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IMPACT OF FINANCIAL DEEPENING ON ECONOMIC GROWTH IN INDIAN PERSPECTIVE: ARDL BOUND TESTING APPROACH TO COINTEGRATION

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ABSTRACT

The present work is an attempt to investigate into the causal impact of financial deepening on economic growth in case of India. For analyzing the long term equilibrium relationship between the desired variables, we have employed Autoregressive Distributed Lag (ARDL) Bound testing approach. ARDL being a new approach is an improvement over the other traditional techniques of cointegration. Further, using the Granger Error Correction Model (ECM) technique we have tried to estimate the causal impact in the short run also. The findings suggest that there exist an equilibrium relationship in long run between financial deepening and economic development. Results suggested that financial deepening causes economic growth in the long run and also in the short run. Therefore, it is concluded that for enhancing the economic growth the government has to take effort to improve the financial deepening. Special efforts should be put to provide easy credit to private sector, stock market development and also to foster foreign trade.

Contribution/ Originality: This study uses Auto Regressive Distributive Lag (ARDL) bound testing approach of estimating cointegration among variables. This technique is rather new and improved over the traditional co integration techniques. Moreover we have used the most recent dataset for finding the impact of financial deepening on the economic growth in Indian context.

1. INTRODUCTION

The finance led economic growth is one of the most discussed issues in economics. Usually it is argued that for the development of economy, the financial sector must be well developed. The

financial sector of a country facilitates mobilization of savings thereby turning it into the capital required for economic growth. Augmented financial sector increases the access to the funds at the minimum cost. This spurs the level of economic activities which in turn increases economic development. There is a plethora of research work establishing a positive link between financial deepening and economic growth. Research argues that there is a bidirectional causality running form the financial deepening and economic growth. While financial deepening supports economic growth, Economic growth also forms ground for financial development. This is named as a supply leading (financial development →Economic Growth) and Demand following (financial development ←Economic Growth) process Patrick (1966); McKinnon (1988); Luintel and Khan (1999) and Kirkpatrick (2000).

Financial sector is nervous system of the economy. It is a system that performance the responsibility of coordination between surplus spending units and deficit spending units. Like many other countries, the liberalization process in India has made it necessary to strengthen the financial sector. Indian Financial Sector is comprised of financial Institutions, financial markets, Financial Instruments. This formal structure of Indian financial system has many components, namely, banking institutions, non banking financial institutions, money market, capital market, various short term, medium term and long term securities, etc. It also includes financial services like lease financing, factoring, Merchant Banking, Credit ratings etc. The Financial system in India was in stagnancy until 1990 as the only functioning done was the mobilization of savings to the sectors requiring investments. The Banking sector has then been improvised by the nationalization of larger banks in the year 1969 and 1980. The policy makers have tried to rectify the problems were prevailing in Indian financial sector like uncompetitiveness, insufficient capital, low productivity, lack of application of information technology, high intermediation cost, low asset quality, poor risk management, poor quality of service, low profitability etc.After 1990, for strengthening the financial sector a number of steps have been initiated. The aim was to foster economic performance using improvised financial infrastructure. RBI has introduced number of steps for setting regulatory frameworks, effective supervisions, institutional and technological infrastructure. The financial sector reforms include liberalization of interest rate controls, easing the RBI's regulations and government norms on larger loans and to increase investment in government securities. It also include banking supervision and setting norms related to capital adequacy requirement of banks, liberalization of licensing process for private and foreign banks etc. Since the financial reforms of 1991, there have been significant favorable changes in India's highly regulated financial Sector. Researchers have concluded that the financial sector reforms have had a moderately positive impact on reducing the concentration of the Financial Sector (at the lower end) and improving performance (Gupta and Verma, 2012). In this context the present work is an attempt to explore and reconfirm the causality relationship between financial deepening and economic growth in the context of Indian economy using the ARDL approach of cointegration which is rather a new technique used to established long term relationship as compared to Engle Granger approach or the Johansen Jesulious Cointegration technique. The

paper is organized as follows: Section II includes review of literature. Section III discusses methodology, empirical analysis and findings and section IV includes the conclusion.

