integrated or not is carry out Johansen co-integration test. Johansen test for testing co-integration non-stationary variables has also been used.

### **3.3.3 Panel Estimation**

Given our all variables are not co-integrated; there is no need to adopt co-integration procedure because the use of co-integration is only valid for variables that are non-stationary before differencing. If so, it has been used Generalized Least Squares (GLS), and a Vector Auto-regression (VAR) framework to investigate the nature of relationship financial development and economic growth. The GLS utilizes the cross-sectional weights for correcting cross-sectional heteroskedasticity where as the GMM approach takes differences to eliminate country-specific effects and thereby remove omitted variable bias, and solves the issue of endogeneity using lagged levels of the regressors as suitable instruments. This approach is taken from Levine et al. (2000). The VAR approach has been employed to capture the long-run relationship between the variables.

### **3.3.4 Granger Causality Test**

GLS and GMM estimator provide relevant information only on the dependence of the one variable on the other variables. This relationship does

not necessarily imply causation. The Granger causality test procedure is adopted to fill the gap in asserting whether causality exists between financial development and economic growth. The following regression models are used to conduct Granger causality test (Islam, 1998).

### 3.4 The Model

$$g_{yi} = \alpha + \sum_{k=1}^{k=n} \beta_k (X_i^k) + FDI_i + \varepsilon_i \dots\dots\dots 1$$

Where,

$g$  = Mean growth rate of real GDP per capita for the period 1980 to 2000.

$X$  = a vector of control variables averaged for the period 1980 to 2000.

$FDI$  = Financial development indicator for the period 1980 to 2000.

$\varepsilon$  = error term

$$\ln Y_{i,t} = \ln Y_{i,t-1} + \sum_{j=1}^n X_{i,t}^j + FDI_{i,t} + \varepsilon_{i,t} \dots\dots\dots 2$$

Where,

$Y_{i,t}$  is the log of real GDO per capita,

$FDI_{i,t}$  is a measure of financial development indicator

$X_{i,t}$  is a set of control variables, and

$\varepsilon_{i,t}$  is the error term.

$$\ln Y_{i,t} = \ln Y_{i,t-1} + FDI_{i,t-1} + \sum_{j=1}^n X_{i,t-1}^j + \varepsilon_{i,t}$$

$$FDI_{i,t} = FDI_{i,t-1} + \ln Y_{i,t-1} + \sum_{j=1}^n X_{i,t-1}^j + \varepsilon_{i,t}$$

.....4

.....3

Where,  $X_{t-1}$  is the vector of control variables in the model.

## **CHAPTER FOUR EMPERICAL FINDINGS**

### **4.1 Summary of Statistics and Facts**

Summary statistics for all variables used in the study are given in Table no. 3. These statistics refer to a panel with observations kept in yearly basis. The table suggests that the most of variability occurring in the data between-countries, yet some variables including the two indicators of financial development also have large within-country variations. Over the sample period from 1980 to 2000, growth rates in the sampled countries have been between -18.5 percent to around 18.5 percent and the mean growth rate for all the countries is 1.7. The average investment in the sample countries was as low as 2.3 percent and as high as 43.8 percent. Similarly, the mean value of the human capital development for all the countries is 5.9. Inflation rate averaged around 13.8 percent and public spending averaged 19.0 percent of GDP. There is large variation in accumulation of human capital measured as the average years of schooling aged 15 and over.

**Table No. 3: Summary of Statistics and Facts**

Variables	Mean	St. Deviations	Maximum	Minimum		Observations	
GY	Overall	1.72	4.03	18.53	-18.47	N*T	1218
	Between		3.49			N	58
	Within		2.31			T	21
HC	Overall	5.94	2.83	12.05	0.54	N*T	1218
	Between		2.66			N	58
	Within		1.01			T	21
IR	Overall	15.84	7.47	43.81	2.26	N*T	1218
	Between		6.12			N	58
	Within		4.14			T	21
O	Overall	57.32	32.29	228.87	12.22	N*T	1218
	Between		26.28			N	58
	Within		14.23			T	21
INF	Overall	13.80	18.98	183.31	-14.90	N*T	1218
	Between		16.77			N	58
	Within		21.45			T	21
GE	Overall	19.04	5.98	40.09	7.20	N*T	1218
	Between		4.56			N	58
	Within		2.54			T	21
BC	Overall	67.12	47.36	311.42	-19.14	N*T	1218
	Between		35.41			N	58
	Within		16.68			T	21
PC	Overall	50.59	40.84	232.20	0.56	N*T	1218
	Between		32.98			N	58
	Within		23.41			T	21
LL	Overall	52.24	32.92	244.78	6.55	N*T	1218
	Between		20.41			N	58
	Within		10.76			T	21

The pair-wise correlations matrix for the variables of interest is reported in Table No. 4, using both cross-section and panel data. All signs are as expected: the growth rate of GDP per capita is positively correlated with the

level of human and physical capital, the degree of openness and all indicators of financial development. In addition, the level of investment is, on average, positively correlated with the level of financial development, whereas a high level of inflation appears to correlate negatively with the size of the financial sector.

