Chapter 1
Introduction

1.1 General Background

Stock market development has an important role to play in economic development. Shahbaz and his friends (2008) argue that stock market development is an important wheel for economic growth as there is a long-run relationship between stock market development and economic growth. Stock market development has the direct impact in corporate finance and economic development.

Gerald (2006) states that stock market development is important because financial intermediation supports the investment process by mobilizing household and foreign savings for investment by firms. According to him, it ensures that these funds are allocated to the most productive use and spreading risk and providing liquidity so that firms can operate the new capacity efficiently. A growing body of literature has affirmed the importance of financial system to economic growth. Similarly Mishkin (2001) states that a well-developed financial system promotes investment by identifying and financing lucrative business opportunities, mobilizing savings, allocating resources efficiently, helping diversify risks and facilitating the exchange of goods and services

Financial markets, especially stock markets, have grown considerably in developed and developing countries over the last two decades. Claessens, et al (2004) states that several factors have aided in their growth, importantly improved macroeconomic fundamentals, such as more monetary stability and higher economic growth. General economic and specific capital markets reforms, including privatization of state-owned enterprises, financial liberalization, and an improved institutional framework for investors, have further encouraged capital markets development

From the view point of Sharpe, et al (1999), stock market is a mechanism through which the transaction of financial assets with life span of greater than one year takes place. Financial assets may take different forms ranging from the long-term government bonds to ordinary shares of various companies. Stock market is a very

important constituent of capital market where the shares of various firms are traded Trading of the shares may take place in two different forms of stock market. When the issuing firm sells its shares to the investors, the transaction is said to have taken place in the primary market but when already issued shares of firms are traded among investors the transaction is said to have taken place in the secondary market.

Stock markets are very important because they play a significant role in the economy by channeling investment where it is needed and can be put to best (Liberman and Fergusson, 1998). The stock market is working as the channel through which the public savings are channelized to industrial and business enterprises. Mobilization of such resources for investment is certainly a necessary condition for economic take off, but quality of their allocation to various investment projects is an important factor for growth. This is precisely what an efficient stock market does to the economy (Berthelemy and Varoudakis, 1996).

Earlier research emphasized on the role of the banking sector in the economic growth of nation. In the past decade, the world stock markets surged, and emerging markets accounted for a large amount of this boom (Demirguc-Kunt and Levine (1996a). Recent research has begun to focus on the linkages between the stock markets and economic development. New theoretical work shows how stock market development might boost long-run economic growth and new empirical evidence supports this view. For example, Demirguc-Kunt and Levine (1996a), Singh (1997), and Levine and Zervos (1998) find that stock market development is playing an important role in predicting future economic growth.

In Nepal, the development and growth of stock markets have been widespread in recent times. Although there is only one stock exchange in Nepal, its performance has been remarkable. Despite the size and illiquid nature of stock market, its continued existence and development could have important implications for economic activity. For instance, Pardy (1992) has noted that even in less developed countries capital markets are able to mobilize domestic savings and able to allocate funds more efficiently. Thus stock markets can play a role in inducing economic growth in less developed country like Nepal by channeling investment where it needed from public. Mobilization of such resources to various sectors certainly helps in economic

development and growth. Stock market development has assumed a developmental role in global economics and finance because of their impact they have exerted in corporate finance and economic activity. The role of financial system is considered to be the key to economic growth (Neupane, et. al. 2006).

Paudel (2005) states that stock markets, due to their liquidity, enable firms to acquire much needed capital quickly, hence facilitating capital allocation, investment and growth. Stock market activity is thus rapidly playing an important role in helping to determine the level of economic activities in most economies.

Tuladhar (1996) states that financial markets are a catalyst in the development of the country's economy. The study further added that developed economies have highly sophisticated financial institutions. Over the past decade, many developing economies have established capital markets as they moved towards more liberal economic policies. These emerging markets have shown extraordinary growth with very high volatility, which have attracted many investors into these markets.

This study attempts to dig out the empirical evidence in the context of Nepal regarding the role of stock market development on economic growth.

1.2 Statement of Problem

In the last two decades, the link between financial intermediation and economic growth is a subject of greater interest among academics, policy makers and economists around the world. There have been attempts to empirically assess the relationship of stock market and economic growth. The link between stock market and growth has varied both in methods and results. There exist two controversies in the predictions.

Adjasi and Biekpe (2005) found a significant positive impact of stock market development on economic growth in countries classified as upper middle-income economies. In the same way, Chen et al (2004) elaborated the nexus between stock returns and output growth and concluded that the rate of stock returns is a leading indicator of output growth. Arestic *et al* (2001) using time-series on five

industrialized countries also indicate that stock markets play a role in growth. Various studies such as Spears, (1991); Atje and Jovanovic, (1993); Comincioli, (1996); Levine and Zervos, (1998); Filer et al (1999); Demirguc-Kunt (1994); Tuncer and Alovsat, (2001) has supported the view that Stock markets development promote economic growth. With well-functional financial sector or banking sector, stock markets can give a big boost to economic development (Rousseau & Wachtel, 2000; Beck & Levine, 2003). Bahadur and Neupane (2006) concluded that stock markets fluctuations predicted the future growth of an economy and causality is found in real variables.

There are also alternate views about the role that the stock markets play in economic growth. Apart from the view that stock markets may be having no real effect on growth, there are theoretical constructs that show that stock market development may actually hurt economic growth. For instance, Stiglitz (1985, 1994), Shleifer and Vishny (1986), Bencivenga and Smith (1991) and Bhide (1993) note that stock markets can actually harm economic growth. They argue that due to their liquidity, stock markets may hurt growth since savings rates may reduce due to externalities in capital accumulation. Diffuse ownership may also negatively affect corporate governance and invariably the performance of listed firms, thus impeding the growth of stock markets.

Despite of alternative views, empirical works continue to show largely some degree of positive relationship between stock markets and growth. These studies are largely based on developed countries. Only few studies have been conducted in context of Nepalese stock market, and those conducted studies did not show clear conclusion regarding its impact of stock market development on economy. Yadhav (2002) reveals that firms with higher investment have higher saving and higher capital formation. Though this study may be important in other cases it does not establish a clear conclusion between the stock market development and economic growth. Similarly Wagle (2002) also carried out the study on trends of saving, investment and capital formation in Nepal, but this study fails to provide any specific link between saving, investment and capital formation with stock market development. Similarly Sindhurakar (2004) has carried out the study on relationship between the stock market and economic growth without analyzing the causality test. Hence there is a need to

analyze the relation between stock market development and economic growth with context of Nepal.

This study specifically deals with the following issues:

1. What is the relationship between the Gross Domestic Product (GDP) and government investment, government expenses, foreign aid and foreign direct investment?
2. Is there any relationship between the market capitalization and Gross Domestic Product (GDP)?
3. What is the impact of concentration ratio on economic growth of a nation?
4. What is the significance of liquidity on economic growth? What is its impact in capital market?
5. Is there any co-integration between the stock development index and economic growth?
6. Is there any Granger causality between the stock development index and economic growth?
7. Is the Levine and Zerovos model valid in underdeveloped nation like Nepal?
8. Can the small group of investors manipulate a Nepalese capital market easily?
9. How can the government able to develop the stock market in coming days?

There are no unanimous views on the relationship between the stock market development and economic development. One group of study argues that stock market does not help in economic development of a nation while the other group argues that it helps in economic development. However, empirical investigations of the link between financial development in general and stock markets and growth in particular have been relatively limited. Various empirical researches have suggested a possible connection between stock market development and economic growth, but are far from definitive.

1.3 Objective of Study

The main objective of this study is to examine the impact of stock market development in the economic development and growth of the nation in context to Nepal. The specific objectives of the study are as follows.

1. To conduct the empirical analysis of stock market by investigating the link between stock markets and economic growth.
2. To further analyze the link based on set of different variables of economic indicators and stock market indicators.
3. To examine the importance of liquidity for the economic growth.
4. To analyze the impact of firm concentration ratio on economic growth.
5. To examine the validity of model of Levine and Zervo's study on stock market in developing nation like Nepal.
6. To determine and analyze the co-integration and causality between the stock market development index and economic growth.

1.4 Organization of the study

This study has been examined into five chapters. Chapter one being the introductory part covers the general background, stating of problems, objective of study, limitation of study and organization of the study. Second chapter deals with review of available literature. It includes review of books, reports, journals, previous thesis etc. Third chapter explains the research methodology used in the study. It includes research design, source of data, population and samples, methods for data analysis etc. The fourth, which is important chapter of the study, will include presentation and analysis of data. The last chapter (Fifth) summarizes the conclusions and offers suggestions for further improvement. A bibliography and appendices will be attached at the end of the study.

CHAPTER 2
CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

This chapter is devoted to the conceptual framework and review of past studies on different aspects of economic growth and stock market development. It comprises of four sections: section one describes the conceptual framework, which is basically concerned with the concept and theories of economic growth and stock market. Section two presents the review of empirical works on stock market development and economic growth, and section three is concerned with review of Nepalese studies capital markets and economic growth. Finally, section four is devoted to concluding remarks.

2.1 Conceptual Framework

2.1.1 Economic Growth

Economic growth can be defined as the increase in the economy's output over the time period (Shapiro, 2001). Growth in economic output can occur with an increase in input factors that is more equipment is purchased and more workers enter the labor force, which is known as capital accumulation. This is the approach that China is currently taking to feed its growth. However, growth based on capital accumulation is subject to diminishing returns; additional increases in input result in smaller and smaller increases in output. Alternatively, growth can occur with an increase in the economic output per person, that is, an increase in productivity. Increased productivity is the key to raising the standard of living and to sustained growth.

The political, social and military system of the nation depends upon economic success. No area of economic is today more vital or more controversial than macroeconomics. Macro economies are an important subject because a nation can affect its economic performance by it. Macroeconomic policies such as the level and structure of taxation or expenditure of a nation can speed or slow its economic growth.

There are four objectives that are central to evaluate macro economic performance. They are output, employment, price and foreign sector.

1. Output

The ultimate yardstick of a country economic success is its ability to generate a high level of production of economic goods and services for its population. The most comprehensive measure of the total quantity of production in an economy is the Gross National Product (GNP). GNP is the measure of market value of all goods and services. GNP can be measured in current or actual market price, which is called nominal GNP.

An economy has certain amount of labor, capital and land available to it at a given time. Converting these inputs with available technology will allow a maximum sustainable level of output to be produced.

2. Employments

The next major objective of macroeconomic policy is high employment and low employment. The labor force includes all persons either employed or unemployed but excludes those without work who are not looking for jobs. Over the period of 1929, there has been a gentle increase in the fraction of the adult population that leads to increase in the labor in the world. Unemployment reached epidemic proportions in the Great Depression of the 1930s, with high work forced idle.

3. Stable Price

The third macroeconomic objective is to ensure stable prices with free markets. This objective contains two parts. Price stability denotes that the overall price level does not rise or fall rapidly. Societies always prefer stable price because prices are a yardstick whereby economic values are measured. When the economic yardstick changes quickly during periods of rapidly changing prices, contracts and other economic agreements become distorted, and the price system tends to become less valuable. The second half of the objective of stable prices, maintenance of free

markets, means that market forces should determine prices and quantities by supply and demand, to the maximum possible extent. The objective of stable prices with free markets is pursued in the most countries today because many people believe that stable prices determined by free markets allow the economy to allocate resources efficiently and in a way that is responsive to individual tastes.

4. Foreign Economic Policy

The final goal of the policy is to promote a proper foreign economic policy. This aim has become increasingly important when the nations of the globe have become more closely tied by the international trade and finance. If there is no any foreign economic policy then economies are open. They import and export goods and services, borrow or lend money to foreigners, imitate foreign technologies or sell their inventions abroad, people travel to all part of the world for business and pleasure etc.

The economic growth is consists of set of controlled variables that are suspected to be associated with economic growth. These variables selected for the study include government expenses, public investment, public development aid, inflations and foreign direct investment.

There are many growth theories of economic growth. Two views can be considered as important. (1) The neoclassical growth theory which considers population growth and technical progress to be the determinants of economic growth with capital accumulation simply determining the capital to labor ratio in the steady state; and (2) the Keynesian growth theory which focuses particularly on the role of investment (and saving) as a component of aggregate demand. In light of these conventional determinants of economic growth a number of economists have explored the multiple sources of growth and measure the separate contributions of as many as possible of them over specific past periods and for various countries. Among those sources of growth are: capital accumulation, labor supply, output, and other aggregate variables.

There are three reasons for the economic growth. They are (i) conquest and settlements (ii) international trade and capital movements and (iii) technological and institutional innovations. Conquest and settlement provided natural resources,

additional land for population relocation, and new species of plants and animals to expand the food supply. International trade and capital movement lead to development of financial institutions such as banking, accountancy, foreign exchange and credit markets that enabled more rapid economic development.

2.1.2 Capital Markets

Financial markets play a fundamental role in the economic development of a country. They play as an intermediary link in facilitating the flow of funds from savers to investors. By providing an institutional mechanism for mobilizing domestic savings and efficiently channeling them into productive investments, they lower the cost of capital to investors and accelerate economic growth of the country. Financial intermediation between borrowers and savers is done by commercial banks. This credit market enables debt financing for investments. An alternative method of intermediation is through equity financing. This is only possible through the development of capital markets.

