Nexus between Financial Sector Development and Economic Growth: Some Empirical Observations

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Abstract

This paper examines the relationship between financial sector development and long run economic growth using cross-sectional and panel data regressions models for selected 58 countries depending upon two criteria i.e. level of income and rate of availability of data for the period of 1980-2000. Cross-country and panel time variation specifics as well as endogeneity problems have been addressed in an attempt to explain the relationship between financial sector development and sustained long run economic growth in the selected sample countries. It presents evidence based on cross-sectional model, Generalized Least Squares, VAR model and Granger Causality Tests. This empirical study has two main findings. First, the empirical evidences provide clear support for the hypothesis that there exists positive and significant relationship between financial sector development and long run economic growth. Second, the results support the existence of bi-directional causal relationships between financial sector development and long run economic growth.

Background

The crucial role of financial sector development in economic growth is a major issue among the scholars, economists, researchers and policymakers around the world. For almost a century, economists have been debating the role of the financial sector development in long run economic growth. A pertinent question frequently asked in the international fora these days goes line the following. Are financial systems simply casinos where the rich people come to place their bets, or do the services provided by the financial system affect the rate of long-run economic growth? Economists disagree about the impact of finance on growth (Demirgüç-Kunt and Levine, 2008). Many Development Economists do not even consider financial sector worth discussing. A collection of essays by the *Pioneers of Development Economics*—including three Nobel Prize winners in economics—does not discuss finance (Meier & Seers, 1984). Leading textbooks on economic growth literature also ignore the relationship between financial sector and

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economic growth (Jones, 1998; Weil, 2005). At the other extreme, Nobel Laureate Merton Miller says "that the financial markets contribute to economic growth is a proposition almost too obvious for serious discussion" (Miller, 1998). As a third view, Nobel Laureate Robert Lucas (1988) holds that the role of financial sector in economic growth has been "over-stressed" by the economic growth literature. Resolving this debate will affect the intensity with which scholars, researchers and policymakers attempt to identify and adopt appropriate financial sector policies in economic growth.

Theory in finance-growth relationship provides ambiguous predictions concerning the question of whether financial development exerts a positive and causative impact on long-run economic growth. Theoretical models show that financial instruments, markets and institutions may arise to mitigate the effects of information and transaction costs. In emerging to ameliorate market frictions financial arrangements change the incentives and constraints facing by the economic agents. Thus, financial systems may influence saving rates, investment decisions, technological innovation and hence, the long-run economic growth rates. Even putting aside causal issues, a host of theoretical models illustrate the reductions in financial market frictions that increase expected rates of return and improve risk diversification opportunities could increase or decrease economic growth rates depending on the general equilibrium effects on aggregate saving rates. Furthermore, a comparatively less well developed theoretical literature examines the dynamic interactions between That a modern, efficient financial sector is a powerful contributor to economic growth and development is we thinks something that all of economist, researcher, students and policy makers would instinctively agree on (Demirgüç-Kunt & Levine, 2008). The importance of well-functioning financial institutions and their role in promoting and enabling capital accumulation and economic development, has been understood since at least the 19th century if not earlier, and even if one only limits oneself to just the last 50 years the literature on the subject is extensive– indeed, having researched it for this talk, It might almost say exhaustive (Nugée, 2007). One of the thoughts that will emerge from this analysis is that, while a modern efficient financial sector is probably a necessary condition for broad-based economic development and prosperity of society and nation, it is certainly not a sufficient condition. No country that wishes to pursue economic growth and prosperity, and wishes to give its citizens the opportunity to develop to their full potential, can do so in isolation of the global economy and the international financial sector has a crucial role to play in the interaction of the national and global financial systems. Since Schumpeter (1912) put forward arguments pointing at the productivity and growth enhancing effects of the services provided by a well developed financial sector, a considerable amount of theoretical and empirical literature has emerged. Initially this literature focused on the question whether the financial sector plays a causal role in economic growth or if financial intermediaries merely originate from rapid industrialization. Goldsmith (1969) stressed the propulsive role the financial sector can play in the process of economic growth. Even though this pioneering work broke a ground to change the direction of thinking, the causality question has remained an important issue in the theoretical debate ever since. In the last two decades a wide range of studies has been devoted to huge statistical analysis to elucidate