**Table No. 4: Pair-Wise Correlation Matrices**

<b>(a) Cross Section Data</b>										
Variables	GY	HC	IR	O	INF	GE	BC	PC	LL	
GY	1.00									
HC	0.22	1.00								
IR	0.49	0.71	1.00							
O	0.20	0.05	0.08	1.00						
INF	-0.35	-0.21	-0.31	-0.20	1.00					
GE	0.10	-0.15	-0.08	0.01	0.02	1.00				
BC	0.33	0.61	0.59	0.04	-0.39	-0.17	1.00			
PC	0.37	0.67	0.56	0.09	-0.47	-0.16	0.95	1.00		
LL	0.40	0.53	0.59	0.09	-0.39	-0.21	0.92	0.88	1.00	

  

<b>(b) Panel Data</b>										
Variables	GY	HC	IR	O	INF	GE	BC	PC	LL	
GY	1.00									
HC	0.10	1.00								
IR	0.25	0.65	1.00							
O	0.14	0.09	0.11	1.00						
INF	-0.21	-0.16	-0.24	-0.16	1.00					
GE	-0.01	-0.15	-0.08	-0.02	-0.02	1.00				
BC	0.10	0.58	0.51	0.07	-0.30	-0.16	1.00			
PC	0.13	0.63	0.57	0.15	-0.36	-0.16	0.94	1.00		
LL	0.16	0.51	0.51	0.13	-0.29	-0.20	0.88	0.84	1.00	

## 4.2 Cross-Sectional Results

The pair-wise correlations matrix for the variables under consideration is given in Table no. 4, using both cross-section and panel data format. All signs

are as expected: the growth rate of GDP per capita is positively correlated with the level of human and physical capital, the degree of openness and all indicators of financial development. In addition, the level of investment, on an average is positively correlated with the level of financial development, whereas a high level of inflation appeared to correlate negatively with the size of the financial sector development.

able No. 5: Result of the Regression of Cross Section Model

Independent Variables:	Dependent Variable: Growth			
	Regression no.1	Regression no.2	Regression no.3	Regression no.4
Constant	1.910 (2.56)	1.680 (2.78)	1.54 (2.7)	0.077 (3.25)
lnY80	-0.0003* (0.00001)	-0.0003* (0.00006)	-0.0003* (0.00006)	-0.0003* (0.00004)
Population Growth	-1.006* (0.321)	-0.99* (0.33)	-0.99* (0.328)	-0.90* (0.308)
Log of Investment as % of RGDP	1.57* (0.517)	1.56* (0.55)	1.49* (0.48)	1.41* (0.48)
Log of Human Capital	1.06* (0.465)	-1.02* (0.47)	0.99** (0.48)	0.91** (0.48)
log of Measure of Openness	0.810** (0.38)	0.82** (0.39)	0.84** (0.38)	0.792** (0.33)
Log of Government Expenditure	-0.280 (0.54)	-0.270 (0.54)	-0.260 (0.54)	-0.130 (0.58)
Inflation	-0.05* (0.017)	-0.04* (0.02)	-0.05* (0.016)	-0.04* (0.01)
Log of Bank Credit		0.070 (0.45)		
Log of Private Credit			0.148 (0.39)	
Log of Liquid Liabilities				0.490 (0.51)
Adjusted R-squared	0.549	0.541	0.541	0.548
SER	1.130	1.129	1.138	1.133
F-Statistic and p-values in the parentheses for overall Significance of coefficients	10.91 (0.000)	11.245 (0.000)	11.142 (0.000)	10.142 (0.000)
D-W Statistic	1.990	2.001	2.001	1.890
No obs	58	58	58	58



Table No. 5 reveals the basic result of cross-country regressions analysis. The first regression uses a mean real GDP growth rate as a dependent variable and real GDP per capita in 1980 and control variables as independent variables. This basic model performs well: these six variables statistically explain 54.9 % of the cross-country variation in economic growth over the

1980-2000 sampled years, and all of the variables have expected sign and five of them are statistically significant. Regressions no. 2 to no. 4 in Table 5 summarizes the results of cross-country model augmented by three financial variables, one at a time. The coefficients on financial variables are in expected direction of relationship however they are not statistically significant. Thus, the researcher does not find any evidences of positive impact of financial development on economic growth in cross- sectional model in given data set.