2. REVIEW OF LITERATURE

The initial evidences of relation between financial development and economic growth is found in the extensive work of Goldsmith (1969) where he concluded that the financial development has a positive and causal impact on the economic growth. In the recent literature (Levine, 1997) has described the financial system facilitates the trading, hedging, diversifying, and pooling of risk, allocates resources, monitors managers and exerts corporate control, mobililizes savings, and facilitates the exchange of goods and services thereby supporting economic growth. Darrat and Salah (2005) in their attempt to assess the impact of financial sector development on the severity of business cycles, concluded that financial development is positively related with economic growth in long run. However they also could not find any short term relation of this type. Similarly Wong and Zhou (2011) in their cross countries analysis found that stock market development is a key driver for the economic growth. Khalil (2014) has remarked that the measures of financial deepening has positive impact on economic growth in context of developing countries but has negative impact in context on developed countries. Pradhan (2009) in his study conducted for India, found bidirectional causality between financial structure and economic growth. He suggested that financial development should be considered as the policy variable to enhance economic growth and also the economic growth could be considered as the policy variable to generate financial development in the economy. In their study for 10 sub Saharan countries Anthony and Tajudeen (2010) show evidences of unidirectional causality form financial deepening to economic for some countries and also the other way round for some other countries. However there were countries where they found bidirectional causality between financial deepening and economic growth. Onayemi Sherifat (2013) in their attempt to find the relation between the output growth, economic openness and financial development, concluded that financial deepening and trade openness does not cause changes in output growth. But under some structural era the economic growth granger cause financial deepening and trade openness. Azra (2012) in his research work about estimating the relationship between financial deepening and poverty alleviation have found positive impact of money supply and bank credit to private sector on poverty alleviation. In their research on six countries, Arestis *et al.* (2005) found that the financial structure as denoted by STR, (either market based variety (High STR) or Bank based type (low STR)) has significantly denoted causes the economic growth. Levine and Zervos (1998) based on their research on 47 countries over a time period of 1976-1993, concluded that banking development and stock market development (in terms of liquidity and capitalization) are contributory to economic growth. Singh (1997) has a different view that the stock market cannot foster the economic growth and industrialization. This is due to inefficient allocation of investment led by volatility and arbitrariness of the stock market pricing process. The other reason for this being the negative impact of stock market growth on the banking system in developing company. Calderon and Liu (2003) using ratio of broad money to GDP ratio and the

ratio of credit provided to private sector as a measure of financial development, found that financial development causes economic growth.

3. METHODOLOGY, ANALYSIS AND FINDINGS

3.1. Data

For assessing the impact of financial deepening on the economic development, we have employed five variables. GDP per capita is proxy for economic development. Remaining four variables are the representation of financial deepening in the economy. The description of all the variables is as follows-

LY= GDP per capita.

LM= ratio of broad money (M2) to GDP.

LMC= is the indicator of stock market development. This is measured as the ratio of stock market capitalisation to GDP.

LCR= is the ratio of credit to private sector to GDP. Representing the banking sector development.

LT= ratio of Total trade (Import plus export) to GDP representing openness of the economy.

All the variables are in the natural logarithmic form. We have used the time series data for the period starting from 1990-91 to 2013-14. The data source is the hand book of statistics on Indian economy published by RBI, the central bank of India. As far as the empirical investigation of the data is concern, keeping the prime objective into consideration we have tried to develop the following model.

Economic Growth = f (Financial Deepening)…….....(1)

The econometric form of the above model is as follows-

$$LY_t = \alpha + \beta_1 LM_t + \beta_2 LMC_t + \beta_3 LCR_t + \beta_4 LT_t + \varepsilon t \text{……...……..…...(2)}$$

Where all the variables are same as described above and are in log form. α is intercept and $\beta 1$-$\beta 4$ are coefficients of explanatory variables. At the first place the descriptive and correlation matrix among the variables is determined. The results are presented in the following table –