the finance-growth relationship (Levine, 2005). These studies have been able to establish that the financial development and economic growth are clearly related. Yet, the institutional channels is inadequately conceptualized and poorly understood. Even the direction of causality remains unresolved theoretical issues. It might partly be attributed to the lack of a generalized or unifying theory, and partly to the myopic way conventional economics approach the issue. On the other hand, extremely opposite view is expressed by some economist "that financial markets contribute to economic growth is a proposition almost too obvious for serious discussion". As a third view hold that the role of finance in economic growth has been "over-stressed" by the economic growth literature. Despite all these differing views, literature on finance growth nexus is growing and more and more economist, researchers and policymakers are attracting toward it. Thus there is heterogeneity of views about the role of finance in economic growth. The whole array of literature on finance-growth relationship can be divided into two broad categories: 'Supply-leading' hypothesis and 'Demand following' hypothesis. According to 'Supply leading' hypothesis finance is a contributing factor in economic growth. Financial sector transfers resources from the traditional low-growth sector like agriculture and land rents to modern high growth sectors such as industry and service sector and promotes and stimulates entrepreneurial responses in these modern sectors. This implies that creation of financial institutions and the supply of financial services are well in advance of demand for them. The findings of McKinnon (1973), Shaw (1973), King & Levine (1992, 1993a, 1993b, 1993c) support this proposition. Second group of literature, dubbed as 'Demand-following' hypothesis, views finance as dependent upon economic growth, that is, the creation of modern financial institutions and financial services are a response to the demand for these services by investors and savers in the real economy (Patrick, 1966). The financial system adapts itself to the financial needs of the real sector and fits in with its autonomous development, playing a relatively passive role in the growth process (Berthelemy & Varoudakis, 1996).

Objective of the Paper

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

1. To examine if financial development has causal effects on economic growth of the selected countries under consideration in the sample.

2. To analyze cross sectional and longitudinal i.e. time series analysis of relationship between financial sector development and economic growth of the sampled countries.

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

Survey of Exiting Growth-Finance Literature

The Role of the Financial Sector in History

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

Moving forward, there are records of banks in Egypt in the Ptolemaic era, and bankers' cheques and drafts were in existence as early as 250 BC (William & Rouwenhorst, 2005). It has recognizable financial sector developing, and Egypt's rulers, including of course their famous Queen Cleopatra, made good use of it to maximize their country's economic potential– the wealth of Cleopatran Egypt is a constant refrain in commentaries by late first century BC Roman writers. As moving closer to the modern era, China takes the centre stage. China, which seems to have invented so much that was later "discovered" by the West– such as printing, gunpowder and so on– was the first country to make use of paper money, around 1000 AD, and later in the 13th century it

extended the idea into that of fiat money: paper that had value because the government declared that it did rather than because of any explicit backing by gold or other "real" assets (Federal Reserve Bank of Minneapolis, 2008). But again in keeping with so many of their other innovations– somehow China did not make the next leap forward and create genuine securities, paper assets which can be traded between market participants. All of these societies were successful and all of them clearly prospered economically. And it could be mentioned that others like the Romans, whose military and economic successes occurred despite financial arrangements which were really quite primitive in the 1ˢᵗ century BC, certainly less developed than those in contemporary Egypt for example. So the lack of a formal financial sector as generally understood the term today is clearly no barrier to a society's success, either militarily or in the economic sphere. But it is also significant and worth noting that wealth in all these societies was narrowly held and economic development took place at a relatively slow pace: somehow the spark of widespread and rapid economic growth and development across all levels of society eluded them. It is to this, and the role of the financial sector in enabling the creation of the mass prosperity which is the hallmark of the modern era.

The Role of a Modern Financial Sector

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

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

ii)   Secondly, a mechanism to transfer economic resources across time and space. This enables individuals to separate the life-time pattern of income (which is typically highest in the period from aged 40 to 60) from that of expenditure (which is typically highest when the individual is young and establishing himself, and old, when he or she is drawing down his savings). It also enables a society as a whole to allocate resources so that savings flow to the most productive industry or region of the economy;

iii) Thirdly, a mechanism to share risk. Risk-sharing benefits both the individual investor, who can spread his investments across many enterprises, and borrowers, who can obtain finance for projects that would be too risky for a single investor but become acceptable when the risk is borne by many. Investment diversification, insurance and hedging are all classic example of risk-sharing;

iv) Fourthly, a mechanism to reduce the cost of information. A modern financial system is a huge information exchange– on the price of assets, on the creditworthiness of economic agents, on the prospects of success for a given economic venture. The financial sector processes and analyses this information, and makes it widely and cheaply available to market participants, an essential element of ensuring that society channels its resources into their most efficient usage;

v) Lastly, and underpinning all of the above, a mechanism for the clearing and settlement of payments and financial claims, without which the exchange of goods and services would be impossible.