### 4.3 Panel Data Evidence

#### 4.3.1 Panel Unit Test Results

The results from the panel unit root test are presented in Table 6 and are reported with a trend. The null hypothesis of unit root has been tested for each variable. All the variables are tested both in levels and in first differences. The results unit root tests indicate that the variables Lny, O, GE, PC and LL have stochastic trend when the variables are taken in levels, but when first differences are used, they are stationary. However, other variables HC, IR, INF and BC are stationary in levels.

**Table No. 6: Panel Unit Root Tests**

Variables	Level	First Difference
Lny	-2.211	-9.302*
HC	-19.746*	-
IR	-5.527*	-
O	0.387	-16.345*
INF	-10.363*	-
GE	-1.755	-20.128*
BC	-3.88*	-
PC	2.287	-11.983*
LL	-1.309	-17.011*

Note: \* denotes significance at 1 percent level.

### 4.3.2 Panel Co-integration Results

The co-integration test results for non-stationary variables (HC, Lny, GE, PC and BC) are reported in the Table No.7. The calculated test statistic can not reject the null hypothesis of absence of co-integration at 5 percent for these variables. This provides the support that there is no need to estimate vector error correction model (VECM).

**Table No. 7: Johansen Co-integration Tests**

Hypothesized no of Co-integration Relations	Trace Statistic			
	PC	p-Value	BC	p-value
None	42.4381	0.1468	33.3548	0.5373
At most 1	18.8583	0.5031	14.5235	0.81
At most 2	4.74675	0.8351	7.21527	0.5528
At most 3	0.01903	0.8902	1.055	0.3044

Trace test indicates no co-integration at the 0.05 level

### 4.3.3 Panel Estimation Results

The results of the GLS with cross-section weights and fixed effects are reported in Table no. 8. The table also includes p-values for the coefficient

estimates. The estimates associated with the financial variables are positive and highly significant, suggesting that the exogenous component of financial development accelerates economic growth. The remaining control variables except human capital also are with correct sign and high significance. However, human capital variable is insignificant. Based on the estimation results of the fixed effects, the adjusted R<sup>2</sup> is around 0.31, which shows that approximately 31 percent variation in growth is explained by the independent variables.

**Table No.8: Results of GLS Regression (Cross-section Weights)**

<b>Independent Variables:</b>	<b>Dependent Variable: Growth</b>					
	<b>(1)</b>		<b>(2)</b>		<b>(3)</b>	
	<b>Coefficients</b>	<b>p-values</b>	<b>Coefficients</b>	<b>p-values</b>	<b>Coefficients</b>	<b>p-values</b>
<b>-</b>						
<b>Investment</b>	0.1528	0.0000	0.1774	0.0000	0.1459	0.0000
<b>Human Capital</b>	0.1535	0.3768	0.2630	0.1340	0.1636	0.3527
<b>Openness</b>	0.0248	0.0007	0.0295	0.0000	0.0214	0.0039
<b>Government Expenditure</b>	-0.1869	0.0000	-0.2051	0.0000	-0.1769	0.0000
<b>Inflation</b>	-0.0641	0.0000	-0.0659	0.0000	-0.0601	0.0000
<b>Bank Credit</b>	0.0253	0.0000				0.0005
<b>Private Credit</b>			0.0331	0.0000		
<b>Liquid Liabilities</b>					0.0216	0.0005
<b>Adjusted R-squared</b>	0.306		0.317		0.293251	
<b>SER</b>	3.466		3.453		3.503784	
<b>D-W Statistic</b>	2.047		2.047		2.053487	
<b>No obs</b>	1160		1160		1160	

Note: p-values are reported in parentheses.

Table No. 9 reports the estimates based on GMM estimators. The table presents the results from *system* dynamic-panel estimation described above. The GMM estimates suggest that financial development exerts a positive causal impact on economic growth. All the three financial variables are significant at the 0.05 significance level. The table also shows that other regressors also enter significantly with the expected signs.