Table-1. Descriptive Statistics

	LY	LMC	LM	LCR	LT
Mean	6.467779	3.785775	4.045926	3.474216	3.410619
Median	6.40127	3.555942	4.079121	3.386652	3.321037
Maximum	7.060473	4.934812	4.353049	3.947871	4.002455
Minimum	5.98978	1.907926	3.724651	3.096609	2.723859
Std. Dev.	0.350086	0.849819	0.233609	0.323985	0.421132
Skewness	0.266303	-0.12551	-0.00121	0.291073	0.062518
Kurtosis	1.792501	2.134232	1.417706	1.401886	1.575918
Jarque-Bera	1.741723	0.812569	2.503659	2.892863	2.043643
Probability	0.418591	0.666121	0.285981	0.235409	0.359939
Sum	155.2267	90.8586	97.10222	83.38119	81.85486
Sum Sq. Dev.	2.818882	16.61043	1.255178	2.414228	4.079097

Table-2. Correlation matrix

	LY	LMC	LM	LCR	LT
LY	1				
LMC	0.915824	1			
LM	0.969634	0.886493	1		
LCR	0.962344	0.882601	0.970764	1	
LT	0.979662	0.933395	0.971993	0.963553	1

3.2. Unit Root Testing

We have first tested the stationarity issue in all the variables. The stationarity issue is of paramount importance in the econometrics. The series with the unit root can lead to spurious regression, which will show a high R^2, even when there is no meaningful relationship among the variables. It is therefore necessary to test the stationarity of each variable before proceeding to the further analysis and finding the order of integration. A stationary series would have a mean and variance which are not time variant. We have employed the Dickey Fuller Generalized Least Square test (DFGLS) and the Phillips Perron (PP) unit root testing. The DF-GLS approach requires estimation of the following regression form, on detrended data (Stock and Watson, 2011)-

$$\Delta y_t = \boldsymbol{\alpha} + \boldsymbol{\beta} t + \boldsymbol{\gamma} y_{t-1} + \boldsymbol{\delta}_1 \Delta y_{t-1} + \ldots + \boldsymbol{\delta}_{p-1} \Delta y_{t-p+1} + \boldsymbol{\varepsilon}_t \quad \ldots(3)$$

Where Δ is the differenced operator, p is the lag term which can be selected by AIC or SIC criteria and the y is the variable of interest. Similarly the PP test estimate the following form-

$$X_t = \alpha + \sum_{t-1}^{T} X_t - 1 + \varepsilon_t \quad \ldots(4)$$

Here the null hypothesis is that the series contains unit root hence it is non stationary while the alternative is that series does not contain unit root so it is not stationary. If the test statistics is more than the critical values we can reject the null hypothesis.

Table-3. Unit root testing results

	Dicky Fuller Generalized Least Square (DF-GLS)Test		**Phillips Perron (PP) Test**	
	Level			
Variables	Constant Without Trend	Constant With Trend	Constant Without Trend	Constant With Trend
LY	-0.918370	-1.981788	1.788370	-2.594054
LM	-0.178597	-2.209948	-0.527805	-1.712426
LMC	-1.255220	-2.576892	-2.073565	-4.063422 *,**
LCR	-0.898425	-2.283406	0.281524	-2.420112
LT	-0.086503	-2.368634	-0.977352	-2.228376
	First Difference			
LY	-2.935*,**,***	-3.927*,**,***	-4.120*,**,***	-3.965*,**,***
LM	-3.353*,**,***	-3.360**,***	-3.27 **,***	-3.195939
LMC	-1.368	-7.485*,**,***	-9.549*,**,***	-9.212*,**,***
LCR	-1.438	-1.661	-4.650*,**,***	-4.727*,**,***
LT	-6.113*,**,***	-6.111*,**,***	-5.968*,**,***	-5.875*,**,***

Source: Own Estimation under MacKinnon (1996) critical values, *,**,*** represents significance at 1,5 & 10 % level.

The above estimate shows that all our variables except the LMC, are non stationary at level but attain stationarity after first difference. While is stationary at the levels. Thus one variable is integrated of order 1 and others are integrated of order 2. This mix order of integration of the variables calls for the usage of ARDL approach of cointegration. The results are verified by both the DGLSF and PP tests. Even Though ARDL approach of cointegration testing does not necessitates unit root checking as it can incorporate both I(0) and I(1) variables together , but it requires that no variable should be integrated of order 2 or I(2). Hence for testing I(2) variable, also the unit root testing is done and the results confirm that no variable is I(2).