The volume of payments in a modern economy is extraordinary. Just as an example, in the USA alone the annual total value of payments through the financial system approaches $1,000 trillion, or nearly 100 times of its GDP (Fedwire, 2006). None of this is very controversial, and indeed almost every country in the world has much of this infrastructure in place, at least notionally and at least for the formal sector of the economy, however small that may be in some developing countries. But in some countries, the formal sector of the economy and the role of the financial sector in supporting and enabling it, is indeed extremely small. What is it therefore that makes some financial sectors vibrant and successful, while others languish and add very little to the national economic development? Empirical studies show that the assets of financial intermediaries and the size of capital markets both tend to be larger in relation to GDP in richer economies than they are in poorer ones. Size, however, is not in itself the main driver of the success of a financial sector. The former Soviet Union had a very large savings bank system, but it contributed little to the development of the Soviet economy. Rather, the critical factor in a well-functioning financial sector is not so much its size as its liquidity. While the size of the financial sector tends to be larger in relation to GDP in richer economies than in poorer ones, turnover in rich economy markets relative to GDP tends to be an order of magnitude larger still– as the figures quoted earlier for payments in the USA show. In a Working Paper by economists Ross Levine and Sara Zervos, published by the World Bank, the authors find that stock market liquidity, as measured by stock trading relative to the size of the market and economy, is positively and significantly correlated with current and future rates of economic growth, capital accumulation and productivity growth, even after controlling for economic and political factors (Ross & Sara, 1996). On the other hand, they also find that stock market size, volatility, and integration *per se* are not robustly linked with growth. This emphasis on liquidity illustrates one of the most important features of a successful financial sector: the

ability of participants to access their assets on demand. Critics of financial markets often argue that much– maybe most of this turnover is "speculative froth", unconnected to the real economy: traders trading with themselves, to the benefit only of themselves. But without this entire turnover, this financial hyperactivity, the financial sector would not be able to absorb and meet the demands of those whose transactions are connected to the real economy. One cannot say that some of the financial activity is good but other parts of it are not. It is the whole which generates the liquidity that modern economies need. Put simply, if people cannot be sure of being able to get their money out of a financial commitment when they need to, they will be much more reluctant about putting their money into it in the first place. This is not to say that all financial investments have to provide immediate access and daily liquidity. There will always be investors who are able to make a longer term commitment. But investments and markets which do not offer adequate liquidity will struggle to attract finance, and will find that what finance they do attract demands a higher price. So, to Merton and Bodie's five functions of a modern financial sector it can be added a sixth: to be successful, a financial sector must inspire confidence in participants that their assets will at all times be safe and available (Nugee, 2007).

Importance of Financial Development in Economic Growth

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

It is true that many Asian countries achieved significant economic growth rates despite shortcomings in their financial systems. However, this growth has not been sustainable, as the Asian financial crisis showed. In fact, growth exacerbated existing problems of financial systems, when external and internal risk management and control systems failed to keep pace with the rapid expansion of credit in the economy. The crisis exposed the weaknesses of regional financial systems, which included the absence of well developed domestic capital markets and severe deficiencies in financial governance practices. Together with unsustainable foreign exchange rate policies, these weaknesses were mainly responsible for creating highly leveraged corporate sectors, whose long term domestic investments were financed with short-term foreign-currency denominated bank loans. When the sudden loss of confidence in these economies led to a sharp depreciation of their overvalued currencies, resulting balance sheet problems for banks and corporate sectors then triggered a collapse in output.

The Theoretical Review

There is a debate over a role of financial systems in economic growth. Some people think that it is a simply casino where the rich come to place their bets. Other thinks that

the services provided by the financial system affect the rate of long-run economic growth. Economists disagree about the impact of financial intermediation on economic growth. Alternative views on the links between financial intermediation and economic growth focus on the key functions of financial systems in the saving-investment-growth nexus. These include acting as an effective conduit;

- Firstly for channeling funds from surplus to deficit units by mobilizing resources and ensuring an efficient transformation of funds into real productive capital.

- Secondly, financial intermediation transforms maturity of the portfolios of savers and investors, while providing sufficient liquidity to the system as the need arises.

- The third function is risks reduction from the system through diversification and techniques of risk sharing and pooling (Nissanke & Stein, 2003).

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

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

borders. It is identified five main channels, which foster economic efficiency in an economic and consequently may have beneficial effects on output growth. These are:

i)   Elimination of transaction costs;

ii)   Improved allocation of common market capital;

iii)   Intensified cross-border competitive pressures;

iv)   Higher efficiency of corporate ownership; and

v)   Increased output as a result of reduced and converged inflation rates.