Capital markets, which deal with securities such as stocks and bonds, are associated with financial resource mobilization on a long-term basis. By raising capital directly from the public, they lower the cost of capital. The capital markets allow for wider ownership among the public, by distributing risks and wealth amongst smaller investors. They provide investors for making investment choices which suit their own preferences of risk and returns based on available information. As such, capital markets help the economy to generate more savings and productive investments. A basic feature of an efficient capital market is constant liquidity, that is, an easy mechanism for entry and exit by investors. This requires sufficient volume and size of transactions in the market.

Efficient capital markets allow investors to buy properly priced assets in firms, which are more productive, offering higher returns and allow firms to acquire capital at cost corresponding with the riskiness of those firms. Financial sector development is a lengthy, evolutionary process. It is an indicator of the state of economic development of the country, since an efficient well-developed financial market is only possible when there is substantial income generation and investment opportunities.

There are three types of capital market efficiency. Operating efficiency results from having minimal transactions costs. Operating efficiency reduces the cost of trading. Information efficiency means that capital markets reflect all information available to investors and allocative efficiency results from the process of providing funds to corporations that provide the highest rates of return in the economy. Allocative efficiency means that more productive firms will be able to acquire capital at lower costs than less productive firms. Thus, capital markets supply the investment funds needed by corporations.

2.1.3 Historical Perspective of Nepalese Securities Market

The history of capital market in Nepal dates back to 1936 in which year the shares of Biratnagar Jute Mills Ltd. were floated. In 1937, Tejarath was set up to facilitate loans to the government employees and was converted into Nepal Bank Ltd. HMG Nepal introduced the Company Act in 1964 and the first issue of government bonds made in the same year through Nepal Rastra Bank to collect the developmental expenditures. It carried 6 percent rate of interest and had the maturity period of five years (Shrestha, 2038). HMG Nepal announced the Industrial Policy in 1974 and under this policy an institution named Securities Marketing Center (SMC) was established to deal in government securities-development bonds and national savings bonds, and corporate securities of few companies. The government has the virtual monopoly over the security market. Then Securities Exchange Center (SEC) was established in 1976 with an objective of facilitating and promoting the growth of capital market. It was the only capital market institution in Nepal. Securities Exchange Act came into force in 1984. Since then, SEC started to operate under this act. The purpose of this act was to provide systematic and favorable market environment for securities ensuring and protecting the interest of individuals and institutional investors as well as to increase the public participation in various firms and companies (Gurung, 1999).

SEC had provided facilities to trade the government securities and few of corporate securities like shares and debentures. Only the shares of 10 companies were listed in SEC and there was involvement of no broker and dealer in the securities market. So, SEC itself was undertaking the job of brokering, underwriting, managing public issue,

market making for government bonds and other financial services (NEPSE 1998). Apart from this, there was the absence of effective secondary market to ensure liquidity to the securities. The interim government (1990/91) initiated financial reform program and two indirect investment vehicles-Citizen's Investment Fund and NIDC Capital Markets Ltd.-were established with the collective investment schemes in the corporate sector. Then, due to the world whim of privatization and economic liberalization, the operation of SEC was felt to change to make it compatible with the changing economic system. As a result, Government of Nepal brought change in the structure of SEC by dividing it into two distinct entities-Securities Board, Nepal (SEBO/N) and Nepal Stock Exchange Ltd. (NEPSE) at the policy level in 1993. Since then they are operating as the main constituents of securities market in Nepal. SEBO/N was established on June 7, 1993 with its mission to facilitate the orderly development of a dynamic and competitive capital market and maintain its credibility, fairness, efficiency, transparency and responsiveness under the Securities Exchange Act 1983. It is an apex regulator of the securities market in Nepal. It registers the securities and approves the public issues. Moreover, SEBO frames the policies and programs required to monitor the securities market, provides license to operate stock exchange business and stock brokers and supervises and monitors the stock exchange operations.

2.2 Review of Empirical Works

This section concerns with review of important empirical works, concerning stock market development and economic growth starting from 1873 to 2008. Some important studies and their finding are presented in tabular form in chronological order. The review of literature is undertaken in three sections. The first section focuses on the review of empirical works carried out before 1990s with their major findings. Similarly, the second section deals with the review of studies carried out during 1990s and finally third section deal with the review of studies during 2000.

2.2.1 Review of Empirical Works before 1990s

During nineteenth and twentieth century, Bagehot (1873) and Schumpeter (1912) had focused on the constructive assistance of financial sector to economic growth. In the study the direction of causality between the higher growth in financial sector and country's economic growth rate was not clear (Robinson, 1952 and Locus, 1988). In the wake of a large body of empirical evidence, considerable studies have made on modeling and understanding the strong positive linkages between real and financial development. Much of this study has followed the "functional" approach in the analysis of such linkages. The major findings of the studies conducted before 1990s are presented in the table 2.1 and 2.2.

The "finance-led growth" hypothesis postulates the "supply-leading" relationship between financial and economic developments. It is argued that the existence of financial sector and financial intermediations in channeling the limited resources from surplus units to deficit units would provide efficient allocation resources by leading the other economic sectors in their growth process. Indeed, a number of studies argued that the development of financial sector has significantly promoted economic development (Schumpeter, 1912). The study argued that the technological innovation is the force underlying long-run economic growth.

Table: 2.1
Description of Empirical Studies from 1873 to 1969

Study	Area	Major Findings
Bagehot (1873)	A description of money market with currency monopoly.	Constructive assistance of financial sector to economic growth.
Schumpeter (1912)	The theory of economic development	Technological innovation is the force underlying long-run economic growth.
Robinson (1952)	The Generalization of the General Theory, in The Rate of Interest and Other Essays	There is a two-way causal relationship between financial development and economic performance.
Goldsmith (1969)	Association between levels of financial development with economic growth.	A significant association between the level of financial development and economic growth.

Robinson (1952), on the other hand, concluded that the economic growth creates a demand for various types of financial services to which the financial system responds. Goldsmith (1969) reported a significant association between the level of financial

development (defined as financial intermediary assets divided by GDP) and economic growth. The study however recognized that there is no possibility of establishing the confidence for the direction of the causal mechanisms.

The earlier studies on international stock market linkages focused on the identification of short-term benefits of international portfolio diversification. The study of Levy and Sarnat (1970) and Solnik (1974), examined the short-term correlations of returns across national markets and pointed out the existence of substantial markets have high possibilities to diversify the risk internationally.

McKinnon (1973) provided the evidences that liberalization of financial markets allows financial deepening which reflects an increasing use of financial intermediation by savers and investors and the monetization of the economy, which allows efficient flow of resources among people, and institutions over time. This encourages savings and reduces constraint on capital accumulation and improves in allocating efficiency of investment by transferring capital from less productive to more productive sectors.

Another group of studies concentrated on examining financial links among stock markets by using either bivariate or multivariate co-integration methodology. Taylor and Tonks (1989) were the first to apply bivariate co-integration on the UK and U.S. markets to test the importance of the abolition of foreign exchange controls in 1979. Furthermore, the empirical evidence was not conclusive, while a strong empirical causal relationship among the banking system, stock market development and economic performance was hardly established. Financial development is considered as a means to economic growth through various channels. An important role of financial intermediaries is to provide liquidity to individual investors (Diamond and Dybvig 1983). Similarly study of Stiglitz and Weiss, (1981); and Cho (1986) concluded that the returns do not increase as the interest rate to borrowers rises.

Table: 2.2

Description of Empirical Studies from 1981 to 1989

Study	Area	Major Findings
Shiller (1981)	Do stock prices move too much to Be Justified by Subsequent Changes in Dividends?	Price movements cannot be simply justified by changes in fundamentals.
Stiglitz and Weiss (1981)	Credit rationing in markets with imperfect information	Due to stagnant bank returns, increase in interest rate does not increase its return.
Diamond and Dybvig (1983)	A simple example, Federal Reserve Bank of Richmond.	An important role of intermediaries is to provide liquidity to individual investors.
Romer (1986)	Increasing returns and long run growth	Increase in productivity will cause economic growth.
Cho (1986)	Inefficiencies from financial liberalization in the absence of well-functioning equity markets.	Returns do not increase as interest rate rises.
Lucas (1988)	On the mechanics of economic development.	Not clear findings about the causality between financial sector and economic growth.
Taylor and Tonks (1989)	The internationalization of stock markets and the abolition of U.K. exchange control	There is multivariate co-integration on UK and US market.

At the theoretical level, the study of stock markets and growth gave new impetus with analyses of the design of optimal financial contracts under asymmetric information in dynamic general equilibrium models. The study of Bernanke and Gertler (1989) concluded that the evolution of the financial system led to financial contract which emerged to solve the problems of moral hazard. The study concluded that when the firms are in need of external finance face a cost minimization problem, which they must solve by issuing different forms of financial contracts under different circumstances.

2.2.2 Review of Empirical Works during 1990s

Stock exchanges are expected to increase the amount of savings channeled to corporate sector. Some evidence can be found in the work of Greenwood and Jovanovich (1990). Furthermore, the study concluded that the stock markets play an important role in allocation of capital to corporate sector that in turn stimulates real economic activity. Many countries are facing financial constraints particularly developing countries, where bank loans are restricted to some favorable groups of companies and personage investors. This limitation can also reflect constraints in credit markets (Mirakhor and Villanueva, 1990). The description of studies during 1990s are presented in table 2.3, 2.4, 2.5, 2.6, and 2.7.

Table: 2.3
Description of Empirical Studies from 1990 to 1991

Study	Area	Major Findings
Mirakhor and Villanueva (1990)	Market integration and investment barriers in emerging equity markets.	There are high constraints in credit markets.
Greenwood and Jovanovich (1990)	Financial development, growth, and the distribution of income.	Financial markets and financial institutions can affect capital accumulation.
Vishny (1990)	The stock market and investment.	Stock market on an aggregate level does not predict the future investment.
Levine (1991)	Stock markets, growth, and tax policy.	Strong positive relationship between stock market liquidity, productivity improvements and capital accumulations.
Bencivenga and Smith (1991)	Financial intermediation and endogenous growth.	Financial agents can affect savings decisions by reducing liquidity costs.

The ability of financial intermediaries to offer profitable investments enhances savers' confidence and attracts additional savings. The efficient operation of financial intermediaries leads to output growth and generates additional demand for deposits and financial services (Greenwood and Jovanovic, 1990). Financial institutions can

affect agents' savings decisions by reducing liquidity costs and offering greater opportunities for diversifying risks (Bencivenga and Smith, 1991). Portfolio diversification, through the stock market, may have an additional growth effect by encouraging specialization of production (Saint-Paul, 1992).

In addition, some studies concluded that stock markets could improve corporate governance by alleviating the principal-agent problem between the owners and managers (Jensen and Murphy, 1990). By contrast, other studies pointed out that stock market development could have negative effects by facilitating hostile counter-productive takeovers (Vishny, 1990). Moreover, some argue that takeover threats could hassle managers that discourage long-term investment, and therefore lead to inefficient allocation of resources (Singh and Weiss, 1998). Furthermore, some assert that stock markets, by providing profit incentives, are more effective than banks in information acquisition and dissemination and therefore could enhance quality of investment and thus stimulate growth (Holmstrom and Tirole, 1994). On the contrary, some others believe that banks are superior to stock markets in that they could monitor firms' investment and management at a lower cost. They contend that in reality, due to dispersed stock ownership, individual investors are relatively small and they neither have the ability nor the incentives to acquire the costly yet necessary information for achieving efficient resource allocation (Bhide, 1993; Singh, 1993).

Contrary to traditional view, there are evidences that support the hypothesis that there exist long-run correlation between stock market development and economic growth. But in literature the testing of this hypothesis is rare for developing countries. However, Pardy (1992) in his seminal work has argued that in less developed countries capital markets are able to mobilize domestic savings and allocate funds more efficiently. Spears (1991) reported that in the early stages of development, financial intermediation induced economic growth. Demirguc-Kunt (1994) has supported the view that stock markets promote economic growth.

A number of subsequent studies adopted the growth regression framework in which the average growth rate in per capita output across countries is regressed on a set of variables controlling for initial conditions and country characteristics as well as measures of financial market development (King and Levine, 1993a). The study further analyzes the relationship between financial development and real GDP per capita growth, the rate of physical capital accumulation, and increases in efficiency over the period from 1960-89. The study measured the financial development by using the financial depth ratio (ratio of liquid liabilities to GDP), the level of banking, the ratio of credit issued to non-financial private firms to total credit and the ratio of credit issued to private firms to GDP. The study revealed that higher levels of financial development are positively associated with faster rates of economic growth and that the level of financial development is a good indicator of future growth prospects.

Robert Barro (1990) reported that in the case of US, stock market variables and stock returns, can largely explain the subsequent aggregate investments. On the contrary, Morck et al (1990) suggested that in the US, the stock market on an aggregate level is not much of a predictor of future investment. Meanwhile, a study by Galeotti and Schiantarelli (1994), based on quarterly aggregate data from the non-financial corporate sector in the US, revealed that investment decisions are significantly affected by stock price fluctuations, regardless whether the variation is due to fads or due to changes in fundamentals. On the other hand, firm- level studies typically showed that there is a very limited effect of the stock market on investment (Abel and Blanchard, 1986; Morck et al., 1990; Blanchard et al., 1993).