3.3.Cointegration Testing Using ARDL Approach

Further, in order to investigate whether or not the variable are cointegrated or they posses equilibrium relationship in the long run, we have employed the recently developed ARDL (Auto Regressive Distributed Lag) bound testing technique developed by Pesaran and Shin (1999) and Pesaran *et al.* (2001). The optimum lag length for this purpose is obtained by AIC criterion. The ARDL model technique has various advantages over traditional techniques like it is more flexible, it can be used with I(0) or I(I) variables and it can be used comfortably with small samples and it provides us with unbiased estimation of long run relationship and long run parameters (Harris and Sollis, 2003).

The ARDL approach of co integration is applied as a vector autoregressive (VAR) model of order p. With the variables in this study, this takes the following form-

$$D(L(Y_t)) = \alpha_{0t} + \beta_{1t} L(Y_{t-1}) + \beta_{2t} L(M_{t-1}) + \beta_{3t} L(MC_{t-1}) + \beta_{4t} L(CR_{t-1}) + \beta_{5t} L(T_{t-1}) + \sum_{i=1}^{p} \alpha_{1i} D(L(Y_{t-i}))$$

$$+ \sum_{i=1}^{q} \alpha_{2i} D(L(M_{t-i})) + \sum_{i=1}^{q} \alpha_{3i} D(L(MC_{t-i})) + \sum_{i=1}^{q} \alpha_{4i} D(L(CR_{t-i})) + \sum_{i=1}^{q} \alpha_{5i} D(L(T_{t-i})) +$$

$$\varepsilon_{1t} \quad \text{.....(5)}$$

Where Y,M,MC,CR and T are variables of study, L is logarithm operator, D is first difference and ε is error term. Under the above equation the null hypothesis is that no cointegration exist whereas alternative hypothesis is that cointegration exist. The null hypothesis is tested by conducting F-test for the joint significance of the coefficients of the lagged levels of the variables. Thus

H0= $\beta_{1i} = \beta_{2i} = \beta_{3i} = \beta_{4i} = \beta_{5i} = 0$

H1 = $\beta_{1i} \neq \beta_{2i} \neq \beta_{3i} \neq \beta_{4i} \neq \beta_{5i} \neq 0$

For i= 1,2 ,3 ,4 ,5.

Table-4. Result of ARDL bound testing

Variables	F- Statistics		Result	
F(LY/LM LMC LCR LT)	12.7049*,**,***		Cointegration	
	Pesaran		Narayan	
				Continue
Critical Values	Lower Bound	Upper Bound	Lower Bound	UpperBound
1%	2.45	3.52	4.768	6.67
5%	2.86	4.01	3.354	4.774
10%	3.74	5.06	2.752	3.994

Note: (*,**,***significant at 1%,5%,10% significance level)

The ARDL estimates of F statistics which are given in the table 4. This value is then compared with the upper and lower bound critical values as given by presaran and narayan to find out the cointegration. We used the tables provided by both pesaran and naranyan. The critical values developed by narayan are more suitable for the small samples. The critical values are given under I(1) upper bound and I(0) lower bound, the former, assuming that all the variables are integrated of order 1 and the later assuming that all the variables are integrated of order 0. If the obtained F statistics falls below the I(0) values then conclusion is that there is no cointegration and if the F statistics is more than I(1) then it is concluded that there is a cointegration. However if the f statistics falls in between these two values then the results are inconclusive and we have to rely on any other technique of cointegration. In our case the result of the test shows that the F statistics is more than upper bound at all the significance levels. Thus it can be concluded that the variables are cointegrated and all bears a long term equilibrium relationship.

