ROLE OF FINANCIAL SYSTEM ON INDIAN ECONOMIC GROWTH

A STUDY THROUGH CANONICAL CORRELATION

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ABSTRACT

Maiden attempt is made to study the role of financial system on the economic growth in India. Canonical correlation technique was used to study the relationship. It was found that there is perfect and significant relationship between the two sets considered in the study. Care should also be taken that some of the variables like size of the stock market and bank deposits considered in the study are not influencing the economy positively and significantly.

INTRODUCTION

Financial systems a set of complex and also closely intermixed financial institutions, markets, instruments, services, practices, procedures, etc. Financial system may also be defined as a set of institutional arrangements by which the surplus resources (or commands over real resources) in the economy are mobilized from surplus units and transferred to deficit spenders. This type of institutional arrangements includes all condition, distribution, exchange and holding of financial assets or instruments of all kinds and the organization, as well as, the manner of operation of financial markets and institutional of all descriptions connected therewith. To be very precise, financial assets, financial markets, and financial institutions are the three main constituents of any financial system.

Financial assets are claims of securities which are divided into two categories, namely, Primary or direct securities and secondary or indirect securities. The former is financial claims against real-sector units. The examples are bills,

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bonds, equities, book debts, etc. They are created by real – sector units as ultimate borrowers for raising funds o finance their deficit spending. The secondary or indirect securities are financial claims issued by financial institutions or intermediaries against themselves to raise funds from the public. The examples are: The RBI currency, bank deposits, life insurance policies, UTI units, IDBI bonds, etc. In Indian economy, important financial assets are currency, bank deposits (current, savings and fixed), post office savings deposits, life insurance policies, provident fund contributions, government and corporate bonds, bills, hundis, corporate shares (ordinary and preference), units of the UTI, company deposits, deposits with investment companies, trusts, nidhis, chit funds and similar other organization.

Financial markets can be defined as centers or arrangements that provide facilities for buying and selling of financial claims and services. Financial markets are more or less like markets for goods and services. They have their own demand and supply, quantities and prices. The structure of financial market can be studied in various angles, viz., functional, institutional and sectoral. They can be divided into primary (or direct market; and secondary (or indirect) markets. The former is concerned with and deals with new financial claims or new securities. It is also known as new issue markets. The latter i.e., secondary markets, on the other hand deal with securities which are already issued. The financial institutions may also be called as financial intermediaries. Under this category come all banks and non-banking financial institutions. In India, the banking system comprises of the commercial banks and co-operative banks. The central or the Apex Bank of the country is he RBI. Under non-banking financial institutions, we have development banks and investment institutions, etc

REVIEW OF LITERATURE

The role of the financial system is to intermediate between lenders and borrowers, providing a menu of saving vehicles with differing risk and return characteristics, and helping investors find the financing they need, taking into account the returns and risks on the projects they wish to undertake. In carrying out their functions, financial intermediaries reduce transactions costs for savers and investors and help reduce problems of asymmetric information that are inherent in the relationship between investors and entrepreneurs. And to important and increasing and increasing extent, the development of sophisticated derivative instruments has helped improve the allocation of risk in the economy, and increase the efficiency of the saving- investment process.

For a given level of saving, more efficient financial intermediation increases the productivity of investment. It thus seems obvious that the more efficient the financial system, the more rapid the growth rate. In practice, there are two views on the importance of the financial system during development. The first view is that the financial sector does not matter very much, and that any correlation between financial development and growth is a result of growth leading development.

Robert Lucas, who in his celebrated 988 paper on development said: "I will ....be abstracting from all monetary matters, treating all exchange as thought it involved goods-for-goods. In general, I believe that the importance of financial matters is very badly over-stressed in popular and even much mire professional discussion and so am not inclined to be apologetic for going to the other extreme."

The second view is that an efficient financial system is key to development. In his classic, Lombard Street, published in 1873, Walter Bagehot argued that it was England's efficient capital markets that made the industrial revolution possible. However, the most important and thorough early contribution on financial development and economic development came from Jose Schumpeter, whose 1912 German book on the subject was published in English only in 1934, as The Theory of Economic Development.