**Table No. 9: Results of GMM Estimates**

<b>Independent Variables:</b>	<b>GMM Estimates</b>					
	<b>(1)</b>		<b>(2)</b>		<b>(3)</b>	
	<b>Coefficients</b>	<b>p-values</b>	<b>Coefficients</b>	<b>p-values</b>	<b>Coefficients</b>	<b>p-values</b>
<b>Investment</b>	0.0329	0.0000	0.0281	0.0005	0.0732	0.0000
<b>Human Capital</b>	1.3253	0.0000	1.3120	0.0000	1.3331	0.0000
<b>Openness</b>	0.0280	0.0000	0.0313	0.0000	0.0220	0.0000
<b>Government Expenditure</b>	-0.2828	0.0000	-0.2782	0.0000	-0.2913	0.0000
<b>Inflation</b>	-0.0368	0.0000	-0.0374	0.0000	-0.0324	0.0000
<b>Bank Credit</b>	0.0034	0.0084				
<b>Private Credit</b>			0.0053	0.01401		
<b>Liquid Liabilities</b>					0.0502	0.0000

Note: p-values are reported in parentheses.

Table No. 10 reports the results based on VAR (1). The estimated coefficients of the financial variables are all positive and statistically significant. It implies that lags of financial development contribute to growth. However, the coefficients on the lags of growth are not statistically significant. It implies that there is evidence of long run relationship working from financial sector development to growth.

Table No. 10: Results of Vector Autoregression Estimates (Only results of two equations are reported)

Independent Variables:	Dependent Variable: $\Delta \ln y_t$			Dependent Variable: Finance		
	(1)	(2)	(3)	$\Delta BC_t$	$\Delta PC_t$	$\Delta LL_t$
$\Delta \ln y_{t-1}$	0.2214 [ 7.06057]	0.2218 [ 7.10261]	0.2211 [ 7.07473]	3.5249 [0.19542]	4.1688 [ 0.49089]	8.0183 [ 0.67128]
$\Delta IR_{t-1}$	0.0191 [ 1.95671]	0.0226 [ 2.45207]	0.0197 [ 2.15927]	0.3508 [ 6.24483]	0.1571 [ 3.85086]	0.1275 [ 3.64640]
$\Delta \ln f_{t-1}$	-0.0056 [-2.03939]	-0.0063 [-2.31131]	-0.0056 [-2.05941]	-0.0207 [-1.30556]	-0.0113 [-0.94474]	-0.0152 [-1.46379]
$\Delta HC_{t-1}$	0.0087 [ 0.35542]	0.0105 [ 0.45079]	0.0117 [ 0.50517]	0.0347 [ 0.24773]	-0.0195 [-0.19044]	-0.1339 [-1.50920]
$\Delta GE_{t-1}$	0.0306 [ 0.80048]	0.0315 [ 0.82343]	0.0300 [ 0.78250]	-0.0878 [-0.39875]	0.0739 [ 0.43725]	0.0343 [ 0.23454]
$\Delta O_{t-1}$	0.0377 [ 4.39955]	0.0378 [ 4.41448]	0.0377 [ 4.40037]	-0.0194 [-0.39352]	0.0567 [ 1.49907]	0.0005 [ 0.01376]
$\Delta BC_{t-1}$	0.0499 [ 2.35183]			0.9657 [ 118.476]		
$\Delta PC_{t-1}$		0.0115 [2.45304]			0.0576 [ 1.64870]	
$\Delta LL_{t-1}$			0.0057 [ 1.70951]			-0.0177 [-0.57589]

Note: t-statistics are reported in [ ].

#### **4.3.4 Granger Causality Test Results**

Table No. 11 presents the results of the Granger-causality test. In general, the Granger-causality test results are critically reliant on the chosen lag lengths. Given this sensitivity, the Schwarz Bayesian criterion (SBC) has been used to determine the proper lag structures in this study. The optimal lag length suggested by SBC is one. The results suggest that causality run from FSD to growth, with feedback at the 5 percent level, the findings, thus, confirms that there is a bi-directional Granger-causal relationship between FSD and growth.



Table No. 11: Granger Causality Tests

Direction of causality		F-value	p-value	Null Hypothesis
FSD $\Rightarrow$ Growth	BC	5.20894	0.000	BC does no Granger cause growth
	PC	4.24367	0.0045	PC does no Granger cause growth
	LL	6.00507	0.0001	LL does no Granger cause growth
Growth $\Rightarrow$ FSD	BC	20.5153	0.0227	Growth does no Granger cause BC
	PC	8.10009	0.0397	Growth does no Granger cause PC
	LL	14.6674	0.0163	Growth does no Granger cause LL