Inter-temporal borrowing/lending model as applied to cross-border capital trading has been used to demonstrate that financial globalization/integration can be beneficial especially to developing countries. The argument is that as financial integration allows capital to seek out its highest rewards, it provides developing countries opportunities for higher investment as well as consumption smoothing and insurance against shocks. A similar line of argument based on the model of global portfolio diversification is used to emphasize the welfare gains associated with global risk sharing and shifting which is made possible from portfolio diversification through internationally integrated markets. The model predicts that international asset trading allows each country to hold a globally diversified portfolio of risky investments, resulting in substantial risk reduction through sharing. This is claimed to lead to an increase in world economic growth and national welfare. The following quotation sums up the theoretical predictions about the financial intermediation gains from economic integration. As a result of cross-border transactions, therefore, a nation's resident can enjoy a higher standard of living-a time path of consumption that is higher, better adapted to their particular preferences, and not rigidly tied to the peculiarities of their geographical circumstances-than would otherwise be possible. What is true for the individual nation is equally true for the world as a whole. Cross-border transactions among countries permit a more efficient allocation of world resources than could otherwise occur and thereby increase world consumption possibilities.

The theoretical underpinnings of the relationship between financial sector development and economic growth can be traced back to the work of Schumpter (1912) and, more recently, to Patrick (1966) and Goldsmith (1969). Patrick (1966) focused the causal relationships between finance and growth. Patrick categorizes the possible directions of causality as supply-leading or demand following. Under the supply-leading hypothesis, the development of financial institutions and their related services induce real investment and economic growth. Financial sector development therefore leads economic growth. Alternatively, under the demand-following hypothesis, the financial sector responds to increasing demand for their services resulting from the growing real economy. Causality runs from economic growth to financial development. In addition, Patrick proposes his stage of development hypothesis. Under this hypothesis, there is interaction between the two phenomena discussed above; the causality between finance and growth changes over time as the economy develops. At early stages of economic development, financial

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

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

- First, developed financial system encourage the mobilization of savings from many disparate savers and affect economic growth by improving the efficiency with which those savings are used and increasing the amount of capital and productivity.

- Second, well-developed financial sector can help to screen and monitor borrowers. Better screening and monitoring of borrowers can lead to more efficient resource allocation. Third, developed financial sector help to share risk associated with high-quality investment. Improvement on risk-sharing can enhance savings rates and promote innovation, which will ultimately promote economic growth.

Review of Empirical Studies and Methodology

A large numbers of empirical research findings identified the relationship between financial sector development and economic growth using regression models both time-

series and cross-section data. This section discusses some of the empirical studies that examine the finance growth relationship. The focus of most recent empirical studies has been to determine whether there is a significant causal link running from financial development to economic growth.

A study was undertaken by Goldsmith (1969) in which he examined the correlation between financial intermediation and economic growth and whether the mixture of markets and intermediaries operating in an economy influences economic growth. He concluded that a rough parallelism can be observed between economic and financial development if periods of several decades are considered and using data from 35 countries for the period 1860 to 1963, he found evidence of a relationship between economic and financial development over long periods, and that periods of rapid economic growth have often been accompanied by an above average rate of financial development. However, he did not take a stand on whether financial development causes economic growth.

Similarly, the application of broad cross-country growth regressions can also be examined to the study of the relation between finance and growth. These studies aggregate economic growth over long periods, a decade or more, and assess the relationship between long-run growth and measures of financial development. King and King and Levine (1993a, b, c) build on earlier cross-country work by Goldsmith (1969). In particular, King and Levine (1993a,b,c) more than double Goldsmith's (1969) sample of countries, study growth over a 30-year horizon, and systematically control for many possible determinants of economic growth such as initial income, educational attainment, inflation, black market exchange rate, government spending, openness to trade, and political instability. Furthermore, they examine whether financial development is associated with productivity growth and capital accumulation, which are two channels through which finance may influence economic growth. King and Levine (1993b) studied 77 countries over the period 1960–89. To measure financial development, King and Levine focus on equals the size of the financial intermediary sector. It equals the liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. An important weakness with this measure of financial development is that it measures the size of the financial intermediary sector. It may not, however, represent an accurate proxy for the functioning of the financial system. It may not proxy for how well banks research firms, exert corporate control, or provide risk management services to clients. King and Levine (1993b) experiment with alternative measures of financial development that are designed to gauge who is conducting credit allocation (that is, whether it is banks or the government), and to where the credit is flowing (that is, to the private sector or to the government and state-owned enterprises). They obtain similar results with these alternative indicators of financial development (La Porta et al., 2001).