Table: 2.4
Description of Empirical Studies from 1992 to 1993

Study	Area	Major Findings
Saint-Paul (1992)	Financial markets and economic development.	Stock markets have additional growth effect.
Pardy (1992)	Institutional reform in emerging securities markets.	In less develops countries the capial maket are able to mobilize domestic savings.
King and Levene (1993)	Finance and growth	Rate of physical capital accumulation has increased in efficiency over the period from 1960 to 1989.
Atje, and Jovanovic, (1993)	Stock market and development	Significant correlation between the stock markets and economic growth.
Pagano (1993)	Financial market and growth.	Financial growth can affect the rate of economic growth by altering productivity growth and the efficiency of capital.
Bhide (1993)	The hidden cost of stock market liquidity.	Highly liquid market may reduce the shareholders incentives to monitor managers.

Atje and Jovanovic (1993) concluded that there is a large effect of stock markets on economic growth but no relationship for bank lending on economic growth. Alternatively, Harris (1997) argued that the Atje and Jovanovic results are not supported by empirical results. Harris analyzed data for forty-nine countries over the period from 1980-91 for the growth in GDP per unit of effective labor, investment as a percent of GDP, the growth of total employed labor and the total value of shares traded on the stock market as a percent of GDP. The study reported that the level of stock market activity has little explanatory power in the sample of developing countries and weak explanatory power for the sample of developed countries. The study of Stiglitz (1994) provided the evidence that when the stock prices is determined by publicly available information then it help investors make better investment decisions. Better investment decisions mean better allocation of funds among corporations and, as a result, a higher rate of economic growth. In efficient

capital markets, prices reflect all available information, and this reduces the need for expensive and painstaking efforts to obtain additional information.

Table: 2.5
Description of Empirical Studies for 1995 AD

Study	Area	Major Findings
Bencivenga, Smith,and Starr (1995)	Transactions costs, technological choice and endogenous growth.	Theoretical predications on strong connections between stock market liquidity and fast growth.
Bencivenga et al. (1995)	Transactions costs, technological choice and endogenous growth	Enhanced stock market liquidity reduces the disincentives for investing in long duration and higher return projects since investors can easily sell their stake in the project.
Longin and Solnik (1995)	Is the correlation in international equity returns constant: 1960-199*0?*	By applying sophisticated techniques they found evidence of significant linkages between the stock markets around the world.

Hamao et al. (1990), Koch and Koch (1991), Roll (1992), Longin and Solnik (1995), used more sophisticated econometric techniques to measure cross-country correlations, and found evidence of significant linkages between stock markets around the world. Some other studies focused on the evolution of linkages of emerging capital markets. Studies such as Harvey (1995), but particularly Bekaert and Harvey (1995), examined one period returns and the conditional means and variances of one period returns by examining a one factor asset pricing model. The study concluded that the expected returns in a country are affected by their covariance with country' returns. The study further concluded that if the market was perfectly integrated then only covariance counted, while if the market was completely segmented then the variance was the relevant measure of market risk. Bekaert and Harvey (1995) used a conditional regime-switching model to account for periods when national markets were segmented from world capital markets and when they became integrated later in the sample.

Table: 2.6

Description of Empirical Studies for 1996 AD

Study	Area	Major Findings
Demetriades and Hussein (1996)	Does financial development cause economic growth?	There is bi-directionality and reverse causality between financial development and economic development.
Diamond (1996)	Financial intermediation as delegated monitoring: A simple example, federal reserve bank of Richmond	Financial intermediaries encourage highly productivity firms reducing informational asymmetries and costs.
Levine and Zervos (1996)	Stock market development and long-run growth.	Equity market activity is positively correlated measures of real economic activity.
Benchivenga, Smith and Starr (1996)	Equity markets, transaction costs and capital accumulation.	Positive role of liquidity provided by stock exchanges on real asset investments.

There are not much empirical studies investigating causal relationships between stock exchange and economic growth. One study worth mentioning here belongs to Levine and Zervos (1996). The study applied regression analysis to the data compiled from 41 countries for the years 1976 through 1993 to see the relationships between financial deepening and economic growth. One of the financial deepening indicators used in the analysis was the level of development of stock exchange measured by a composite index, liquidity and diversification indicators. Economic growth indicator selected, on the other hand, was the real growth rate in per capita GDP. Levine and Zervos reported a very strong positive correlation between stock market development and economic growth. The most interesting aspect of this study was the decrease in the statistical significance of other financial deepening variables after stock market development index was included in regression equation. The study concluded with the proof that stock market development is more influential than other financial deepening indicators on the growth of the economy.

Traditional growth theorists believed that there is no correlation between stock market development and economic growth because of the presence of level effect not the rate effect. Singh (1997) contended that stock markets are not necessary institutions for achieving high levels of economic development. The study focused on the rapid

growth of stock markets in the liberalization process in developing countries over the 1980s and 1990s and argued that financial liberalization (making the financial system more fragile) is not likely to enhance long-term growth. Singh and Weis (1999) viewed stock market as a agent that harm economic development due to their susceptibility to market failure, which is often manifest in the volatile nature of stock markets in many developing countries. The traditional assessment model of stock prices and the wealth effect provided hypothetical explanation for stock prices to be proceeded as an indicator of output (Comincioli, 1996). According to wealth effect, however, changes in stock prices cause the variation in the real economy.

Although empirical tests of the relationship between financial development and economic development are not consistent, the bulk of the evidence supports a relationship between financial development and economic development. Demetriades and Hussein (1996) found the evidence of both bi-directionality and reverse causality by using unit root tests, co-integration tests and vector auto-regression tests of causality. The study concluded that financial development causes economic growth, economic growth causes financial system development, and in some cases, the causality is in both directions. As independent variables, the study has used the ratio of bank deposit liabilities to nominal GDP and the ratio of bank claims on the private sector to nominal GDP. The dependent variable is real GDP per capita in local currency terms. Rajan and Zingales (1998) predicted the average annual real growth of value added in an industry in the United Stated over the period from 1980-90. As predictor variables the study used the proportion of investments funded with external financing and the ratio of capital spending to net property, plant, and equipment. Industries were further divided into young and old companies. This process helped them to differentiate industries that were more or less dependent on external financing. The study wanted to test if financially dependent industries perform better in countries that have more developed financial sectors. The study used the ratio of domestic credit plus stock market capitalization to GDP, the ratio of domestic credit to the private sector relative to GDP, and an index of accounting transparency. They study revealed that the financial development facilitates economic development by providing cheaper funds to growing industries.

Table: 2.7

Description of Empirical Studies from 1997 to 1999 AD

Study	Area	Major Findings
Harris (1997)	Stock markets and development	Level of stock market activity has little explanatory power in the developing country sample and weak explanatory power for the developed country sample.
Singh (1997) and Weis (1999)	Financial liberalization, stock markets and economic development.	Stock market is a agent that harm economic development due to their susceptibility to market failure.
Raguraman and Zingales (1998)	Financial dependence and growth.	Financial developmet facilitates economic development by providing cheaper funds to growing industries.
Levine and Zervos (1998)	Stock markets, banks and economic growth.	Strong and statistically significant relationship between the stock and GDP.
Luitel and Khan (1999)	A quantitative reassessment of the finance-growth nexus.	Financial development is very supportive to economic development.

The development of endogenous growth theory in recent years has offered the opportunity to define and explain the link between financial development and economic growth. The study of Pagano (1993) and Levine (1997) concluded that the financial development could affect the rate of economic growth by altering productivity growth and the efficiency of capital. It also affects the accumulation of capital through its impact on the saving rate or by altering the proportion of saving.

Benchivenga et al (1996) emphasized that there is positive role of liquidity provided by stock exchanges on the size of new real asset investments through common stock financing. Investors are more easily persuaded to invest in common stocks, when there is little doubt on their marketability in stock exchanges. Some contrary opinions do exist regarding the impact of liquidity on the volume of savings, arguing that the desire for a higher level of liquidity works against propensity to save (Benchivenga and Smith, 1991), (Japelli and Pagano 1994). Such arguments were not well

supported by empirical evidence. The second important contribution of stock exchanges to economic growth is through global risk diversification opportunities. Saint-Paul (1992), Deveraux and Smith (1994) and Obstfeld (1994) argue quite reasonably that opportunities for risk reduction through global diversification make high-risk high-return domestic and international projects viable. Whether global diversification might reduce the rate of domestic savings (Deveraux & Smith 1994) seemed to be a weak argument, as it is not convincingly evidenced.

Levine and Zervos (1998) analyzed by using stock market liquidity (turnover of shares and value), size (market capitalization), volatility (twelve month rolling standard deviation), integration with world markets (CAPM and APT intercept terms), and bank credit for the private (bank credit to the private sector to GDP) as predictors of economic growth, capital accumulation, improvement in productivity, and savings growth rates for forty-seven countries from 1976-93. The study reveals a positive relationship between stock market and bank development and economic growth, capital accumulation, and productivity growth. The authors conclude that stock markets provide an easy means to trade the ownership of productive assets, which facilitates resource allocation, which, in turn, facilitates capital formation, which leads to faster economic growth.

In the framework of the new growth theory, surprisingly few empirical studies of the relation between stock market and economic growth are available. The one important study mentioned earlier is one by Levine and Zervos (1998) who are among the first to ask whether stock markets are merely burgeoning casinos or a key to economic growth and to examine this issue empirically, finding a positive and significant correlation between stock market development and long run growth. The work of Luintel and Khan (1999), among others, is supportive of this view.

2.2.3 Review of Literature during 2000

Empirical work done in the past two decades mostly focused on the role of financial development in stimulating economic growth, without taking into account the stock

market development. Evolution of stock market has impact on the operation of banking institutions and hence, on economic promotion. This means that stock market is becoming more crucial, especially in a number of emerging markets and their role should not be ignored (Khan and Senhadji, 2000). The description of studies during 2000 are presented in table 2.8 and 2.9.

Beck et al (2000) analyzed the relationship between financial development and economic growth, total factor productivity growth, physical capital accumulation rates
and private savings rates. The study reported that there is a large positive effect of financial intermediaries and total factor productivity growth and economic growth but a lesser effect for long-term economic growth and total factor productivity growth.

Wurgler (2000) analyzed the relationship between financial markets and capital allocation in sixty-five countries from 1963-95. The study revealed that countries with more developed financial markets shift capital to growing industries and away from declining industries. The efficiency of the financial system is inversely related to government ownership in the economy and directly related to information availability for firms and legal protections for minority stockholders.

Tuncer and Alovsat (2001) examined stock market-growth nexus and exhibited positive casual correlation between stock market development and economic activities. Chen et al (2004) elaborated that the nexus between stock returns and output growth and the rate of stock returns is a leading indicator of output growth. The study of Phylaktis and Ravazzolo (2001) measured financial linkages by analyzing the covariance of excess returns on national stock markets of emerging economies.

Table: 2.8
Description of Empirical Studies from 2000 to 2004 AD

Study	Area	Major Findings
Beck, Levene and Loayza (2000)	Finance and sources of growth.	There is a large positive effect of financial intermediaries and total factor productivity growth.
Wurgler (2000)	Financial market and allocation of capital.	The efficiency of financial system is inversely related to information availability for firms and legal protections for minority stockholder.
Arestis et al. (2001)	Financial development and economic growth.	Both stock market and bank may be able to help in economic development.
Bell and Rausseau (2001)	A case of finance lend industrialization	Financial development in India has instrumental role for promoting economic performance.
Mishkin (2001) and Caporale et al (2004)	Financing, savings, capital and risk.	Financing productive projects mobilize domestic savings, allocate capital and diversify the risk, facilitate exchange of goods and services.

The study of Arestis, Demetriades and Luintel, 2001 found that in countries like Germany, stock market volatility has a significant and negative impact on growth. Another point worthy of note is that studies based on a cross-country framework in general have omitted China due to lack of data. Needless to say that given the increasing role of China in the world economy, understanding China is important in its own right. The study used a vector autoregressive model to study the relationship between stock market development measures and economic growth for developed economies, controlling for the banking sector development. The study finds that the stock market and economic growth both may be able to promote growth, with the impact of the banking system being stronger. With well-functional financial sector or banking sector, stock markets can give a big boost to economic development (Rousseau and Wachtel, 2000; Beck and Levine, 2003).

Mishkin (2001) and Caporale et al (2004) provided the evidence that an organized and managed stock market stimulate investment opportunities by recognizing and financing productive projects that lead to economic activity, mobilize domestic savings, allocate capital proficiency, diversify risks and facilitate exchange of goods and services. Undoubtedly, stock markets are expected to increase economic growth by increasing the liquidity of financial assets, make global and domestic risk diversification possible, promote wiser investment decisions, and influence corporate governance (Vector, 2005).

Bell and Rousseau (2001) evaluated the relationship between individual macroeconomic indicators and measures of financial development in India and revealed that the financial sector has been instrumental in promoting economic performance. Nourzad (2002) analyzed the effect of financial development on productive efficiency using eight measures of financial development for countries at different stages of economic development. The study analyzed three sets of panels of data: annual data for twenty-nine countries from 1966-90, annual data for eighteen countries from 1970-90, and five year average data for twenty-eight countries from 1970-90. The study found that productive efficiency is greater in countries where financial sectors are more developed.