Schumpeter contended that financial development causes economic development – that financial markets promote economic growth by funding entrepreneurs and in particular by channeling capital to the entrepreneurs with high return projects. He developed his case in vivid language:

"The banker.... Is not so much primarily a middleman in the commodity 'purchasing power' as a producer of this commodity.... He stands between those who wish to form new combinations and the possessors of productive means. He is essentially a phenomenon of development, though only when no central authority directs the social process. He makes possible the carrying out of new combinations, authorizes people, in the name of society as it were, to form them. He is the ephor [overseer] of the exchange economy."

A developed financial system is a necessary part of an expanding economy, as it mobilizes the financial resources of the economy to support investment and technological advances. In fact, the dramatic growth record of the U.S over the last 150 years as well as that witnessed in other western countries has depended on the development of a well- functioning financial system. The growth of output in any economy depends on the increase in the proportion of savings/investment to a nation's output of goods and services. The financial

system and financial institutions help in the diversion of rising current income into savings/investments. Therefore financial systems may be defined as a set of institutions, instruments and market, which foster savings, and channels them to their most efficient use. The system consists of individuals (savers), intermediaries, markets and users of savings. Economic activity and growth are greatly facilitated by; the existence of a financial system developed in terms of the efficiency of the market in mobilizing savings and allocating them among competing users.

Economists have found empirical evidence that countries with developed financial systems tend to grow faster; King and Levine (1993) find that growth is positively related to the level of financial development. Looking at the evidence from 80 countries from 1960 to 1989, they show that the relative size of the financial sector in 1960 is positively correlated with economic growth over the period. However, positive correlation may simply reflect the fact that faster growing countries in the number of financial transactions conducted. By measuring financial sector development at the beginning of the period, in 1960, King and Levine try to mitigate concerns about possible reverse causation between financial development and economic growth.

However, this evidence does not necessarily prove that financial development causes growth. The size of the financial sector in 1960 may depend on the expectation of future economic growth. Subsequent work using statistical techniques to control for the endogenous effect of economic growth on financial development as well as for country-specific factors that are not explicitly considered, and using both time series and cross-sectional data to extract more information from the data, has shown that the effect of financial development is robust. (For example, Levine, Loayza, and Beck 2000, Benhabib and Spiegel 2000).

ROLE OF FINANCIAL SYSTEM

To understand how the financial system might influence economic growth, we need to review the roles of the financial system in greater detail.

First, the financial system mobilizes savings. Since an individual saver may be unable or unwilling to completely fund a borrower, financial markets and institutions pool the savings of diverse households and make these funds available for lending. This activity reduces the transaction costs associated with external finance for both firms and households. By going directly to a financial institution, firms seeking to borrow avoid the costs of having to contact a diverse group of savers. Similarly, savers avoid the costs of

evaluating every potential borrower by placing their funds with a financial institution.

Second, the financial system allocates savings by determining which borrowers obtain loans. Since financial institutions are specialists, they can determine worthwhile investment opportunities and judge the creditworthiness of borrowers at lower cost than the average small investor.

The Third role of the financial system is to reduce risk by spreading investors' savings across many different investment opportunities. Spreading savings diversifies risk for households and reduces their exposure to the uncertainty associated with individual projects. This reduction in risk encourages savings.

The fourth role of the financial system derives from its ability to generate liquidity. Some investments with potentially high returns involve projects that require long-term commitments of capital. However, some investors may unexpectedly need access to their savings. Fortunately, when the financial system pools the investments of many households, it allocates funds to both short-and long-term projects. Thus investors obtain higher returns on their savings than they would if their investments were limited to short term projects, but they still have access to their savings in unforeseen circumstances. Further, mixing investments in this way ensures that worthwhile long-term projects are funded.

Fifth, the financial system facilitates trade by extending credit and guaranteeing payments. For example, currency, demand deposits, and credit card accounts all allow individuals to exchange goods and services without having to resort to barter. Additionally, letters of credit help firms order the inputs for current production when they experience delays in payment for past sales.

The financial system also exerts corporate control and monitors managers. Entrepreneurs' or managers' information about the operation and outcome of their projects tends to be superior to information that outside creditors and shareholders have. Insiders' attempts to exploit this informational advantage by engaging in opportunistic behavior would tend to discourage savings. For example, managers might underreport their firms' profits to lenders and shareholders in order to raise their own earnings. To offset this information advantage, banks monitor borrowers, and equity markets allow shareholders to discipline managers by voting out poor management. These roles suggest that a well-functioning financial system might permit a higher level of saving and investment and, therefore, economic growth.