Similarly, building on Goldsmith's work, Trabelsi (2002) examines the empirical relationship between financial intermediation and long run economic growth. They found that there is a strong positive relationship between different financial development

indicators and measures of economic growth. However, Trabelsi (2002), in panel regressions, found no clear positive effect of financial development on economic growth. He tries to explain this paradoxical result by highlighting the importance of the private sector in the allocation of resources by financial markets.

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

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

Finally, he goes beyond the issue of causality and reexamines the relationship between financial development and growth by allowing this relationship to be heterogeneous across countries. He finds that the effects of financial development differ considerably across countries, with no obvious pattern related to geographic location, the level of economic development or institutional characteristics. Christopoulos and Tsionas (2004) use panel co-integration analysis to examine whether a long run relationship between financial development and economic growth exists for 10 developing countries over the period 1970–2000. Their findings are supportive to a unique co-integrating vector between growth, financial development, investment share, and inflation, and to unidirectional causality from financial depth to growth. Following Christopoulos and Tsionas (2004), Apergis, Filippidis and Economidou (2007) examines whether a long-run relationship between financial development and economic growth exists for a dynamic heterogeneous panel of 15 OECD and 50 non-OECD countries over the period 1975–2000. Their findings support the existence of a single long-run equilibrium relation between financial deepening, economic growth and a set of control variables. Further, the evidence points to a bi-directional causality between financial deepening and growth.

Empirical Strategy

Variables and the data Sources:

In this study, the approach of standard growth regressions including the cross-country regressions and panel regressions are undertaken. The data series include 58 countries and the time period from 1980 to 2000. Table 1 gives the list of sampled countries. The countries are selected including high income, middle income and low income countries.

Table: 1 List of the Sampled Countries

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

* *LIC = Least Income, LMC = Lower Middle Income,*
  UMC = Upper Middle Income and
  HIC = High Income countries

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

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

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

Table: 2 List of Variable with Symbols, Definitions and Data Sources

Variable Under Consideration	Variable Symbol	Definitions of Variable	Source of Data
Log of GDP Per Capita	Lny	Log of Real GDP Per Capita Expressed in 2000 International Dollar	Penn World Table 6.2
Investment	IR	Real Domestic Investment as shared of real GDP	Penn World Table 6.2
Human Capital	HC	Secondary enrolment as percent of population aged 15 and above	Barro and Lee (2007)
Government Expenditure	GE	Government expenditure share in real GDP	Penn World Table 6.2
Openness	O	Import plus export relative to GDP	Penn World Table 6.2
Inflation	Inf	Annual percentage change in CPI	IMF online data
Bank Credit	BC	Credit by deposit money banks to the private sector divided by GDP	World Development Indicators 2010
Private Sector Credit	PC	Credit by deposit money banks and other financial institution to the private sector divided GDP	World Development Indicators 2010
Liquid Liabilities	LL	Currency plus demand deposit and interest earning liabilities of banking and non-banking financial intermediaries divided by GDP, M3/GDP	World Development Indicators 2010

The data for real GDP per capita growth, investment, government expenditure and export plus imports are obtained from Penn World Table 6.2. Data for human capital are used from Barro and Lee (2000) while data for financial variables and inflation rate are

from World Development Indicators, 2007 of IMF online data service. Table 2 shows the list of proxy variables with abbreviations and definitions and corresponding data sources.

Cross-Sectional Data Analysis

The study started with the analysis by exploiting cross-sectional variation in the total data sets. Given the various theories on the relationship between financial development and economic growth and augmented Solow model of by Mankiw, Romer and Weil in 1992 which derives the estimated equation from the neoclassical growth model relating the growth rate of real GDP to investment as a ration of GDP and growth rate of population, I used the following basic policy and institutions augmented cross-country growth model to examine the relationship between finance and growth: In line with previous empirical studies, I estimated the base regression for cross-sectional evidence and financial variables augmented in the subsequent specification. The estimations were carried out using ordinary least squares (OLS) and the standard errors were computed using the White robust procedure.