# CHAPTER FIVE

## SUMMARY CONCLUSION AND RECOMENDATIONS

### 5.1 Summary

The researcher has focused in this study on the important, but controversial, issue of whether financial development matters in economic growth in the long run. It briefly reviewed the relevant theoretical and empirical literature before embarking the empirical study of the issue under consideration in this thesis. Review of theoretical literature suggests that financial sector development affect economic growth through three specific channels: first- through its impact on capital accumulation, second- through its impact on allocation of scarce resource in efficient manner and lastly- through its impact on the rate of technological innovations and adoption of technological changes in the economies. However, previous empirical studies provide conflicting findings. This study tried to re-examine the nature of the finance-growth nexus from a number of different perspectives. First, it used both cross-section and panel data analysis simultaneously. Use of panel data controls for possible endogeneity of the regressors and for the possible omitted variables bias in model specifications. It can handle the entity fixed effects and time fixed effects. Second, it employed a variety of econometric methods: cross-sectional model, Generalized Least Squares, VAR model and Granger Causality tests for the same set of data under consideration. Third, it employed various measures of financial development to capture the variety of different channels through which financial development can affect growth and vice versa. Fourth, it included more control variables borrowed from the relevant literature control for possible omitted variable bias. Finally, it used a large and heterogeneous sample of 58 countries consisting high income

middle income and low income countries including many countries representing most of the continent of the globe for the period of 1980-2000. Combination of both developed and developing countries help to exploit longer time series properties of the panel as well as cross-sectional data under consider.

## **5.2 Conclusions**

The result of this thesis indicates a positive and statistically significant relation between financial sector development and economic growth for all different financial indicators. Second, the study used Granger-causality technique to test for the causal relationship between financial development and economic growth. The results of study support the existence of a strong bi-directional causality between the two variables under consideration. The results also indicate that human capital, investment share, and international trade have positive impact on economic growth while government spending exhibits a negative effect on economic growth. Inflation as an indicator of macroeconomic stability is statistically insignificant.

It is found that financial sector development causes economic growth in return economic development also causes financial sector development in long run. Similarly, the empirical evidences showed that there is strong negative relationship between financial sector development and inflation.

### 5.3 Recommendations

The followings are recommendations of the empirical study;

1. The empirical study has been found that there is the positive relationship between the financial sector development and the economic growth in general. So, it is strongly recommended to develop the well functioning financial system in general. For this purpose, financial sector reform may be a useful and possible option.
2. Likewise, Global Competitiveness Index, the indicator of measuring the global competitiveness situation administered by World Economic Forum suggests financial market sophistication and soundness of banking system are necessary prerequisites for economic growth. So, it is recommended to develop the financial market sophistication and soundness of banking and financial system.
3. The empirical evidences have been shown that there is strong negative relationship between financial sector development and inflation. Therefore it is recommended that inflation containments measures should be applied for the smooth financial sector development which ultimately contributes to economic growth in long run.
4. The study strongly recommends for the further research. The area for further research are as follows:
  - I. The findings of the study certainly point out to the need for further research on the topic of finance-growth relationship. Collection of

better-quality and more extensive indicators of financial development, better econometric technique to incorporate non-linear relationship, and extension of the model to incorporate important inter-linkages between domestic and international financial system would be a fresh start for further research. Moreover, much remains to be done on examining are the

determinants of financial sector development and how precisely it can be made financial sector development contributing to the pro-poor growth and distribution in society.

- II. Nepal is one of the perennially low income countries in the world where the financial sector development and the financial intermediation dramatically are growing in last decade where as the economic growth rate is remained very dismal even in the time of astonishing financial sector development (Bhurtel, 2010). Economic Survey 2008/9 revealed that figure of Financial Intermediation Service Indirectly Measured (FISIM) is nearly doubled from 12026 millions to 27568 millions on an average of 9.5% growth rate during the period 2000/1-2008/9 (MoF, 2009). However during the same time period, real GDP growth rate remained on an average of 2.5 percent (World Bank, 2009). This clearly shows the financial sector development and economic growth relationship paradox in case of Nepal. Therefore this study strongly recommends in investigating the nature of financial sector development and its impact on the economic growth in case of Nepal particularly.

## **5.4 Policy Implications**

The empirical study found that there is the positive relationship between the financial sector development and the economic growth in general. The financial sector development and the economic growth are bi-directional casual to each other. Based on this simple research, it is quite hard to derive policy implications. However, it can safely be concludes that policies that foster macroeconomic stability and control of inflation, increasing openness

in the economy, investing more in human capital and channeling government spending on social overhead capital and promoting smooth financial sector development definitely matters to a great extent for long run economic growth.

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