3.4. Granger Long Run and Short Run Causality

We estimate the long run equilibrium relationship between the variables using the ARDL(1,1,1,1,1) long run model for l(Y_t) as given by the following equation-

$$L(Y_t) = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} L(Y_{t-i}) + \sum_{i=1}^{q1} \alpha_{2i} L(M_{t-i}) + \sum_{i=1}^{q2} \alpha_{3i} L(MC_{t-i}) + \sum_{i=1}^{q3} \alpha_{4i} L(CR_{t-i}) + \sum_{i=1}^{q4} \alpha_{5i} L(T_{t-i}) + \varepsilon_t \quad (6)$$

The result on normalizing on Y are given in the following table-

Table-5. Estimated Long Run Coefficients using ARDL approach

Variables	Coefficient	T statistics	Probability
C	1.8144	2.6203	0.021
LM	1.7115	3.3792	0.005
LMC	0.4554	3.0142	0.010
LCR	-0.88521	-2.7973	0.015
LT	-0.17565	-0.48853	0.633

Result shows that the coefficients are significant for the variables M (M2 to GDP ratio), MC (Market capitalization to GDP ratio) and CR (Credit given to private sector to GDP ratio) but

insignificant for T (Total Trade to GDP ratio). This indicates that while the variables, money supply and stock market capitalization have a positive and significant impact on the Economic growth in the long run. The variable Credit to private sector by banks has significant impact on economic growth. However the trade does not give any significant impact on economic growth in the long run.

Short run parameters are estimated using the error correction mechanism (ECM). Under ECM technique, the long run causality is depicted by the negative and significant value of the error correction term (ECT) and the short run causality is shown by the significant value of other regressor variables. The following OLS equation is tested for the short run causality in ARDL(1,1,1,1,1) framework-

$$D(L(Y_t)) = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} D(L(Y_{t-i})) + \sum_{i=1}^{q} \alpha_{2i} D(L(M_{t-i})) + \sum_{i=1}^{q} \alpha_{3i} D(L(MC_{t-i})) + \sum_{i=1}^{q} \alpha_{4i} D(L(CR_{t-i})) + \sum_{i=1}^{q} \alpha_{5i} D(L(T_{t-i})) + \alpha ECT_{t-1} + \varepsilon_{1t} \quad \text{.......(7)}$$

Where a1i, a2i, a3i, a4i and a5i denote the short-run dynamic coefficients of the model's convergence to equilibrium and the speed of adjustment is denoted by α.

Table-6. Estimates from the Error Correction Mechanism

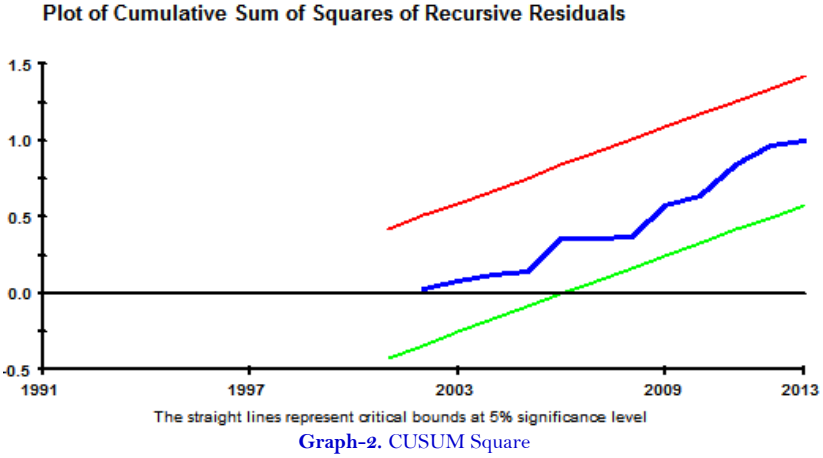
Variables	Coefficient	T statistics	Probability
DLM	-0.16652	-0.17015	0.107
DLMC	0.41998	4.38	0.000
DLCR	0.62257	0.8686	0.397
DLT	-0.12831	-2.815	0.011
Ecm (-1)	-0.15399	-4.4882	0.000
R^2	0.914		
$\bar{R}$-square	0.855		
F Statistics	27.86		0.000
DW satistics	2.45		