Panel Data Analysis

Panel Unit Root Tests

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

Panel Co-integration Analysis

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

Panel Estimation

Given our all variables are not co-integrated; there is no need to adopt co-integration procedure because the use of co-integration is only valid for variables that are non-stationary before differencing. If so, it has been used Generalized Least Squares (GLS), and a Vector Auto-regression (VAR) framework to investigate the nature of relationship financial development and economic growth. The GLS utilizes the cross-sectional weights for correcting cross-sectional heteroskedasticity where as the GMM approach takes differences to eliminate country-specific effects and thereby remove omitted variable bias,

and solves the issue of endogeneity using lagged levels of the regressors as suitable instruments. This approach is taken from Levine et al. (2000). The VAR approach has been employed to capture the long-run relationship between the variables.

Granger Causality Test

GLS and GMM estimator provide relevant information only on the dependence of the one variable on the other variables. This relationship does not necessarily imply causation. The grander causality test procedure is adopted to fill the gap in asserting whether causality exists between financial development and economic growth. The following regression models are used to conduct Granger causality test (Islam, 1998).

The Model

$$g_{y_i} = \alpha_o + \sum_{k=1}^{k=n} \alpha_k \left(X_i^k\right) + FDI_i + \varepsilon_i \quad \text{.....................} 1$$

Where,

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

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

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

i = error term

$$\Delta \ln Y_{i,t} = \Delta \beta \ln Y_{i,t-1} + \sum_{j=1}^{n} \beta_j \Delta X_{i,t}^j + \theta \Delta FDI_{i,t} + \Delta \varepsilon_{i,t} \quad \text{..............} 2$$

Where,

Yi,t is the log of real GDO per capita,

FDIi,t is a measure of financial development indicator

Xi,t is a set of control variables, and

i,t is the error term.

$$\ln Y_{i,t} = \partial \ln Y_{i,t-1} + \gamma FDI_{i,t-1}^* + \sum_{j=1}^{n} \partial_j \Delta X_{i,t-1}^j + v_{i,t} \quad \text{....}3$$

$$FDI_{i,t} = \phi FDI_{i,t-1} + \phi \ln Y_{i,t-1} + \gamma + \sum_{j=1}^{n} \phi \Delta X_{i,t-1}^j + \xi_{i,t} \quad \text{.........}4$$

Where, Xt−1 is the vector of control variables in the model.

Empirical Evidences

Summary of Statistics and Facts

Summary statistics for all variables used in the study are given in Table 3. These statistics refer to a panel with observations kept in yearly basis. The table suggests that the most of variability occurring in the data between-countries, yet some variables

including the two indicators of financial development also have large within-country variations. Over the sample period from 1980 to 2000, growth rates in the sampled countries have been between -18.5 percent to around 18.5 percent and the mean growth rate for all the countries is 1.7. The average investment in the sample countries was as low as 2.3 percent and as high as 43.8 percent. Similarly, the mean value of the human capital development for all the countries is 5.9. Inflation rate averaged around 13.8 percent and public spending averaged 19.0 percent of GDP. There is large variation in accumulation of human capital measured as the average years of schooling aged 15 and over.

Table: 3 Summary of Statistics

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

Cross-Sectional Results

The pair-wise correlations matrix for the variables under consideration is given in Table 4, using both cross-section and panel data. All signs are as expected: the growth rate of GDP per capita is positively correlated with the level of human and physical capital, the degree of openness and all indicators of financial development. In addition, the level of investment, on an average is positively correlated with the level of financial development, whereas a high level of inflation appeared to correlate negatively with the size of the financial sector development.

Table: 4 Pair-Wise Correlation Matrices

a) Cross Section Data

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

b) Panel Data

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

Table 5 reveals the basic result of cross-country regressions analysis. The first regression uses a mean real GDP growth rate as a dependent variable and real GDP per capita in 1980 and control variables as independent variables. This basic model performs well: these six variables statistically explain 54.9 percent of the cross-country variation in economic growth over the 1980-2000 sampled years, and all of the variables have expected sign and five of them are statistically significant. Regressions no. 2 to no. 4 in Table 5 summarizes the results of cross-country model augmented by three financial

variables, one at a time. The coefficients on financial variables are in expected direction of relationship however they are not statistically significant. Thus, this study does not find any evidences of positive impact of financial development on economic growth in cross-sectional model in given data set.