The prevailing view in economics is that financial development contributes to growth in various ways. For example, financial institutions are better suited than individuals to identify potentially successful projects because these institutions are big enough to pay large fixed costs of collecting information about individual projects and to analyze this information more efficiently. In addition, once a project has started, they can better monitor its managers to ensure that savers' resources are used productively. Financial markets also can enhance growth. First, they help collect resources from many savers necessary to invest in large projects. Second, they facilitate the pooling and hedging of risk inherent in individual projects and industries. Finally, secondary financial markets also reduce securities holders' liquidity risk by allowing them to sell their securities without affecting firms' access to the funds initially invested. Thus, well-developed financial markets and institutions can generate growth by increasing the pool of funds and by reducing the risk and enhancing the productivity of fund transfers from savers to investment projects.

BANK AND ECONOMY

Joseph Schumpeter argued in 1911 that banks play a pivotal role in economic development because they choose which firms get to use society's savings. According to this view, the banking sector alters the path of economic progress by affecting the allocation of savings and not necessarily by altering the saving rate. Thus, the Schumpeterian view of finance and development highlights the impact of banks on productivity growth and technological change. Alternatively, a vast development economics literature argues that capital accumulation is the key factor underlying economic growth. According to this view, better banks influence growth primarily by raising domestic saving rates and attracting foreign capital.

According to Arestis and Demetriades, correlations between the development of the banking system and the level of economic growth become weaker when the financial system suffers from ill health. In countries that have experienced financial crises, such as Chile and Spain, the development of the banking system tends to lag behind the growth of the economy. In others, where the development of the banking system has been without problems, such as Germany or Japan, the development of the banking system stimulates growth in other sectors of the economy.

Bankers are the custodians; and distributors; of the liquid capital of the capital. This has become the life-blood of our commercial and industrial activities. The well being of the nation depends upon he prudence of the administration of the banking system.

The modern banking has to perform a three-fold function in the economic system. In the first place, it has to collect from the whole of the community the savings and unused purchasing power into what we might term a great reservoir. Secondly, it has to place these sums entrusted to it at the disposal of those who can make use of them. Thirdly, it has to provide a suitable medium of exchange to facilitate these functions. From these, we can understand that the first and foremost work of bank is accepting deposits from the public. Secondly, the system should make available these funds to the Business and investing community through granting of loans. Thirdly, the process and the procedure and the medium connected in these should be facilitating these functions easily.

According to the first function, the banker becomes the trustee of the surplus balances of the public. Herein lies the onerous duty of the banker in stimulating savings and mobilization of surpluses. According to the second function, the banker assumes the role of an entrepreneur in making investments. In the absence of organized banking system, much less capital would be available for industry. In short, the banker is an entrepreneur of entrepreneurs. The increased production, which follows the extended use of capital, means more wealth to the community. In this respect, bankers are producers of wealth in the community. Increased wealth and capital formation in the economy means, more savings that in turn, produce more wealth. In short, the banking system is the lever in the Engine of Growth.

There is no need to over-emphasize the importance of banking as part and parcel of modern industrial and commercial culture. The role of banking in promoting development and growth especially in the context of planning and breaking the vicious circle of poverty and to retrieve the economy from the trap of underdevelopment is a matter of paramount importance, particularly when our country is on the way of development.

STOCK MARKET AND ECONOMY

The stock market is an indispensable institution created in competitive economy, which has fostered the growth of Joint-stock companies. Without an efficient stock exchange, the savings of the community could not be used fully, and at times even wastefully too. We know that the savings of the community are very essential for economic development. Stock exchange provides facilities to meet the investment requirements of the public. Individuals and institutions can buy and sell securities whenever they please, very conveniently and quickly and also economically. Through the stock exchange, the sellers of stock can sell at the best possible price and buyers can buy at the prevailing market price of the securities, as it is a market place

where the transactions converge. A stock exchange provides a place to raise capital for industries. The existence of a broad and liquid exchange market is a vital factor in facilitating the issuance of new securities, which are to be listed there.

Their presence reduces the cost of underwriting and encourages both individuals and institutions to invest. A stock exchange directs the flow of savings between different types of competitive investment. It helps in channellising the savings of people to meet the investment needs of the entrepreneurs and the buoyancy created, sets forth activity in the capital market. Thus, the capital is not only attracted but, is directed towards profitable channels. This task is accomplished by watching the price movements. Unlike in conventional auctions where only buyers compete, in a stock exchange, even sellers compete for buyers. The prices in a stock exchange reflect the basic law of supply and demand. A rise in price of a particular security indicates future prospects and affords an incentive to investor. Stock exchanges reflect the general conditions of the business atmosphere.