The results from the above equation (7) are shown by the table 7. It is clear that short-run dynamics is in conjunction with the long-run relationships as shown by the value and sign of lagged error correction term (ECT). As required ECT has a negative sign and it is significant at 1% level. This represents that there exist long term relationship between the dependent variables and the regressors implying that Money supply, Market Capitalization, Credit to private sector and the trade cause economic growth in the long run. We can see that this is also supporting the result of ARDL bound testing. However the value of ECT is -0.15 which shows the weak speed of adjustment to equilibrium. Thus only the 15% of the disturbance/disequilibrium converge back to the long term equilibrium. From the same table it is concluded that variables LM (Money Supply) and LCR (credit to private sector by banks) are not significant, it means that these variables don't

have any impact on economic growth in the short run. But the variables LMC (Stock Market capitalization) has a positive and significant impact while the LT (Total trade) has a significant but negative impact on economic Growth in short run. As far as the diagnostic checks are concerned, this model is good fit and it passes all the diagnostic tests. The R square value is .91467 (R^- square value is .85559) representing that the almost 92 variations in the dependent variables are represented by the model and rest by the error term. Further the DW statistics is 2.4589 confirms that the model is not spurious. It passes the test regarding serial correlation (Durbin Watson test and Breusch-Godfrey test), normality (jarque bera test) and heteroscedasticity. The stability of the parameters is tested through the CUSUM (cumulative sum of recursive residuals) and the CUSUMSQ (cumulative sum of recursive residuals of square). These tests are suggested by Pesaran and Pesaran (1997) for measuring the parameter stability. The following graph shows the CUSUM and the CUSUM square test.

Table-7. Results of diagnostic tests

	χ^2	Probability
Breusch-Godfrey Serial Correlation test	0.808125	0.3864
Heteroskedasticity test	1.5468	0.214
Jarque-Bera test	1.38	0.49



Graph-2. CUSUM Square

Graphs show that the plot of CUSUM stays within the critical bound at 5% significance level. This represents that the model is stable.

Table-8. Block Exogeneity Wald Tests

	LY	LM	LMC	LCR	LT	Direction of Causality
LY		8.42*,**,***	1.59	5.16**,***	1.00	LM→LY; LCR→LY
LM	0.376		0.554	1.38	1.19	------
LMC	1.14	0.069		2.23	7.07*,**,***	LT→LMC
LCR	1.76	4.57**,***	3.83***		0.092	LM→LCR; LMC→LCR
LT	2.6	4.96**,***	7.14*,**,***	0.027		LM→LT; LMC→LT,

Note: *, **and*** denote statistical significance at the 1%, 5% and 10% levels respectively

The above table shows the short run granger causality between the variables. There is a unidirectional causality from money supply and economic growth and credit to private sector to economic growth. But there is no causality form economic growth to any of the variables in the short run. Similarly bidirectional causality exists between total trade and market capitalization. Unidirectional causality also exists between money supply and credit to private sector and Market capitalization to credit to private sector. It is also apparent that money supply causes the total trade in the short run. The result seems to be consistent with that of the previous studies.

4. CONCLUSION AND IMPLICATIONS

With the aim of finding the contribution of financial deepening on economic growth for Indian economy, we have tried to establish a short run and long run causality between financial deepening and economic growth in India for a period of 1990-91 to 2013-14.This has been a period of economic and financial reforms in India.

We have gathered the data and initially we have estimated the unit roots in the variables and found that all the variables have unit root at their levels but after first difference they become stationary. That means they all are integrated of first Order (I(1)). Afterwards we have employed Auto Regressive Distributed Lag, bound testing approach for finding the cointegration among the variables and the results indicates that economic growth and financial deepening is cointegrated that means the economic growth and financial deepening have long run equilibrium relationship. The results regarding long run coefficient show that all the aspects of financial deepening (money supply, market capitalization, credit to private sector and total trade) cause economic growth in the long run. In the short run economic growth is caused by the money supply and credit to the private sector. Though there is no short run causality from economic growth to any of the variables. Trade openness and market capitalization cause each other. Money supply and Market Capitalization cause the credit to private sector and money supply and market capitalization both cause Trade openness.

The result confirms at least unidirectional causality (From Financial deepening to economic growth) among the variables. Conclusively it can be said that the promotion of financial sector and increasing the financial deepening surely adds on to the financial development. Hence the government should employ all the measures which can foster development of the financial sector. This would increase the economic growth in the long run in the short run as well.