Table: 2.9
Description of Empirical Studies from 2005 to 2007 AD

Study	Area	Major Findings
Shrestha (2005)	Stock Market and Economic Development.	Gross Domestic Product influence stock market.
Vinhas de Souza (2005)	Financial liberalization and business cycles: The experience of the new EU member states.	Capital market reform programs, government approved new laws are regulatory framework for capital market flourish.
Siliver and Duong (2006)	Role of stock market for real economic activity: evidence for Europe.	Stock market has certain predictive content for real economic growth.
Yartey and Adjasi (2007)	Stock market development in Sub-Saharan Africa: Critical issues and challenges	African stock market facing challenge of integration and need better technical and institutional development to address the problem of low liquidity.

Efficient stock markets provided guidelines to keep appropriate monetary policy through the issuance and repurchase of government securities in the liquid market, which is an important step towards financial liberalization. Similarly, well-organized and active stock markets could modify the pattern of demand for money, and would help create liquidity that eventually enhances economic growth (Caporale et al, 2004). Similarly, Siliverstovs and Duong (2006) revealed that the accounting for expectations has represented by the economic sentiment indicator in which stock market has certain predictive content for the real economic activity.

Paudel (2005) acknowledged that stock market, due to their liquidity, enables firms to attain much needed capital quickly, hence facilitating capital allocation, investment and growth. Adjasi and Biekpe (2005) found a significant positive impact of stock market development on economic growth in countries classified as upper middle-income economies. Chettri and Neupane (2006) concluded that stock market fluctuations help in the prediction of the future growth of an economy.

2.3 Review of Nepalese Thesis

The empirical studies of Nepalese thesis have been shown in the table 2.10. A study on saving mobilization for economic development of Nepal, Shakya (1976) analyzed the impact of saving mobilization on economic growth. The study revealed that saving is the only dependable and basic source of mobilizing internal resources. The study further concluded that without the proper saving mobilization in the productive and fruitful sectors, the attainment of economic goals could be hardly imagined. Foreign economic aid might help for economic development.

A study on banking development and its impact on economic development of Nepal Pant (1980), analyzed the importance of banking sector in Nepal. The study concluded that the establishment of Nepal Bank Limited in 1938 is considered as the emergence of the stock market in Nepal. The study covered the economic development of country before and after the establishment of banks in Nepal. It stated that the establishment of Agriculture Development Bank and Rastriya Banijya Bank has the milestone in the banking history of Nepal. The establishment of these banks has increased the economic development of Nepal. In this way, the study revealed the

importance of the stock market in the economic development of the country by relating the banking development with the emergence of the market.

Table 2.10

Description of Nepalese Thesis from 1976 to 2007

Study	Area	Findings
Shakya (1976)	Saving Mobilization for economic growth.	Significant role of financial institutions in collecting savings for investment in productive sectors.
Pant (1980)	Banking development and its impact on economic growth.	Establishment of Nepal Bank Limited is considered as the emergence of the stock market in Nepal.
Sharma (1992)	Priority sector investment of commercial banks in Nepal.	Stock market works as a source of fund, which are collected from savers and invest in priority sector.
Khatiwoda (2001)	Impact of dividend and earning announcement on shareholders' return.	Announcement of dividend depends on economic growth of the country and economic growth depends upon stock market.
Bastola (2003)	Impact of stock market in Nepal.	Financial and money markets were realized conceptuality a causative elements for the economic prosperity of nation, society and individual.
Karki (2007)	Determinants of share price in Nepalese capital market.	The security market and financial institutions supply the requirement of capital. So without the help of security markets economic growth is not possible.

The study of Khatiwada (2001) analyzed on impact of dividend and earning announcement on shareholders' return and stock prices. The study concluded that the announcement of dividend depends on the economic growth of the country and economic growth depends on the stock market.

A study on stock price in Nepal, Bastola (2003) analyzed the impact of the stock market in Nepal. The study concluded that the stock market is necessary for economic activity. Stock market will give a big boost to economic development for developing country like Nepal.

A study on determinants of share price in Nepalese capital market (Karki, 2007) analyzes the impact of share price in economic development. The study concluded that without the help of security markets economic growth is not possible.

The development of capital market appears to make greater contribution to world economy. The current thesis and articles in Nepalese context are not enough to prove the relationship between the stock market development and economic growth. In order to fill the gap, the present study has been conducted focusing on importance of stock market development in the developing nation.

2.4 Concluding Remarks

From the above, it may be seen that the effect of capital markets on economic growth has been a controversial subject. Some studies indicated the statistically significant effect of stock market development on economic growth while others did not. Similarly, some reported positive impact of stock liquidity on economic growth while some did not. In order to validate one view or the other in Nepalese context, no study has been so far conducted by using the recent data and considering Deminigue-Kunt and Levene's stock market development index. This study therefore tests the above hypothesis concerning stock market development and economic growth in developing country, like Nepal.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Design

For the analysis of relationship between the stock market development and economic growth descriptive, co-relational and time series research design has been employed. For the purpose of conceptualization and description, the descriptive research design is used. For the analysis purpose the study covers the time period between the fiscal year 2049/50 to 2062/63. This study is made on a macro level so it consists of all the sectors including commercial banks, manufacturing and processing organization, hotel sectors, trading, insurance, finance companies and, development banks and so on.

3.2 Nature and Sources of Data

This study is based on both primary and secondary data. Most of the data related to economic growth and stock market development were collected from annual report and official reports of concerned organization. The required information has been supplemented by Ministry of Finance, Department of Industries, Commerce and Supplies, economic survey published by Nepal Government, quarterly economic bulletin published by Nepal Rastra Bank (NRB), National Planning Commission, Security Board of Nepal (SEBON) and World Bank Report obtained from Tribhuvan University Library.

A field survey based on questionnaire and interview was conducted to collect opinions of different respondents in three groups. The respondents selected for the survey are stock investors, general student and public who have not invested in shares to obtain the information in respect of economic performance and stock market development.

3.3 Selection of Enterprises

The study is related to aggregate values so aggregate values of economy that is determinants of macroeconomic indicators and aggregate value of market activities that is determinants of stock market developments are selected.

3.4 Methods of Analysis

Analysis is the systematic and careful examination of available facts so that certain conclusions can be drawn from it. The major part of the study is based on the testing of association of stock market and economic growth.

3.4.1 Econometric Model

This study is heavily based on Levine and Zervos's study on stock market development and long run growth. However, their study is based on cross-country regression, but this study considers time series analysis and regression model.

The Study has determined the casual relation between stock market development and economic growth then determine how they evolve over time and finally seek the relationship between the stock market development and its economic performance. Levine and Zervos (1996) suggested the following equation to evaluate whether there is any relationship between the stock market development and long run economic growth.

$$GDP_t = \alpha Xt + \beta STOCKt + \mu_t \qquad (1)$$

Where GDP is the Gross Domestic Product and Xt is a set of control variables that is associated with GDP. These variables include government expenditure (EXPN), Public Investment (INV), public development aid (AID), foreign direct investment (FDI). In the same way STOCKt represents stock market development index. It includes market capitalization ratio (MCAP), liquidity ratio (LIQDT) and

concentration ratio (CONC). α and β are the unknown parameters to be estimated and μ_t is an error term. We can consider the following equations in details.

$$GDPt = \alpha_1 X_t + \beta_1 Mcap_t + \beta_2 Liquid_t + \beta_3 Conc_t + \mu_t \quad (2)$$

Government expenditure is selected as control variables because in underdeveloped country, government plays key role in economic growth for driving the different productive activities. Thus it can impact positively as well as negatively on economic growth. Public investment is selected as a control variable because if the public investment policy is directed correctly (for instance towards infrastructures development), it can impact significantly on economic growth, since public investment can target health, education, etc., which all contribute to increase total factor productivity. Public development aid is selected because in developing countries savings is inadequate so development aid is an 'oxygen pipe' for nation's development. Foreign direct investment is taken because it measures the private investment as domestic investment is very low as compared to it so it is ignored here.

The Liquidity ratio variable represents the turnover ratio measured as the value of total shares traded divided by market capitalization (high turnover then high liquidity). Liquidity allows investors to easily buy and sell securities. As Levine and Zervos (1996) put it, stock markets may affect economic activity through their liquidity since investors are reluctant to relinquish control of their saving for long periods. Market capitalization ratio, which equals the value of listed shares divided by GDP, is taken as the indicator for stock market development. This ratio measures the stock market size, ability to mobilize the capital and helps to diversity the risk. Concentration ratio is the four firm concentration ratios, which is measured by dividing market capitalization of four largest stocks by total market capitalization. If few companies dominate the market, they can manipulate the price formation process. Thus a high concentration ratio is not desirable. Countries with highly concentrated markets have markets that are underdeveloped. So market concentration is hypothesized to be negatively correlated with market size and market liquidity.

The above equation shows the contribution of each market stock development to economic performance.

3.4.2 Correlation Analysis

Correlation analysis is necessary in order to find out whether the selected variables in time series have any relation or not. If there is no correlation there would be no causality so this test is necessary.

Correlation is a measure of the relation between two or more variables. The measurement scales range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation, while a value of +1.00 represents a perfect positive correlation. A value of 0.00 or close to zero represents a lack of correlation.

3.4.3 Time Series Analysis of the Data

For the data analysis purpose the following time series analysis is made. They are as follows.

3.4.3.1 Unit Root Tests:

According to Nelson and Plosser (1982), Chowdhury (1994) there exists unit roots in most macroeconomic time series. While dealings with time series, it is necessary to analyze whether the series are stationary or not. Since regression of non-stationary series on other non-stationary series leads to what is known is spurious regression causing inconsistency of parameter estimate (Engle and Yoo, 1987). The hypothesis behind it is that random shocks in economy have long lasting effects (Engle & Granger, 1987). The most popular of these tests are the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) tests. ADF test has been considered for this study because ADF tests use a parametric autoregressive structure to capture serial correlation. To conduct the ADF test, it is necessary to estimate the following regression.

$$\Delta y_t = \sim + \quad {}_1 y_{t-1} + \quad {}_2 t + \sum_{j=1}^{T} \text{¥}_j \Delta y_{t-j} + £_t \qquad (4)$$

Here yt is the relevant time series and et is a white noise residual, t is a linear deterministic trend (Mehra, 1994). The ADF test consists of testing the null hypothesis that β1 = 0 (hypothesis that the series has unit root). According to Engle & Yoo (1987) the null hypothesis is rejected if pseudo t-static on βi is below the critical value.

3.4.3.2 Co-integration Test

The finding that many macro time series may contain a unit root has spurred the development of the theory of non-stationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are said to be co-integrated. The stationary linear combination is called the co-integrating equation and may be interpreted as a long-run equilibrium relationship among the variables. The purpose of the co-integration test is to determine whether a group of non-stationary series is co-integrated or not.

There are two different methods for testing of co-integration, as developed by Engle and Granger (1987) and Johansen (1988). Jung and Seldon (1995) state that the Johansen co-integration test is more valid as there is no need of prior knowledge of the co-integration vectors, in cases when they are unknown. As this study does not have the co-integration vectors it is better to use the Johansen (1988) test. The Johansen methodology utilizes Vector Auto Regression (VAR) to test the co-integration. The Johansen (1988) method of testing for the existence of co-integrating relationships has become standard in the econometrics literature because of its superiority over other alternatives. The approach is based on the estimation of a pth order VAR in K variables. The VAR in k-vector y is:

$$y_t \quad A_1 y_{t\ 1} - \cdots - A_p y_{t\ p} - B x_t + \epsilon_t \qquad (5)$$

Where yt is a k-vector of non-stationary variables, xt is a d-vector of deterministic variables, and $£_t$ is a vector of innovations. We may rewrite this VAR as

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + Bx_t + \varepsilon_t \quad (6)$$

Where

$$\Pi = \sum_{i=1}^{p} A_i - I, \qquad \Gamma_i = -\sum_{j=i+1}^{p} A_j$$

Granger's representation theorem asserts that if the coefficient matrix ∏ has reduced rank $r < k$, then there exist $k \times r$ matrices α and β each with rank r such that ∏= αβ' and β'y_t is I(0). r is the number of co-integrating relations (the co-integrating rank) and each column of β is the co-integrating vector. As explained below, the elements of α are known as the adjustment parameters in the VEC model. Johansen's method is to estimate the matrix from an unrestricted VAR and to test whether we can reject the restrictions implied by the reduced rank of ∏ (Quantitative Micro Software, 2005).

3.4.3.3 Granger Causality between Economic Growth and Stock Market Development

Measuring the correlation (similarities in strength and direction between two graphs) between variables such as GDP and STOCK would according to Granger (1969) not be enough to construct a complete understanding about the relationship between two time series. The reason is that some correlations may be spurious and not useful, as there might be a third variable that cannot be accounted for. For example there is a correlation between teacher's salaries in the UK and the consumption of alcohol in the UK. Another example is that ice cream sales are correlated to shark attacks on swimmers (Lethen, 1996). In both examples it would be highly unlikely that one causes the other but that there exists other hidden variables affecting both. There is a correlation but no causal connection.

By using the Granger causality approach with the question if variable **X** (in a time series) causes variable **Y** (in another time series), a researcher wants to see how the value of the existing **Y** can be explained by past values of **Y**.