The significance of stock exchange lies in the provision of a broad, continuous liquid market. By continuous market, we mean a market where only listed security may be bought and sold at any time during business hours at comparatively small variations from the current price. Evaluation of securities at their true worth is another significant factor. A stock exchange provides machinery where price is evolved and registered. This is a service of profound value to the investors, companies and lenders. To the tax collecting authorities too, stock exchanges provide a reliable means for estimating the value of securities for proper assessment. Stock exchange also enable the companies to raise additional capital because, the securities listed in the stock exchanges carry high degree of collateral value.

RESEARCH METHODOLOGY

The primary purpose or objectives is to study the interrelationship between financial system and economic growth in India. The methodology adopted for the study with an intension to clarify the basic ideas. This study primarily aimed at the interrelationship between the financial system and the economic growth in India. Stock market and Bank are the two important components of the financial system. Their growth and development expected to have impact on the economy. In many earlier studies both in India and in abroad indicates the positive role played by the financial system on the economy. In this connection, it was thought fit to make an attempt to see whether there is any such relationship between financial system and economy. If so, whether both

components of financial system influence the economy or only one of the components. Different types of data have been employed by researchers in the past in the area of finance and economy, cross country data, time series data, etc. In this chapter the nature of data employed interval of data, period of study, objectives of study have been discussed.

PERIOD OF THE STUDY

The study covers the period from January 1993 to Dec 2003, and the data are collected for the above-mentioned period. In the post-liberalized period, this period was determined basically to have uniformity in data collected for all variables.

SOURCES OF DATA

The time series data on stock market turnover, Market Capitalization, have been compiled from key statistics published by the Bombay stock exchange on a monthly and Quarterly basis for the period 1993 to 2003. Their web site was an additional source whenever the required information has been missing. Details on Bank deposits and Bank credit to private enterprises and other economic variables are collected from the handbook of statistics on Indian Economy published by the RBI. More data and information are supplemented from the websites of SEBI, CMIE, Indiainfoonline, BSE, and NSE. Since, GDP is not available on a monthly basis quarterly data were collected for GDP and IIP is taken as proxy of Economy when analysis is done on monthly basis.

Table No 1
Correlations between dependent (Y) variables

	Bankcre	Bankdep	MCRbse	TORbse	TVTbse
Bankcre	1.000				
Bankdep	0.998	1.000			
MCRbse	0.265	0.264	1.000		
TORbse	0.448	0.458	0.319	1.000	
TVTbse	0.427	0.434	0.518	0.967	1.000

Table No 2
Correlations between independent (X) variables

	M3	WPI	IIP
M3	1.000		
WPI	0.967	1.000	
IIP	0.942	0.969	1.000

Table No 3
Correlations between independent and dependent variables

	Bankcre	Bankdep	MCRbse	TORbse	TVTbse
M3	0.998	1.000	0.271	0.467	0.443
WPI	0.960	0.962	0.334	0.524	0.503
IIP	0.939	0.937	0.316	0.539	0.517

Table No 4
Estimated from X-set y intercorrelations (R- square on diagonal)

	Bankcre	Bankdep	MCRbse	TORbse	TVTbse
Bankcre	0.997				
Bankdep	0.998	1.000			
MCRbse	0.264	0.266	0.152		
TORbse	0.462	0.461	0.205	0.318	
TVTbse	0.438	0.437	0.200	0.308	0.299

Table No 5
Significance tests for prediction of each basic Y variable

Variable	F-Statistic	Probability
Bankcre	14534.483	0.000
Bankdep	149307.338	0.000
MCRbse	7.663	0.000
TORbse	19.925	0.000
TVTbse	18.221	0.000

Table No 6
Betas predicting basic y (col) from basic x (row) variables

	Bankcre	Bankdep	MCRbse	TORbse	TVTbse
M3	1.074 (57.117) [0.000]	1.070 (182.151) [0.000]	-0.788 (-2.463) [0.015]	-0.654 (-2.280) [0.024]	-0.698 (-2.400) [0.018]
WPI	-0.138 (-5.407) [0.000]	-0.061 (-7.709) [0.000]	1.144 (2.634) [0.009]	0.607 (1.560) [0.121]	0.640 (1.620) [0.108]
IIP	0.061 (3.160) [0.002]	-0.012 (-1.912) [0.058]	-0.050 (-0.151) [0.880]	0.567 (1.917) [0.057]	0.555 (1.852) [0.066]