<div align="center">

Table: 5 Result of the Regression of Cross Section Model

</div>

Independent Variables:	Dependent Variable: Growth			
	Regression no 1	Regressionn no 2	Regression no 3	Regression no 4
Constant	1.910	1.680	1.54	0.077
	(2.56)	(2.78)	(2.7)	(3.25)
In Y 80	-0.0003*	-0.0003*	-0.0003*	-0.0003*
	(0.00001)	(0.00006)	(0.00006)	(0.00004)
Population Growth	-1.006*	-0.99*	-0.99*	-0.90*
	(0.321)	(0.33)	(0.328)	(0.308)
Log of Investment as % of RGDP	1.57*	1.56*	1.49*	1.41*
	(0.517)	(0.55)	(0.48)	(0.48)
Log of Human Capital	1.06*	-1.02*	0.99**	0.91**
	(0.465)	(0.47)	(0.48)	(0.48)
Log of Measure of Openness	0.810**	0.82**	0.84**	0.792**
	(0.38)	(0.39)	(0.38)	(0.33)
Log of Government Expenditure	-0.280	-0.270	-0.260	-0.130
	(0.54)	(0.54)	(0.54)	(0.58)
Inflation	-0.05*	-0.04*	-0.05*	-0.04*
	(0.017)	(0.02)	(0.016)	(0.01)
Log of Bank Credit		0.070		
		(0.45)		
Log of Private Credit			0.148	
			(0.39)	
Log of Liquid Liabilities				0.490
				(0.51)
Adjusted R-squarred	0.549	0.541	0.541	0.548
SER	1.130	1.129	1.138	1.133
F-Statistic and p-values in the parentheses for overall significance of coefficients	10.91 (0.000)	11.245 (0.000)	11.142 (0.000)	10.142 (0.000)
D-W Statistic	1.990	2.001	2.001	1.890
Number of observation	58	58	58	58

Note: Stadrd errors are reported in parentheses and significance at the 1% and 5% are denoted respectively by "*" and "**".

Panel Data Evidence

Panel Unit Test Results

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

Table: 6 Panel Unit Root Tests

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

Panel Co-integration Results

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

Table: 7 Johansen Co-integration Tests

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

Trace test indicates no co-integration at the 0.05 level

Panel Estimation Results

The results of the GLS with cross-section weights and fixed effects are reported in Table 8. The table also includes p-values for the coefficient estimates. The estimates associated with the financial variables are positive and highly significant, suggesting that the exogenous component of financial development accelerates economic growth. The remaining control variables except human capital also are with correct sign and high significance. However, human capital variable is insignificant. Based on the estimation results of the fixed effects, the adjusted R2 is around 0.31, which shows that approximately 31 percent variation in growth is explained by the independent variables.

Table: 8 Results of GLS Regression (Cross-section Weights)

Independent Variables	Dependent Variable: Growth					
	(1)		(2)		(3)	
	Coefficients	p-values	Coefficients	p-values	Coefficients	p-values
Investment	0.1528	0.0000	0.1774	0.0000	0.1459	0.0000
Human Capital	0.1535	0.3768	0.2630	0.1340	0.1636	0.3527
Openness	0.0248	0.0007	0.0295	0.0000	0.0214	0.0039
Government Expenditure	-0.1869	0.0000	-0.2051	0.0000	-0.1769	0.0000
Inflation	-0.0641	0.0000	-0.0659	0.0000	-0.0601	0.0000
Bank Credit	0.0253	0.0000				0.0005
Private Credit			0.0331	0.0000		
Liquid Liabilities					0.0216	0.0005
Adjusted R-squared	0.306		0.317		0.293251	
SER	3.466		3.453		3.503784	
D-W Statistic	2.047		2.047		2.053487	
N =	1160		1160		1160	

Note: p-values are reported in parentheses.

Table 9 reports the results based on VAR (1). The estimated coefficients of the financial variables are all positive and statistically significant. It implies that lags of financial development contribute to growth. However, the coefficients on the lags of growth are not statistically significant. It implies that there is evidence of long run relationship working from financial sector development to growth.

Table: 9 Results of Vector Autoregression Estimates
(Only results of two equations are reported)

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

Note: t-statistics are reported in [ ].

- The findings of the study certainly point out to the need for further research on the topic of finance-growth relationship. Collection of better-quality and more extensive indicators of financial development, better econometric technique to incorporate non-linear relationship, and extension of the model to incorporate important inter-linkages between domestic and international financial system would be a fresh start for further research. Moreover, much remains to be done on examining are the determinants of financial sector development and how precisely it can be made financial sector development contributing to the pro-poor growth and distribution in society.

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

References

Hassan, A. F. M. K., & Islam, M. R. (2005).Temporal causality and dynamics of financial development, trade openness and economic growth in vector auto regression (VAR) for Bangladesh, 1974-2003: Implication for poverty reduction. *The Journal of Nepalese Business Studies*, II(1).

Apergis, N., Filippidis, I., & Economidou, C. (2007). Financial deepening and economic growth linkages: A panel data analysis. *Review of World Economics*, 143 (1), 179-198.