This does in practice imply that if a variable that is Granger causing another variable in a certain direction or both, manipulation of one would affect the other. To reduce

spurious results, the process of finding Granger causality also involves finding out other relations between the time series and such relations include looking at correlation and co-integration (Sahlin and Sjogren, 2008). Hence this study is not only looking at the correlation, co-integration and causality but also looking at a further developed relationship between the time series. This is combined to produce an answer to if there is a relationship between the variables. Hence, in this study the word relationship stated by statistical software is used as a generic term for the combined correlation, co-integration and causality time series. For the calculation purpose the following equations have to be estimated.

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \ldots + \alpha_l y_{t-l} + \beta_1 x_{t-1} + \ldots + \beta_l x_{-l} + \epsilon_t$$
$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \ldots + \alpha_l x_{t-l} + \beta_1 y_{t-1} + \ldots + \beta_l y_{-l} + u_t$$

Where x and y are the two series representing GDP and STOCK respectively.

The equation coefficient implies that past equilibrium errors plays a role in determining the current outcomes. The null hypothesis is that x does not Granger cause y in the first regression and that y does not granger cause x in second equation. These hypotheses are tested using the standard F statistics (Mehara, 1994).

3.4.4 Other Statistical Tools Considered

For our data presentation and analysis we have considered the other different test also. They are mean, median, standard deviation, maximum and minimum, T-test, F-test and Standard Error of Estimate (SEE).

3.5 Limitations of Study

Using the different econometric models for the analysis of the stock market development and economic growth is not likely to produce the reliable results due to wide range of data deficiencies. Data for aggregate variables are only available on annual basis with wide variation between the sources. The empirical analysis is based on the period of fifteen years only. This much time period is not enough to make

different tests and analysis however attempt has been made to find the relationship. The following are the main limitations of this study.

- The study covers only the period of 15 or less years because of time and resource constants.
- This study has not attempted to examine the effect of stock market development on other macro economic indicators such as money supply, price level, employment, poverty alleviation, consumption and investments. The parameters chosen for the study are not enough.
- The study is based on annual data only. If monthly or quarterly data is available then the result might have been far better and reliable than what is expected from this analysis.
- The empirical analysis is based on both primary secondary sources of data, authenticity of which may be questioned, as there are variations in same data at different sources.
- Data on some variables are not available so adjustments have to be made for analysis.
- The assumptions that strong and efficient stock market enhance productivity and efficient allocate of resources may not be true in Nepal the Nepalese stock market is not strongly efficient.

CHAPTER 4
PRESENTATION AND ANALYSIS OF DATA

There are many studies that have examined the relationship between growth and stock markets using either cross country or panel methods. However their empirical approach typically suffers from serious econometric weakness. Traditional growth theorists believed that there is no correlation between stock market development and economic growth. Singh (1997) argues that stock markets are not necessary institutions for achieving high levels of economic development. Some recent studies have stated that stock markets play an important role in allocation of capital to corporate sector that in turn stimulate real economic activity. Studies of Caporale (2004), Vector (2005), Mishkin (2001) and few other studies too state that an organized and managed stock market stimulates economic activities. Most of these studies have reported positive effects of stock on economic growth. One group of study argues that stock markets do not help in economic development of a nation while the other group argues that it help in economic development.

With this contrast view, this study attempts to find possible connection between stock market development and economic growth with reference to Nepal. The variables selected for the study are Gross Domestic Product (GDP), Government Investment (INV), Government Expenditure (EXPN), Foreign Aid (AID), Foreign Direct Investment (FDI), Market Capitalization Ratio (MCAP), Concentration Ratio (CONC) and Liquidity (LIQDT).

4.1 Economic Growth and Stock Market Performance in Nepal

One of the ways to indicate the macroeconomic performance is to analyze the Gross Domestic Product (GDP). The gross domestic product (GDP) in Nepal has increased from 1992/93 to 2006/07. It increased from Rs.165350 millions in 1992/03 to Rs.670589 millions in 2006/07. The increase is being 3.65 times over the period of time. The table 4.1 highlights the annual GDP with its growth index by considering 1992/03 as a base year and annual percentage change over the period of time. The

highest growth index is noticed during 2005/06 with 365.088 percent and the lowest is noticed in year 1993/94 with index of 115.873 percent.

Table: 4.1
GDP, percent change and growth index from year 1992/93 to 2005/06

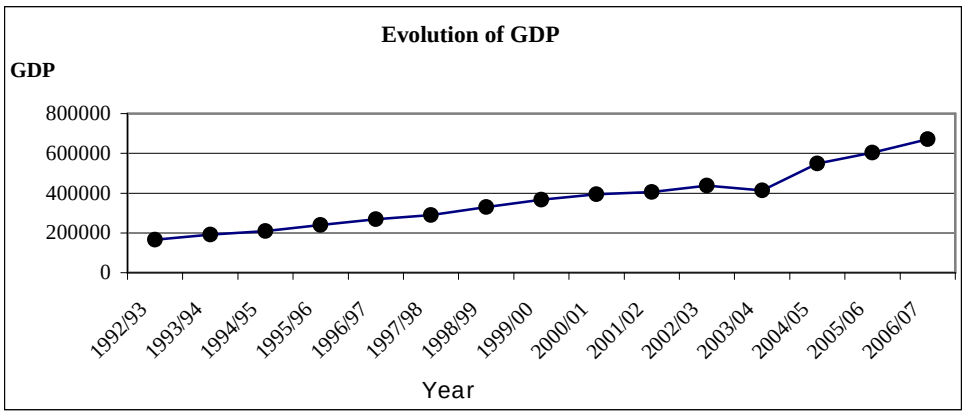
Year	GDP *	Percent change	Growth Index**
1992/93	165350	-	-
1993/94	191596	15.87	115.873
1994/95	209976	9.59	126.988
1995/06	239388	14.01	144.776
1996/07	269570	12.61	163.029
1997/08	289798	7.50	175.263
1998/09	330018	13.88	199.587
1999/00	366251	10.98	221.500
2000/01	394052	7.59	238.313
2001/02	406138	3.07	245.623
2002/03	437546	7.73	264.618
2003/04	414129	-5.35	250.456
2004/05	548485	32.44	331.711
2005/06	603673	10.06	365.088

The sign * denotes GDP in millions.
The sign ** denotes growth index in percentage.

The annual percent change varies from –5.35 percent in year 2003/04 to the highest of 32 percent in 2004/05. The figure 4.1 highlights the trend in GDP over the period of time.

Figure: 4.1

Evolution of GDP from 1992/93 to 2006/07



The figure indicates the increasing trend in GDP over the study period of time.

The Stock Market Development

Nepalese capital market had its beginnings with the establishment of the Securities Marketing Center in 1976. In 1984, the Securities Exchange Act was promulgated and

this institution was converted into the Securities Exchange Center (SEC) under the ownership of the Nepal Government, Nepal Rastra Bank and Nepal Industrial Development Corporation.

The real boost into the capital market in the form of a private sector led growth began with the financial sector liberalization. In the mid-eighties, Nepal opened its doors to foreign investors as joint venture partners in the banking sector, which revolutionized commercial banking services in Nepal. Since then, a variety of private sector based financial institutions have evolved. In 1992, the Finance Companies Act was amended. This enabled finance companies to be established to function in various areas such as leasing, housing finance, and hire purchase. These institutions were also allowed to perform capital market functions such as share issue, portfolio management, market making and custodial services. In this way capital market was developed in Nepal. Evolution of capital market with the help of market capitalization is shown in the table 4.2

Market capitalization is the total market value of all the company's outstanding shares. It is calculated by multiplying total companies outstanding shares by current market price. Market capitalization helps to analyze the size of market. Larger the market size, higher the ability to mobilize the capital and to diversify the risk (Fofana, 2006)

Table: 4.2
Market Capitalization, Percent Change and Growth Index for Year 1992/93 to 2005/06

Year	Market capitalization*	Percent change	Growth index**
1992/93	4000	-	
1993/94	13872	246.80	346.8
1994/95	12963	-6.55	324.07
1995/06	12295	-5.15	307.37
1996/07	12698	3.28	317.45
1997/08	14289	12.53	357.22
1998/09	23508	64.52	587.70
1999/00	43123	83.44	1078.07
2000/01	46349	7.48	1158.72
2001/02	34704	-25.13	867.60
2002/03	35240	1.54	881.00
2003/04	41425	17.55	1035.62
2004/05	61366	48.14	1534.15
2005/06	96763	57.68	2419.07

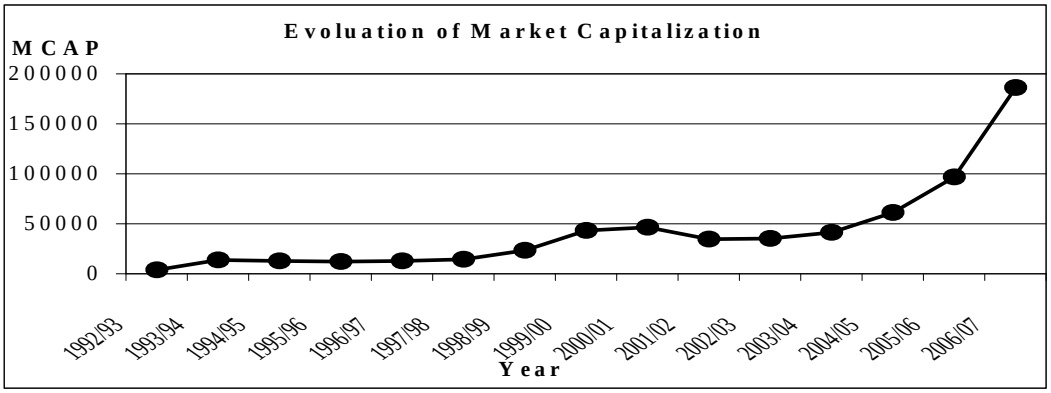
Note: 1. The sign * indicates the market capitalization in millions.
2. The sign ** indicates the growth index in percent.

Result shows that the size of market has increased from 4000 millions to the 96763 millions over the period of 13 years from 1992/03 to 2005/06. This increase is 24 times over the period. The maximum annual change is noticed in year 1993/04 and negative change is noticed in year 2001/02 with percent values of 246.80 and –25.13 respectively.

A plot of the available data on market capitalization, shows a steady and smooth (till 2000/01) upward sloping trend. From 2004/05 the market capitalization has increased sharply and continued to 2006/07. This trend can be seen in the Figure 4.2.

Figure: 4.2

Evolution of Market Capitalization from 1992/93 to 2006/07



In addition to analyze of stock market development in Nepal, trend of turnover ratio and concentration ratio have been analyzed. In table 4.3 the values of turnover and concentration ratios are reported.

Table: 4.3
Year wise Turnover (liquidity) and Concentration ratios on Market Capitalization from Year 1995/96 to 2005/06

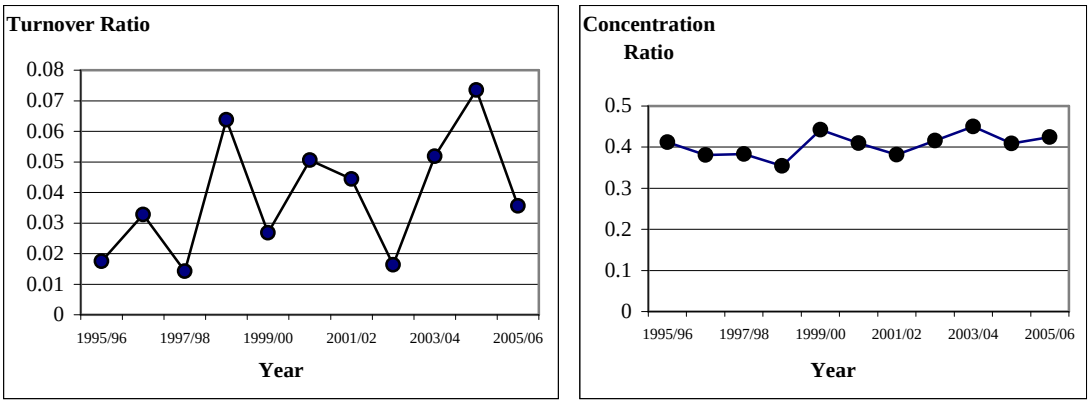
Year	Turnover	Turnover Ratio	Concentration	Concentration Ratio
1995/96	215.60	0.0175	5064.18	0.4118
1996/97	416.20	0.0328	4840.00	0.3811
1997/98	202.60	0.0142	5478.12	0.3833
1998/99	1500.00	0.0638	8324.10	0.3540
1999/00	1157.0	0.0268	19069.18	0.4422
2000/01	2344.20	0.0506	18975.27	0.4093
2001/02	1540.60	0.0444	13236.04	0.3814
2002/03	575.80	0.0163	14645.38	0.4155
2003/04	2144.30	0.0518	18633.17	0.4498
2004/05	4507.70	0.0735	25116.17	0.4092
2005/06	3451.40	0.0356	41076.55	0.4245

Turnover (liquidity) ratio is measured as the value of total shares traded divided by market capitalization. Active markets will have high liquidity ratio as liquidity allows the investors to easily buy or sell the shares (Forana, 2006). Concentration ratio is the ratio of market capitalization of four largest firms and total market capitalization. If few firms dominate the market then they can manipulate the price formation process.