These measures can include increasing growth of banking sector, relaxing the norms and making the process of credit disbursement to the private sector easy, launching more financial product, increasing the financial institutions not only in numbers but also making the services more diverse. Financial integration should also be promoted. Also the development of the stock exchanges plays a vital role for the promotion of economic growth. Thus for increasing the market capitalization, stock markets should be made more reliable to the investor. The interest of the investor should be protected. The growth of trade is also important to the economic growth hence measure should be taken to foster the trade volume.

REFERENCES

Anthony, E.N. and R.G. Tajudeen, 2010. Financial sector development and economic growth: The experience of 10 Sub-Saharan African countries revisited. The Review of Finance and Banking, 2(1): 17–28.

Arestis, Luintel and Luintel, 2005. Financial development and economic growth: The role of stock markets. Journal of Money, Credit, & Banking, 33(1): 16-41.

Azra, 2012. Financial development and poverty alleviation: Time series evidence form Pakistan. World Applied Science Journal, 18(11): 1576-1581.

Calderon, C. and L. Liu, 2003. The direction of causality between financial development and economic growth. Journal of Development Economics, 72(1): 321–334.

Darrat, A. and A. Salah, 2005. Assessing the role of financial deepening in business cycles: The experience of the United Arab Emirates. Applied Financial Economics, 15(7): 447-453.

Goldsmith, R.W., 1969. Financial structure and development. New Haven, Conn: Yale University Press.

Gupta, S.K. and S. Verma, 2012. Financial sector reforms in India and its impact. International Journal of Research in Finance and Marketing, 2(7): 49-63.

Harris, R. and R. Sollis, 2003. Applied time series modelling and forecasting. West Sussex: Wiley.

Khalil, M., 2014. Financial development and economic growth: A dynamic panel data analysis. International Journal of Econometrics and Financial Management, 2(2): 48-58.

Kirkpatrick, 2000. Financial development, economic growth and poverty reduction. Pakistan Development Review, 3(4): 363-388.

Levine and Zervos, 1998. Stock markets, banks and economic growth. American Economic Review, 88(3): 537-557.

Levine, R., 1997. Financial development and economic growth: Views and Agenda. Journal of Economic Literature, 35(2): 688-726.

Luintel, K.B. and M. Khan, 1999. A quantitative reassessment of the finance—growth nexus: Evidence from a multivariate VAR. Journal of Development Economics, 60(2): 381-405.

MacKinnon, J.G., 1996. Numerical distribution functions for unit root and cointegration tests. Journal of Applied Econometrics, 11(6): 601–618.

McKinnon, R.I., 1988. Financial liberalisation in retrospect: Interest rate policies in LDCs, in G. Ranis and T.P. Schultz (eds.), The state of development economics. Oxford: Basil Blackwell.

Onayemi Sherifat, O., 2013. Output growth, economic openness and financial deepening in Nigeria: A structural differential and causality analyses. European Journal of Humanities and Social Sciences, 26(1): 1381-1395.

Patrick, H.T., 1966. Financial development and economic growth in underdeveloped countries. Economic Development and Cultural Change, 14(1): 174-189.

Pesaran, M. and Y. Shin, 1999. An autoregressive distributed lag modelling approach to cointegration analysis. In Strom, S. (Eds). Paper Presented at Econometrics and Economics Theory in the 20th Century: The Ragnar Frisch Centennial Symposium, Cambridge University Press, Cambridge.

Pesaran, M., Y. Shin and R. Smith, 2001. Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3): 289-326.

Pesaran, M.H. and B. Pesaran, 1997. Working with microfit 4.0: Interactive econometric analysis. Oxford: Oxford University Press.

Pradhan, R.P., 2009. Nexus between financial development and economic growth in India: Evidence from multivariate VAR model. International Journal of Research and Reviews in Applied Sciences, 1(2): 141-151.

Singh, A., 1997. Financial liberalization, stock markets and economic development. Economic Journal, 107(442): 771-782.

Stock, J.H. and M.W. Watson, 2011. Introduction to econometrics. 3rd Edn., Boston: Addison–Wesley. pp: 644-649.

Wong, A. and X. Zhou, 2011. Development of financial market and economic growth: Review of Hong Kong, China, Japan, the United States and the United Kingdom. International Journal of Economics and Finance, 3(2): 111-115.