Bencivenga, V. R., & Smith, B. D. (1993). Some consequences of credit rationing in an endogenous growth model. *Journal of Economic Dynamics and Control*, 17, 97-122.

Bencivenga, V., & Smith, B. (1991). Financial intermediation and endogenous growth. *Review of Economic Studies*, 58, 195-209.

Bhurtel, B. P. (2010). Finance-growth relationship paradox. *Republica Daily*. Retrived from http://www.myrepublica.com/portal/index.php?action=news_details&news_id =16995

Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit roots and cointegration tests. *Journal of Development Economics*, *73* (1), 55-74.

Demirgüç-Kunt, A., & Levine, R. (2008). *Finance, financial sector policies, and long-run growth*. The Commission on Growth and Development, Working Paper Series No. 11.

Duncker & Humblot (1934). *The theory of economic development*. (English translation) Cambridge, MA: Harvard University Press.

Favara, G. (2006). An empirical reassessment of the relationship between finance and growth. HEC, University of Lausanne.

Federal Reserve Bank of Minneapolis (2008). Public information website. For the Chinese introduction of fiat money.

Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98, 1076–1107.

Goetzmann, W. N., & Rouwenhorst, K. G., (eds.) (2005). *The origins of value:The financial innovations that created modern capital markets*. International Center for Finance.

Goldsmith, R. W. (1969). *Financial structure and development*. New Haven, CT: Yale University Press.

Islam, M. N. (1998). Export expansion and economic growth: Testing for co-integration and causality. *Applied Economics*, 30, 415-425.

Jones, C. (1998). *Introduction to economic growth*. New York: Norton.

King, R. G., & Levine, R. (1993a). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108: 717-738.

King, R. G., & Levine, R.(1993b). Finance, entrepreneurship, and growth: Theory and evidence. *Journal of Monetary Economics*, 32: 513-542.

King, R. G., & Levine, R. (1993c). Financial intermediation and economic development. *Financial Intermediation in the Construction of Europe*, (Eds).

King, R. G., & Levine, R. (1993a). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108, 717–38.

King, R. G., & Levine, R. (1993b). Finance, entrepreneurship, and growth: Theory and evidence. *Journal of Monetary Economics*, 32, 513–42.

King, R. G., & Levine, R. (1993c). Financial intermediation and economic development. *Financial Intermediation in the Construction of Europe*, C. Mayer and X. Vives,(Eds) London Centre for Economic Policy Research, 156–189.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1999). Corporate ownership around the world. *Journal of Finance*, 54, 471–517.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46, 31-77.

Levine, R., & Sara, Z. (1996). *Stock markets, banks, and economic growth*. World Bank Policy Research Working Paper No. 1690.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3–42.

Mattessich, R. (1998). Recent insights into Mesopotamian accounting of the 3rd millennium B C. *The Accounting Historians' Journal*, June.

McKinnon, R. I. (1973). *Money and capital in economic development*. Washington, D.C.: Brookings Institution.

Meier, G. M., & Seers, D. (1984). *Pioneers in development*. New York: Oxford University Press.

Merton, R. C., & Bodie, Z. (1995). A Conceptual framework for analyzing the financial environment. *The Global Financial System: A Functional Perspective*. Harvard Business School Press.

Merton, R. C. (1987). A simple model of capital market equilibrium with incomplete information. *Journal of Finance*, 42, 483–510.

Miller, M. H. (1998). Financial markets and economic growth. *Journal of Applied Corporate Finance*, 11, 8–14.

MoF (Ministry of Finance) (2009). *Economic survey*. Kathmandu: MoF.

Nugee, J. (2007). The role of the financial sector in economic growth and development. *State Street Global Advisors Newsletter,* June.

NRB (Nepal Ratra Bank) (2009). *Annual report*. Kathmandu: Nepal Ratra Bank.

Muhammad, P. H. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development Cultural Change*, 14, 174–189.

Roubini, N., & Sala-i-Martin, X. (1992). Financial repression and economic

growth. *Journal of Development Economics*, 39, 5–30.

Schumpeter, J. A. (1912). *Theorie der wirtschaftlichen Entwicklung*. Leipzig.

Shaw, E. S. (1973). *Financial deepening in economic development*. New York: Oxford University Press.

World Bank (2009). *World development report*. Washington DC: World Bank.

World Economic Forum (2010). *Global competitiveness index*. Retrieved from http://www.allcountries.org/ranks/global_competitiveness_index_2009-2010.html