The figure: 4.3 display the trend of turnover ratio and concentration ratio of share market. The figure shows that the liquidity of stock market has fluctuated largely over the past 10 years. This indicates that share price were highly volatile during the study period. The highest liquidity ratio is reported in the year 2004/05 with the ratio of 0.075 and lowest of 0.0175 in year 1995/06. Japan and the United States had liquidity ratios of almost 0.5 during the period 1976-93. Markets that are less liquid, such as Bangladesh, Chile, and Egypt, had turnover ratios of 0.06 (Levene, 2003). High liquidity ratios are expected as the sign of perfect competition (Fofana, 2006).

Figure: 4.3

Turnover ratio and concentration ratio from 1995/96 to 2005/06



Source: SEBON journal Vol. III, July 2007

A high concentration ratio is noticed over the period of 10 years. All the ratios are between 0.3 and 0.5. Such high concentration ratios are not desirable. Countries with highly concentrated market will have underdeveloped capital markets and it has negative impact on economic growth (Fofana, 2006).

4.2 Descriptive Statistics Analysis

The table 4.4 summarizes the results of descriptive statistics of the selected variables from the year 1992/03 to 2006/07.

Table 4.4

Descriptive statistics of selected variables from 1992/93 to 2006/07

Variables	Number of observations	Mean	Standard Deviation
GDP (In million)	15	369103.9	151115.8
INV (In million)	14	27054.87	4991.287
EXPN (In million)	14	66399.76	25376.33
AID (In million)	14	16086.58	4004.39
FDI (In million)	15	5746.00	3173.22
LIQDT	13	0.0415	0.021
CONC	12	0.4063	0.273
MCAP	15	9.602	6.270
STOCK	11	-0.038	0.244

It is observed that the indicators of stock market development, including stock market liquidity, four firm concentration ratio and stock market capitalization ratio have relatively low variability. Indeed, the standard deviations are 0.021, 0.273 and 6.27 respectively. The economic indicator, GDP has the highest level of variability with the mean value of Rs.369103.9 millions and FDI has lowest level of variability with the mean value of Rs.5746 millions.

4.3 Simple Correlation Analysis

First of all, an attempt is made to determine relationship that exists among those selected variables. For this purpose simple correlation has been computed and presented in Table 4.5 in the form of correlation matrix.

This correlation table gives a preliminary idea of the direction of the relationship between the selected variable. That is, the higher correlation has been observed between EXPN and AID, EXPN and MCAP, EXPN and STOCK and EXPN and GDP. Except for these a lower correlation has been observed for all other variables. As regards INV a positive relation has been obtained with all the selected variables

except for CONC. The positive relationship is noticed between AID with all other selected variables and MCAP with all those selected variables.

Table 4.5
Simple Correlation matrix of economic growth and stock market index with their selected controlled variables

	INV	EXPN	AID	FDI	MCAP	CONC	LIQDT	STOCK	GDP
INV	1.000								
EXPN	0.128	1.000							
AID	0.058	0.804	1.000						
FDI	0.080	-0.167	0.035	1.000					
MCAP	0.400	0.836	0.782	0.059	1.000				
CONC	-0.116	0.450	0.419	0.010	0.491	1.000			
LIQDT	0.039	0.441	0.540	-0.253	0.330	-0.148	1.000		
STOCK	0.233	0.788	0.819	-0.131	0.809	0.268	0.816	1.000	
GDP	0.160	0.979	0.823	-0.110	0.876	0.382	0.422	0.791	1.000

As regards FDI low relationship exists among the selected variables. The lower negative relationship is observed between STOCK and FDI and GDP and FDI. Except for this other variables have positive relationship with STOCK and GDP. There is a negative relationship observed between LIQDT and FDI and LIQDT and CONC however other variables have positive relationship with it. As regards CONC, it has low degree of correlation with the selected variables.

4.4 Regression Analysis

After examining the correlation among the selected variables the bivariate and multiple regression analysis has been undertaken for the purpose of investigating the causality between the stock market indicators and economic growth indicators. The bivariate and multiple regressions open up several additional options to enrich analysis and make modeling more realistic.

The relationship of GDP with each stock market indicators is presented in table 4.6 by using the regression equations (i), (ii) and (iii). The independent variables considered are MCAP, CONC and LIQDT. The GDP is taken as a dependent variable.

The results indicate that the MCAP, CONC and LIQDT are positively related with GDP. These estimated coefficients of MCAP, CONC and LIQDT are also consistent with the correlation analysis.

Table: 4.6
Regression analysis of Gross Domestic Product (GDP) on Market Capitalization (MCAP), Concentration (CONC) and Liquidity (LIQDT)

Regressions Equations:

$GDPt$ = Constant + β_1 MCAP + μ_t…(i); $GDPt$ = Constant +β_2 CONC + μ_t…(ii); $GDPt$ = Constant +β_3 LIQDT + μ_t…(iii)

Eqn	Coefficients	Results obtained				
		Estimated Coefficient	Standard Errors	Prob.	F-test	Adjusted R^2
i	Constant	158327.592*	45799.649	.007	29.944	0.743
	MCAP	25464.946*	4653.592	.000		
ii	Constant	-218192.88	490977.322	.667	1.546	0.052
	CONC	15011.433	12074.809	.245		
iii	Constant	297982.023*	73715.767	.003	1.961	0.088
	LIQDT	23899.971	17066.317	.195		

Notes: The sign * denotes that the results are significant at 5% level of significance.

The results reveal that coefficient for MCAP is significant at 5 percent level of significance, where as the other independent variables CONC and LIQDT are not significant although they have positive signs. The value of adjusted R-square for MCAP is 0.743, which means that 74.3 percent variability in dependent variable has been explained by the MCAP variable. For CONC and LIQDT adjusted R-square is quite low indicating 5.2 and 8.88 percent respectively signifying low variability in predicting the dependent variable within the model.

It is found that goodness of fit for the model is satisfactory, and that the sufficient variability is explained by independent variables used in the model.

The relationship between the stock market development and economic growth has been analyzed in the table 4.7 by adding two more independent variables government investment (INV) and government expenditure (EXPN).

Table: 4.7

Multiple regression analysis of Gross Domestic Product (GDP) on Government Investment (INV), Government Expenses (EXPN) and Market Capitalization (MCAP)

Regressions Equations are:

GDPt = Constant + α_1 INV+ α_2 EXPN + β_1 MCAP + μ_t … (iv); *GDPt* = Constant + α_1 INV+ α_2 EXPN + β_2 CONC + μ_t… (v); *GDPt* = Constant + α_1 INV+ α_2 EXPN + β_3 LIQDT + μ_t… (vi)

Eqn	Coefficients	Results obtained					
		Estimated Coefficient	Standard Errors	Prob.	F-test	Adjusted R^2	Partial Correlation
iv	Constant	409934 (0.562)	72895	0.591			
	INV	-0.927 (-0.404)	2.3	0.698			-0.151
	EXPN	4.20 (6.251)*	0.7	0.000	79.495	0.959	0.921
	MCAP	6425 (1.60)	4016	0.154			0.517
V	Constant	77891 (0.547)	142390	0.601			
	INV	0.70 (0.314)	9	0.762			0.118
	EXPN	5.00 (12.384)*	2	0.00	64	0.949	0.97
	CONC	-2666 (-0.837)	3185	0.43			-0.30
vi	Constant	-27242 (-0.396)	68807	0.70			
	INV	1.05 (0.464)	2.25	0.66			0.17
	EXPN	5.20 (11.716)*	0.44	0.00	58	0.945	0.975
	LIQDT	-651 (0.139)	4692	0.89			-0.05

Notes: The sign * denotes that the results are significant at 5% level of significance.

Source: Appendix

As regards to equation (iv), EXPN and MCAP have positive association while negative association exists between GDP and INV. The t-statistic suggests that the variable EXPN is significant and therefore has higher predictive power than other variables. The relationship has been further analyzed by considering the coefficient of determination. The adjusted R-square for the model states the variability in GDP by the MCAP, INV and EXPN is 96 percent.

As regards to equation (v), positive relationship is observed between EXPN and INV while negative impact is seen on CONC and LIQDT. The t-statistic shows that the variable EXPN is highly significant with dependent variable. The adjusted R-square shows that the 95 percent of variability has been covered by independent variable INV, EXPN and CONC.

In the equation (vi), there exists positive association between INV and EXPN while negative relation observed between LIQDT. The t-statistic suggests that LIQDT has higher predictive power than INV and EXPN. The coefficient of determination is 0.945 which indicates about 94.5 percent variation in dependent variable has been explained by independent variables INV, EXPN and LIQDT. This finding is not consistent with the findings of Shrestha (2006).

Further analysis has been made on MCAP, CONC and LIQDT by adding one more independent variable of AID to the previously defined regressions equations. The new regression equations for analysis are presented at table 4.8.

With respect to equation vii, the computed regression shows that all the coefficients have priori expected signs. However, only a few coefficients are found to be significant. As regards equation vii, positive association is observed among GDP, EXPN, AID and MCAP and negative association is observed for INV and GDP. Only EXPN is significant at 5 percent level of significance. The result of adjusted R-square indicated that 95 percent of variability has been explained by the independent variables with dependent variables.

In equation viii, MCAP has been replaced by the CONC. There is positive association between all the selected variables except for CONC. The result of t-statistic suggests that out of four variables, only EXPN is significant determinant of GDP. Therefore EXPN has more explanatory power.

Table: 4.8

Regression of Gross Domestic Product (GDP) on Government Investment (INV), Government Expenses (EXPN) and Market Capitalization (MCAP)

Regressions Equations:

$GDPt$ = Constant + α_1 INV+ α_2 EXPN + α_3 AID + β_1 MCAP + μ_t… (vii); $GDPt$ = Constant + α_1 INV+ α_2 EXPN + α_3 AID + β_2 CONC + μ_t… (viii) $GDPt$ = Constant + α_1 INV+ α_2 EXPN + α_3 AID + β_3 LIQDT + μ_t… (ix)

Eqn	Coefficients	Results Obtained					
		Estimated Coefficient	Standard Errors	Prob.	F-test	Adjusted R^2	Partial Correlation
vii	Constant	22521 (0.215)	104874	0.84			
	INV	-0.703 (-0.270)	2.60	0.80			-0.11
	EXPN	4.17 (5.442)*	0.77	0.00	51.71	0.95	0.91
	AID	1.25 (0.265)	4.74	0.80			0.10
	MCAP	5851.5 (1.213)	4826	0.27			0.44
viii	Constant	48007 (0.327)	146794	0.755			
	INV	0.81 (0.366)	2.21	0.727			0.02
	EXPN	4.86 (7.32)*	0.66	0.00	47.3	0.95	0.52
	AID	4.22 (0.95)	4.44	0.38			0.068
	CONC	-2958 (-0.918)	3222.07	0.394			-0.66
ix	Constant	-70830 (-0.85)	83811	0.43			
	INV	1.20 (0.53)	2.282	0.62			0.21
	EXPN	4.72 (6.96)*	0.68	0.00	42.69	0.94	0.94
	AID	4.61 (0.93)	4.96	0.39			0.36
	LIQDT	-2276 (-0.45)	5050	0.67			-0.18

Note: The figure * indicates significance at 5 percent level of significance.

The adjusted R-square is 0.95, this indicates more than 90% of the variability has been explained by independent variables INV, EXPN, AID and CONC. Similarly, the results of equation ix, presents the variable EXPN has more explanatory power

compare to other variables. The computed R-Square indicates more than 90 percent variation in dependent variables has been explained by independent variables.

Table 4.9
Multiple regression analysis of economic growth and stock market index with their selected controlled variables

$GDPt$ = Constant + α_1 INV+ α_2 EXPN + α_3 AID + α_4 FDI + β_1 MCAP + β_2 CONC + β_3 LIQDT + $\mu_{t...(X)}$

Variables	Coefficient	Std. Error	Prob.	Partial Correlation
Constant	342583.8 (1.9)	182121.2	0.157	
INV	-2.672195 (-1.05)	2.538353	0.37	-0.52
EXPN	4.164426 (5.50)*	0.756209	0.01	0.95
AID	3.008017 (0.614)	4.897596	0.58	0.33
FDI	-0.817088 (-0.24)	3.360726	0.82	-0.14
MCAP	9236.144 (1.89)	4884.232	0.15	0.74
CONC	-7334.303 (-2.14)	3433.762	0.12	-0.78
LIQDT	-5778.926 (-1.14)	5068.764	0.34	-0.55
R-squared	0.988893		F-test	38.15
Adjusted R-squared	0.962975			

Note: The figure * indicates significance at 1 percent level of significance.

The result indicates that GDP is positively related with EXPN, AID, and MCAP, and negatively related with INV, CONC and LIQDT. These results are consistent with multiple correlation analysis.d

The R-squared statistic measures the success of the regression in predicting the values of the dependent variable within the sample. The R-square value is an indicator of how well the model fits the data. The Adjusted R-square is 0.96. It indicates that the result has accounted for almost 96 percent of the variability with the variables specified in the model. The value of F is 38.15, which states that the goodness of fit is satisfactory and sufficient variability is explained by independent variables for explaining the model.

4.5 Test of Stationarity

The test statistics may often show a significant relationship between the variables in the regression model even though no such relationship exists. This type of regression is known as spurious regression (Patterson 2000). While dealings with time series, it is necessary to analyze whether the series are stationary or not (Chowdhury, 1994). To solve the problem of spurious regression, the stationary of the time series is examined by conducting unit root test of Dickey-Fuller (ADF) test.