Canonical correlations

	1	2	3
	1.000	0.510	0.382

Stewart-Love canonical redundancy Index = 0.553

Table No 7
Barlett test of residual correlations

	Chi-square statistics	df	Probability
Correlation 1 through 3	1108.182	15	0.000
Correlation 2 through 3	58.083	8	0.000
Correlation 3 through 3	19.948	3	0.000

Table No 8
Canonical coefficients and loadings for dependent (Y) set

	1	2	3
Bankcre	-0.080 (-0.999)	-3.759 (0.003)	14.982 (0.043)
Bankdep	-0.917 (-1.000)	4.423 (0.005)	-14.996 (-0.005)
MCRbse	-0.001 (-0.266)	-1.570 (-0.541)	-0.899 (-0.185)
TORbse	-0.005 (-0.462)	-5.082 (-0.617)	-1.649 (0.201)
TVTbse	-0.001 (-0.438)	4.785 (-0.625)	2.365 (0.191)
Canonical redundancies	0.495	0.055	0.003

Table No 9
Canonical coefficients and loadings for independent (X) set

	1	2	3
M3	1.062 (1.000)	3.756 (-0.016)	0.474 (-0.003)
WPI	-0.062 (0.963)	-3.086 (-0.265)	-4.354 (-0.055)
IIP	-0.002 (0.938)	-0.837 (-0.289)	3.963 (0.192)
Canonical redundancies	0.935	0.013	0.002

ANALYSIS OF DATA

A canonical correlation is the correlation of two canonical (latent) variables, one representing a set of independent variables, the other a set of dependent variables. Each set may be considered a latent variable based on measured indicator variables in its set. The canonical correlation is optimized such that the linear correlation between the two latent variables is maximized. Whereas multiple regression is used for many-to-one relationships, canonical correlation is used for many-to-many relationships. There may be more than one such linear correlation relating the two sets of variables, with each such correlation representing a different dimension by which the independent set

of variables is related to the dependent set. The purpose of canonical correlation is to explain the relation of the two sets of variables, not to model the individual variables.

Canonical correlation is a member of the multiple general linear hypothesis (MLGH) family and shares many of the assumptions of multiple regression such as linearity of relationships, homoscedasticity (same level of relationship for the full range of the data), interval or near-interval data, untruncated variables, proper specification of the model, lack of high multicollinearity, and multivariate normality for purposes of hypothesis testing.

The first canonical correlation is always the one which explains most of the relationship. The canonical correlations are interpreted the same as Pearson's: their square is the percent of variance in one set of variables explained by the other set along the dimension represented by the given canonical correlation (usually the first). Another way to put it is to say that Rc-squared is the percent of shared variance along this dimension. As an arbitrary rule of thumb, some researchers state that a dimension will be of interest if its canonical correlation is .30 or higher, corresponding to about 10% of variance explained.

Canonical coefficient, also called the canonical function coefficient *or the canonical* weight: The canonical coefficients are the weights in the linear equation of variables which creates the canonical variables. As such they are analogous to beta weights in regression analysis. There will be one canonical coefficient for each original variable in each of the two sets of variables, for each canonical correlation. Thus for the dependent set, if there are five variables and there are three canonical correlations (functions), there will be 15 canonical coefficients in three sets of five coefficients.

The redundancy coefficient d, also called R_d, is the product of the mean squared structure coefficient (which is the adequacy coefficient) for a given canonical variable times the squared canonical correlation coefficient associated with that canonical variable. Redundancy measures how much of the variance of the original variables of one set may be predicted from a (usually the first) canonical variable from the other set. High redundancy means high ability to predict.

Tables from 1 to 4 reveals that the data used in the analysis are of significant and important one; and its results are shown through table number 5 with high significance. F value and probability are of with positive and significant one for the set used in the analysis. Beta, t- values and significances are presented in table number 6. It is found that the Economy represented by IIP is having a positive relationship with bank credit and turnover of the stock

market. In other words, liquidity of the stock market and the bank credit made available to the private enterprises influences the economy positively and significantly. Whereas the same economy is influenced by the bank deposits negatively and significantly. Size of the stock market does not influence the economy as its has very insignificant influence.