Table 4.10
Augmented Dickey-Fuller (ADF) test for Economic growth and stock market index

Time Series	ADF Test of Statistics		Null Hypothesis	Results
	Levels	1st Diff.		
GDP	1.13158**	-2.534718**	Accepted	Non-Stationary
STOCK	-1.665475**	-3.627448*	Accepted	Non-Stationary

Note: 1. The sign * and ** indicates significance at 1 percent and 5 percent level of significance respectively.
2. Value of 1% and 5% level of significance is shown at the Annex

The null hypothesis "GDP has a unit root" states that the time series is non-stationary. The ADF statistic value for GDP is 1.131582, which is greater than critical values for that reason this study does not reject the null hypothesis. This states that GDP has a unit root test. Similarly ADF test of 1st difference states that its value is greater than the critical values and the hypothesis "GDP has unit root" is also accepted. The null hypothesis "STOCK has a unit root" is also accepted at 5 percent level of significance and for the 1st difference level it is accepted at 1 percent level of significance. The table reports that the time series of the variables (GDP and STOCK) used in the study are non-stationary and integrated of order 1. This result is consistent with the result of Shrestha (2006) and Bahadur and Neupane (2006).

4.6 Test for Co-integration

After analyzing the stationary test, the co-integration analysis is used to investigate long-term relationship between the stock market development and economic growth. Two types of test are reported for co-integration test. The first part reports trace statistics and second part reports Max-Eigenvalue statistic (see Annex V). The trace statistics and Max-Eigenvalue indicate no co-integration between STOCK and GDP at the 5 percent level of critical value.

Table 4.11
Co-integration between economic growth and stock market index

Variables	Type of test	Results
STOCK and GDP	Trace test	No co-integration
	Maximum Eigenvalue test	No co-integration

Source: Appendix

No co-integration means that STOCK and GDP do not move together in long run at the same rate (Engle and Granger, 1987). This finding is also consistent with the findings of Adjasi and Biekpe (2005), Rousseau and Wachtel (2000) and Demetriades and Hussain (1996).

4.7 Test for Causality

The procedure used in the study for testing statistical causality between the stock market and economy is the "Granger causality" test developed by C.W.J. Granger in 1969.

Table 4.12
Granger causality test between economic growth and stock market index for lag length of 2 and 3 years

Hypothesis for direction of causality	**F-value**	**Causality**	**No. of Lags**
GDP does not Granger cause STOCK	1.141	No	2
STOCK does not Granger cause GDP	1.442	No	2
GDP does not Granger cause STOCK	22.840*	Yes	3
STOCK does not Granger cause GDP	2.673	No	3

The sign * indicates that null hypothesis is rejected at 5% level of significance

The results given in table 4 suggest that at 5 percent level of significant the direction of the causality is from GDP to STOCK when lag length of 3 years is taken.

However there is no any reverse relation from STOCK to GDP. This finding corroborates with existing empirical work of Adjasi and Biekpe (2005), Mauro (2000) and Chettri and Neupane (2006).

4.8 Analysis of Primary Data

This study deals with the study of opinions of respondents with respect to stock market development and economic growth in Nepal at the micro level. The study is based on interview and questionnaire survey of 52 respondents. Out of them 23 respondents were stock investors, 13 respondents were to students, and 16 respondents were normal people, who have not invested in shares. The different classifications of respondents are selected for analyzing the differences in their opinions. The proforma of structured questionnaire and responses on various aspects of stock market development analysis are all presented in Appendix.

Background Information

The respondents were asked to select the options regarding their knowledge about the capital market development in Nepal. The majority of these respondents (61% of Investors, 61% of students and 50% of general public) reports that they have the general knowledge about the capital market development in Nepal.

Table: 4.13
Level of Knowledge about the Stock Market Development in Nepal.

Category	Option A	Option B	Option C	Total Number
Investors	14	9	0	**23**
Students	8	2	3	**13**
General Public	8	5	3	**16**
Total Number	**30**	**16**	**6**	**52**

Options: A. General B. Specific C. No Idea
General Public: Those who have not invested in shares.

Similarly study reports that 31 percent of total respondents including investors, students and general public think that they have specific knowledge about the stock market development. Similarly 12 percent respondents have no idea about the capital market in Nepal. Table 4.13 shows the detail results of the respondents.

Stock Market Development and Economic Growth

The respondents were asked whether the stock market development helps in economic growth of a nation or not. The responses obtained were shown in table 4.14.

Table: 4.14
Stock Market Development and Economic Growth

Category	Option A	Option B	Option C	Total Number
Investors	12	2	8	**22**
Students	5	3	5	**13**
General Public	3	8	5	**16**
Total Number	**20**	**13**	**18**	**51**

Options: A. Yes B. No C. Some how

The results indicate that about 39 percent of total respondents are in opined stock market development helps in economic growth. Similarly 35% think that it is somehow helping the economic growth. But 26 percent of the respondents are against it. They say that stock market developments do not help in economic growth of the nation.

Capital Market and Domestic Savings

The majority of the respondents (48%) believe that stock market is helping in mobilization of domestic savings. Of them, 27 percent reported that capital market is not able to mobilize the domestic savings. Concerning the information, 25 percent do not know whether it helps or not.

Table: 4.15
Stock Market Development and Economic Growth

Category	Option A	Option B	Option C	Total Number
Investors	14	4	5	**23**
Students	5	3	5	**13**
General Public	6	7	3	**16**
Total Number	**25**	**14**	**13**	**52**

Options: A. Yes B. No C. Do not know

The table 4.15 shows the detail analysis of survey of stock market development and economic growth.

Determinants of Stock Market Development in Nepal

The majority of the respondents feel that macro economic stability determines the stock market development in Nepal. Of them 45 percent believe that if economic stability can be gained then other factors don't determine the economic growth. Similarly 35 percent respondents believe that development of banking sectors determines the stock market development. Of them, 20 percent feel that institutional development determines the stock market development.

Table: 4.16
Determines of Stock Market Developmet

Category	Option A	Option B	Option C	Total Number
Investors	9	10	4	**23**
Students	6	3	3	**12**
General Public	8	5	3	**16**
Total Number	**23**	**18**	**10**	**51**

Options: A. Macro Economic Stability B. Banking Sector Development C. Institutional Quality

Table 4.16 indicates the different determines of stock market development in Nepal.

Liquidity Position of Stock Market in Nepal

Liquidity measures the risk of capital market. High liquidity means that the investors feel low risk in stock investment. The majority of respondents (29%) do not know what the liquidity position of capital market. The 28 percent of respondents think that there is low liquidity in capital markets where as 17 percent and 26 percent of total respondents feel that there is respectively high and moderate liquidity position.

Table: 4.17
Liquidity position of Nepalese Capital Market

Category	Option A	Option B	Option C	Option D	Total Number
Investors	5	6	6	5	**22**
Students	2	4	5	2	**13**
General Public	2	3	3	8	**16**
Total Number	**9**	**13**	**14**	**15**	**51**

Options: A. High B. Moderate C. Low D. Do not know

The Table 5 shows the liquidity position of Nepalese capital market.

Current Trading Price of Share

The survey findings indicate that 33 percent of respondents have no idea about the current trading price of share. The 27 percent of the respondents believe that the share price is under priced. The 20 percent respondents believe that share price is fairly priced and again 20 percent think that share price is over priced.

Table: 4.18
Current Trading Price of share in Nepalese Capital Market

Category	Option A	Option B	Option C	Option D	Total Number
Investors	5	5	10	2	**22**
Students	2	3	1	7	**13**
General Public	3	2	3	8	**16**
Total Number	**10**	**10**	**14**	**17**	**51**

Sources: A. Fairly priced B. Over price C. Under price D. Don't know

Share Price Movement in Nepal

The share price movement in Nepal is not a random phenomenon. For finding this respondents were provided with a list of three different statements of observations on share price behavior in Nepal and they were asked to choose the options. The result of the survey is presented in the table 4.19.

Table: 4.19
Reasons for share price movement in Nepal

Category	Option A	Option B	Option C	Option D	Total Number
Lack of proper information.					
Investors	16	5	1	1	**23**
Students	5	4	1	3	**13**
General Public	4	3	6	3	**16**
Total Number	**25**	**12**	**8**	**7**	**52**
Poor performance of market intermediaries.					
Investors	13	4	0	4	**21**
Student	4	2	4	3	**13**
General Public	4	4	6	1	**15**
Total Number	**21**	**10**	**10**	**8**	**49**
Speculative behavior of the investors.					
Investors	4	2	7	10	**23**
Student	6	2	2	3	**13**
General Public	8	3	1	4	**16**
Total Number	**18**	**7**	**10**	**17**	**52**

Options: A. Strongly agree B. Agree C. Don't know D. Disagree

Regarding the reasons for price movement in Nepal, the majority of the respondents (48%) strongly agree that the lack of proper information can be the reason for price fluctuation. Similarly 43 percent of the respondents believe that poor performance of the market intermediaries can be the reason for random price movement. Of the respondents, 35 percent believe that speculative behavior of the investors can be the reason.

Barriers of Stock Market Development in Nepal

Respondents were asked to indicate the different barriers for capital market development. The most frequently repeated barriers of the stock investors are government policies, high tax on capital gain, high transaction cost, behavior of stock broker, low liquidity, high interest rate for loan, low valuation of stock while taking loan and high price fluctuation.

Promotion of Stock Market Development in Nepal

Respondents were asked to list out all the suggestions that can help to promote the capital market of Nepal. The suggestions are promotion of institutional investors, regulation and supervision, attract capital flow, encourage foreign participations, education, regional development of stock exchange, non-mutual trading, automation, shareholders protection act etc.

4.9 Concluding Remarks

From the survey, it can be concluded that capital market, in Nepal is facing a number of challenges before they could enter a new phase of rapid growth. Stock market can be developed by solving the challenges and issues concerning regional development of stock market, harmonization of legislations such as bankruptcy, accounting laws, liberalized trade, demutualization of transaction, technological and regulatory reforms, elimination of existing impediments to institutional development like tax and commission, wider dissemination of information to investors, technological and regulatory reforms and implementation of internet based electronic trading system.

CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This study mainly aims at examining the relationship between the stock market and economic growth with the help of its indicators with context to Nepal. Its specific objectives are: (1) to conduct the relationship between the market capitalization and gross domestic product (2) to analyze the impact of firm concentration ratio on economic growth of a nation, (3) to analyze the significance of liquidity on economic growth (4) to perform the co-integration test between the stock market development index and economic growth, (5) to perform the causality test between the Deminiguc-Kunt and Levene 's (1996) stock index and gross domestic product (6) to test the validity of Levine and Zervos's study of stock market index and economic growth with context to Nepal.

This is perhaps the first study of its kind in Nepal that has made attempt to study the stock market development and economic growth by considering the stock market development index of Deminiguc and Levine (1996) and gross domestic product. For the stock index three different ratios (1) market capitalization ratio, (2) concentration ratio and (3) liquidity ratio have been considered as suggested by them.

For the purpose of the study, the necessary data on stock, gross domestic product and other related variables were collected for the period of 1992-2005. Few years' data on the selected variables could not be collected due to unavailability of data and information.

This study used three ratios as suggested by Deminiguc-Kunt and Levene (1996) to conduct the stock index. It employed different tests and analysis for conducting the long run relationship between stock index and economic growth with its selected indicators.

With the purpose of analysis of the impact of stock market on economic growth, different controlled variables are considered. Such variables are undertaken to make

the direction of analysis more clear and realistic. The different trend analysis of stock market and economic growth is useful for providing the rough idea about the economic and stock market situation in Nepal. The percentage change and index is calculated to find the magnitude of data over the period of time. The simple correlation and partial correlation analysis of selected variables are also performed to find the association between the variables. The regression analysis is performed to find the causal association between the different stock market variables and economic growth variables. The Augmented Dicky Fuller (ADF) test is made to find the characteristics of macro economic data. Bivariate co-integration test is done for finding the long run relationship between the stock index and gross domestic product. Finally causality test as suggested by Granger is made to find the further developed time series relationship between the variables. Though the results obtained from this analysis is based on aggregate economic and stock market variables, the empirical results and the conclusions drawn from them should be considered as suggestive rather than absolute (Comincioli, 1996). It is because there are many controversies regarding the data, observation periods, regression analysis, co-integration test and Granger causality tests. There are strengths and weaknesses associated with each methodology used to examine the relation-ship between finance and economic growth.

The summary of major findings of the study is described as follows.

1. GDP is positively related to public investment, public expenses, developmental aid, and stock market development index.

2. The market size is in increasing trend. The primary and secondary stock markets are gradually improving in Nepal. There is growth in markets from various aspects. This suggests that stock market is a surprisingly important source of finance for growth of financial institutions, manufacturing institutions and other sectors. Stock market is the most important source for long-term external finance in Nepal.

3. The increasing trend of market capitalization indicates that there is high public participation in capital market. This shows that there is high return in stock investment than any other sectors.

4. The capital market has low liquidity as compare to Japan, United States, Bangladesh, Chile and Egypt. It means that the volume or size is very low may be due to the fact that there is only one stock market. In additions, markets suffer from the problem of low liquidity.

5. The trend line shows that the liquidity and concentration have fluctuated largely over the past 13 years. This indicates that share price was highly volatile during the study period.

6. There is high concentration ratio. It means that the few companies can dominate the whole capital market easily. Anyone can easily manipulate the price formation process. High concentration ratio refers to the fact that the capital market is still underdeveloped in Nepal.

7. Low liquidity and high concentration in combine reflect that there is high volatility of stock price. It implies that there is high risk associated with investment in shares.

8. There is a significant and positive effect of market capitalization on Gross Domestic Product (GDP) but there is no significant effect of liquidity ratio and concentration ratios on GDP although they have positive signs. This shows that still the Nepalese stock market is underdeveloped.

9. The adjusted R-square for the regression model is very high that is over 90 percent of variability when expenditure is added in the model. When adjusted R-square is very high it is assumed that the explanatory power of the model is considered as good.

10. When the stationary test is analyzed for Gross Domestic Product and Deminiguc-Kunt and Levene ‘s stock market development index then the test states that both the variables have non-stationary time series.

11. When co-integration test is analyzed, it is found that the stock market development index and GDP do not move together in long run. Thus economic development can occur even with underdeveloped stock market and stock market can grow without leading to economic growth.

12. The Granger causality test suggests that there is unidirectional causality from GDP to the stock. However there is no reverse relation from stock to GDP. It reflects that the economic growth of a nation will lead to stock market development rather than the vice versa relation.

13. In the under developing country like in Nepal, stock market is not helping in the economic growth of a nation. This finding does not support Levine and Zervos’ conclusion on developing countries.

5.2 Conclusions

The increasing trend of market capitalization and gross domestic product shows that the primary and secondary stock markets, and economic conditions are gradually improving in Nepal. The empirical result shows that the stock market has not developed enough to effect and push development of various sectors of the economy. Lack of promotion and expansion of economy has led stock market into infancy stage. The result is consistent in Nepalese context that increase in GDP pushes capital market to enlarge and expand.

In the underdeveloped country, like in Nepal, a stock market development is at early stage does not help in economic development of nation. Policymakers should encourage stock market development. They should remove impediments to stock markets, such as tax, legal, and regulatory barriers for its developments. Government must play a more positive role in order to foster stock markets so that economic growth can be gained in coming days.

5.3 Recommendations

Numerical research works, including this particular one, have made the conclusion that capital markets need to be very strong and found to be the cause of economic enhancement of a nation. The economic activities can be boosted by orderly and efficiently functioning of stock market.

Based on analysis of data, the following recommendations are made:

1. Capital market is suffering from low liquidity due to small size of market. Low liquidity hindrances the development of stock market. Government policy must focus on it.
2. The share price was found to be highly volatile during the study period. This revels that the few investors can easily dominate the capital market. Government policy must focus on increasing the stock exchange in other part of country as well.
3. High concentration is not desirable for development of stock market. The government should realize it and act accordingly to accelerate public capital flows, foreign direct investment, increase in remittances, and portfolio investment. Government should attract capital flow and encourage foreign participation.
4. High fluctuation of share price refers to weak regulation of government in stock market. The government should open the stock exchange outside the Kathmandu valley to provide the opportunities to al the investors and facilitate and promote public transaction.
5. Rumor and other misconception are the obstacles for smooth growth of the stock market. Some sensible regulatory measures are needed to prevent the negative effects on the Nepalese stock market.
6. The involvement of institutional investors in Nepalese capital market must be pursued vigorously. Institutional investors often are at the forefront in promoting efficient market practices and financial innovation. They typically favor greater transparency and market integrity in both primary and secondary markets, seek lower transaction cost, and encourage efficient trading and settlement facilities. Insurance houses, banks and other institutional investors

can therefore act as a countervailing force to commercial and investment banks as well as other market intermediaries, forcing them to be more competitive and efficient.

A stock market provides the users of capital a means of acquiring large amounts of financial resources. In addition, a stock market provides a mechanism by which small savers can invest in the economic development of their country. Capital markets are the mechanism by which more productive firms acquire the funds necessary to continue growing and providing the increased productivity that leads to economic development that is reflected in higher gross national income per capita. The interaction between process of economic development and the level of development of the stock market are explored in this paper. There is substantial evidence that capital markets are a necessary part of the economic growth and development process. Developed economies have developed stock markets that reflect the ability of entrepreneurs to raise large sums of money and reflect the markets ability to direct funds to successful entrepreneurs.

As a matter of policy, governments that wish to promote long-term economic growth and development should create a political and economic environment in which capital markets can flourish. In the absence of well-developed capital markets, entrepreneurs are not able to raise the large sums of money needed to sustain growth. In addition, if the allocation of capital function is not performed satisfactorily, then long-term economic growth and development does not happen.

5.4 Further Scope

Though much has been learnt from this research, many issues have still to be explained. The co-evolution of the real and financial sectors of an economy remains a fertile area for investigation. Undoubtedly, the development of financial sectors of an economy is a complex process that is intimately connected to real economic activity. As such, the metamorphosis and transformation of the financial system cannot be fully understood unless it is analyzed in developing country like Nepal. Without recognizing this, it would be difficult to explain how financial institutions evolve and how new financial arrangements emerge. As Levine (1997) emphasis, there is need

for further research into many aspects of financial development, which have so far received relatively little attention. The emergence and expansion of stock markets for economic development is one such aspect. The need for further research is necessary in order to get more evidence regarding the impact of stock markets on economic growth or vice versa by considering different macro economic indicators like interest rates, inflation, money supply, price level, employment and poverty alleviation.

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Selected Variables for Analysis

SN	YEAR	INV (M)	EXP01 (M)	GDP (M)	AID (M)	FDI (M)	MCAP (M)	CONC (RATIO)	LIQDT (RATIO)	STOCK (INDEX)
1	1992/93	19413.6	30897.7	165350	9235.6	13873	4000.00	NA	NA	NA
2	1993/94	21188.2	33597.4	191596	11557.1	4734	13872.00	NA	3.18	NA
3	1994/95	19794.9	39060.0	209976	11249.4	2386	12963.00	NA	8.13	NA
4	1995/96	24980.5	46542.4	239388	14289.0	8032	12295.00	0.411889	1.75	-32.5600
5	1996/97	26542.6	50723.7	269570	15031.9	9347	12698.00	0.381162	3.28	-24.3900
6	1997/98	28943.9	56118.3	289798	16457.1	4336	14289.00	0.383380	1.42	-38.3166
7	1998/99	28531.3	59579.0	330018	16189.0	2146	23508.00	0.354096	6.38	7.4100
8	1999/00	31749.2	66272.5	366251	17523.9	4703	43123.00	0.442204	2.68	2.6830
9	2000/01	37065.9	79835.1	394052	18797.4	6880	46349.41	0.409396	5.06	19.0800
10	2001/02	31482.2	80072.2	406138	14384.8	3731	34703.87	0.381400	4.44	-0.3600
11	2002/03	29033.0	84006.1	437546	15885.5	3572	35240.00	0.415590	1.63	-21.4700
12	2003/04	23095.6	89442.6	414129	18912.4	2144	41425.00	0.449805	5.18	11.8800
13	2004/05	27340.7	102560.4	548485	23657.3	5559	61366.00	0.409285	7.35	38.5200
14	2005/06	29606.6	110889.2	603673	22041.7	7358	96763.70	0.424504	3.56	29.4960
15	2006/07	NA	NA	670589	NA	7389	186301.28	NA	NA	NA
16	2007/08	NA	NA	NA	NA	NA	7909.00	NA	NA	NA

Sign (M) indicates amount in Million and STOCK is stock market development index as suggested by Kunt and Levine (1996).

Appendix II

Descriptive Statistical Analysis of Selected Individual Variables

	INV	EXPN	GDP	AID	FDI	MCAP	CONC	LIQDT	STOCK
Mean	27054.87	66399.76	369103.9	16086.58	5746.000	40425.39	0.405701	4.156923	-0.729782
Median	27936.00	62925.75	366251.0	16037.25	4734.000	29105.94	0.409396	3.560000	2.683000
Maximum	37065.90	110889.2	670589.0	23657.30	13873.00	186301.3	0.449805	8.130000	38.52000
Minimum	19413.60	30897.70	165350.0	9235.600	2144.000	4000.000	0.354096	1.420000	-38.31660
Std. Dev.	4991.287	25376.33	151115.8	4004.395	3173.221	45729.72	0.028544	2.175544	25.49414
Skewness	0.080898	0.217147	0.530296	0.187764	1.042979	2.234632	-0.159171	0.441959	-0.057466
Kurtosis	2.485982	1.919229	2.367687	2.531101	3.836113	7.623226	2.277838	2.080125	1.799996
Jarque-Bera	0.169396	0.791394	0.952921	0.210518	3.156439	27.56570	0.285477	0.881553	0.666059
Probability	0.918790	0.673211	0.620977	0.900091	0.206342	0.000001	0.866981	0.643537	0.716749
Sum	378768.2	929596.6	5536559.	225212.1	86190.00	646806.3	4.462712	54.04000	-8.027600
Sum Sq. Dev.	3.24E+08	8.37E+09	3.20E+11	2.08E+08	1.41E+08	3.14E+10	0.008148	56.79588	6499.511
Observations	14	14	15	14	15	16	11	13	11

Augmented Dickey-Fuller Test of Statistics for GDP and STOCK.

1. Augmented Dickey-Fuller Test of Statistics for GDP by considering levels.

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.131582	0.9954
Test critical values:	1% level	-4.004425	
	5% level	-3.098896	
	10% level	-2.690439	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 14

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 06/24/08 Time: 06:55
Sample (adjusted): 2 15
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.083139	0.073472	1.131582	0.2799
C	7191.862	27163.10	0.264766	0.7957

R-squared	0.096418	Mean dependent var	36088.50
Adjusted R-squared	0.021120	S.D. dependent var	35014.08
S.E. of regression	34642.37	Akaike info criterion	23.87511
Sum squared resid	1.44E+10	Schwarz criterion	23.96640
Log likelihood	-165.1257	F-statistic	1.280477
Durbin-Watson stat	2.676959	Prob(F-statistic)	0.279917

2. Augmented Dickey-Fuller Test of Statistics for STOCK by considering Levels.

Null Hypothesis: STOCK has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.665475	0.4575
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STOCK)
Method: Least Squares
Date: 06/24/08 Time: 07:00
Sample (adjusted): 5 14
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STOCK(-1)	-0.463563	0.294173	-1.665475	0.1537
C	4.466145	6.983348	0.639542	0.5403

R-squared	0.236874	Mean dependent var	6.205600
Adjusted R-squared	0.141483	S.D. dependent var	23.53395
S.E. of regression	21.80566	Akaike info criterion	9.179073
Sum squared resid	3803.894	Schwarz criterion	9.239590
Log likelihood	-43.89536	F-statistic	2.483199
Durbin-Watson stat	2.078622	Prob (F-statistic)	0.153717

3. Augmented Dickey-Fuller Test of Statistics for GDP by considering 1st Difference

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.534718	0.0458
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 09/22/08 Time: 01:28
Sample (adjusted): 3 11
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.235995	0.372039	-2.534718	0.0127
C	45227.59	19512.25	2.317908	0.0536

R-squared	0.611911	Mean dependent var	2778.444
Adjusted R-squared	0.556470	S.D. dependent var	66428.77
S.E. of regression	44240.26	Akaike info criterion	24.42579
Sum squared resid	1.37E+10	Schwarz criterion	24.46962
Log likelihood	-107.9160	F-statistic	11.03711
Durbin-Watson stat	1.913741	Prob(F-statistic)	0.012726

4. Augmented Dickey-Fuller Test of Statistics for STOCK by considering 1st Difference.

Null Hypothesis: D(STOCK) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.627448	0.0298
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STOCK,2)
Method: Least Squares
Date: 09/22/08 Time: 01:33
Sample (adjusted): 3 11
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(STOCK(-1))	-1.337169	0.368625	-3.627448	0.0084
C	0.080942	0.087961	0.920208	0.3881

R-squared	0.652750	Mean dependent var	-0.021149
Adjusted R-squared	0.603143	S.D. dependent var	0.396864
S.E. of regression	0.250011	Akaike info criterion	0.258506
Sum squared resid	0.437538	Schwarz criterion	0.302333
Log likelihood	0.836725	F-statistic	13.15838
Durbin-Watson stat	2.072161	Prob(F-statistic)	0.008426

Appendix –VII

Co-integration test for GDP and STOCK

Date: 06/24/08 Time: 07:19
Sample (adjusted): 6 14
Included observations: 9 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP STOCK
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.481330	7.601666	15.49471	0.5089
At most 1	0.171504	1.693287	3.841466	0.1932

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.481330	5.908379	14.26460	0.6250
At most 1	0.171504	1.693287	3.841466	0.1932

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Granger Causality Test for GDP and STOCK

Pairwise Granger Causality Tests
Date: 06/24/08 Time: 07:38
Sample: 1 16
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDP does not Granger Cause STOCK	9	1.141	0.39877
STOCK does not Granger Cause GDP		1.48079	0.33015

Pairwise Granger Causality Tests
Date: 09/22/08 Time: 01:51
Sample: 1 15
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability
GDP does not Granger Cause STOCK	8	22.840	0.15234
STOCK does not Granger Cause GDP		2.6733	0.41597