Canonical correlations listed in the table tells us the perfect correlation between two sets of data from economy and from financial system. Which means that financial system and the economy are going in tandem. Even taking the last correlation listed indicates the relationship with the limit expected namely 0.3. Redundancy explained in the tables 8 and 9 indicates that first correlation explains the best of the variations between the dependent and independent variables.

CONCLUSION

Therefore it is concluded that financial system and economic growth in India has a perfect relationship. Only concern is to be noted is that financial system consists of only bank credit given by the banks to private enterprises and the liquidity of the stock market. Importance should be given to the exclusion of size of the stock market and the bank deposits mobilized. This study also explains the basic relationship by taking few of the variables from both financial system and economy. But further research is required to be done by considering many more variables, which are of importance to the economy and financial system. Like other studies made through different statistical techniques, this canonical correlation reveals and confirms that the relationship between financial system and economic growth exists and care should be taken to develop the financial system in India.

REFERENCES

- *Robert A. Eisenbeis, Bank deposits and credit as source of systemic risk, Article provided by Federal Reserve Bank of Atlanta in its Journal Economic Review, pp: 4-19, 1997.*
- *Robert G.King, Rose Levine, Financial Indicators and growth in a cross section of countries, world Bank paper, 1992.*
- *Ross Levine, Bank based and market based financial systems cross-country comparison, paper provided by world Bank in its series working papers, Domestic finance, saving, financial systems, stock markets, with no.2143, July 1999.*
- *Ross Levine, Financial development and economic growth, World Bank, Washington, 1996, PRWP 1678.*

- *Ross Levine, Financial structures and economic development, World Bank, Washington, 1992 PEWP 849.*
- *Ross Levine, Sara Zervos, Stock Market Development and Long-Run Growth, The World Bank, Policy Research Department, Finance and Private Sector Development Division, march 1996.*
- *Shankha Chakraborty, Tridip Ray, The development and structure of financial system, Paper provided by University of Oregon Economics department in its Series University of Oregon economics department working Paper with no.2003-2. 1st Jan 2003.*
- *Shankha Chakraborty, Tridip Roy, Bank-based versus Market-based financial systems: A growth – theoretic Analysis, paper provided by university of Oregon economic department working papers with no-2003-6, 1st Feb, 2003.*
- *Stanley Fischer, The Importance of Financial Markets in Economic Growth, citigroup, august 21, 2003.*
- *Stein,Jeremy c., Efficient capital markets, Inefficient firms; A model of myopic corporate Behaviour, Article provided by MIT press in its journal of Quarterly Journal of economics, volume-104, pp: 655-69, November 1989.*
- *Sussman, Oren and zeria, joseph, Banking and Development, Paper provided by CEPR discussion papers in its series, CEPR discussion papers with no: 1127, February 1995.*
- *Thorsten Beck, Ross Levine, stock markets, Banks, & growth: Correlation or Causality, paper provided by world Bank in its series working papers, Domestic finance, saving, financial systems, stock markets, with no.2670, sep 2001.*
- *Thorsten Beck, Ross Levine, stock markets, banks, and growth: panel evidence, paper provided by NBER Inc, in its series NBER working papers with no.9082, July 2002.*
- *Tuuli Kolvu, Do efficient banking sectors accelerate economic growth in transition countries? , Paper provided by economics working paper archive as WUSTL, in its series Macroeconomics with number: 0212013, 31st DEC 2002.*
- *Vaterlano F. Garcia, Lin Liu, Article provided by universidad del CEMA in its Journal of Applied economics, Volume-II, pp: 29-59, May 1999.*
- *Wang, Jiang, A model of competitive stock trading volume, Article provided by university of Chicago press in its Journal of Political economy, volume 102, pp: 127-68, February,1994.*

- *William F. Duisenberg, The role of financial markets for economic growth, Speech delivered by the President of the European Central Bank, at the Economics Conference " The single financial market: Two years into EMU" organized by the oesterreichische national bank in Vienna on 31-may-2001.*
- *Zhen Li, Financial Development and Economic Growth, Princeton University, August 2002.*
- *Zsolt Becsi, Ping Wang, Financial development and growth, Article provided by Federal Reserve Bank of Atlanta in its, Journal economic review, pp: 46-62, 1997.*