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Dynamics of Banking Performance Indicators and Economic Growth: long-Run Financial Development Nexus in Pakistan

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Abstract

The purpose of this research is to understand the contributing role of banking industry in economic development process in long run as well as in short run dynamics empirically on the grounds of sound theoretical basis in Pakistan. This study explored the Neoclassical and endogenous mechanism between banking sector and economic growth by using the panel unit root tests, Panel co-integration tests, panel FMOLS and DOLS tests and panel VECM test for the period 2006 to 2016. Results indicate that Lending capability, Bank Investment and Innovation are identified as significant determinant. Further results indicate that there is an existence of positive bi-directional causality relationship between banking sector and economic growth. The long-run dynamics highlights the good policy measures of financial institutions and provides sound basis for positive economic growth and hence short run relationship indicates the consistency of economic policies in the economy. Finally the results conclude that policy makers should focus less on increasing the size of banking sector and more on improving its function as intermediary. The intense competition in banking sector may create problem in the sector itself. However, the rule of demand and supply may put the parameters into equilibrium for positive growth.

Keywords: Bank investment, Economic growth, Innovation, Lending capability, Panel Co-integration, Panel VECM

Introduction

Financial development and globalization have tremendously played a vital role in development of the economies of various countries in recent decades. Financial transactions has increased the relative flow of funds in an economy and financial activities acts as the spearhead of every economic activity whereby the majority of economic activities involves money transactions such as coinage and use of currency notes among others. The liberalization of most Asian economies has led to the increased significance of banking and its influence on economic growth. The relationship between a country's financial sector and the overall performance of a country's economy has been evaluated in various studies (i.e. Aurangzeb, 2012; Tabash & Dhankar, 2014; Abedifar, Hasan & Tarazi, 2016; Boukhatem & Moussa, 2017). All these studies jointly hypothesized that the significance of this relation is not a static parameter but it is a dynamic concept. Moreover, economies with highly established financial system lead to the tendency to develop their economy at a high rate. However, Banks and other financial institutions stays in the forefront of contributing to the economic growth through their activities such as giving resources to general public and lending of funds to various organizations for their development and economic growth of the country. The financial sector which comprise of banks and other lending institutions leads to sustainable economic growth by engaging in profitable investments and equalizing savings from areas of surplus to the areas of deficits.

The credit capabilities of Pakistan financial institutions have contributed to the economic growth in recent decades. The bank credit ensures that consumers borrow more which lead to more spending as well as enterprises borrow and spend more on capital investments. The banking sector which accounts for 95% of the financial sector in Pakistan has contributed to positive link of economic growth in Pakistan (Aurangzeb, 2012). It is generally believed that innovation, bank investments, and lending schedule generate healthy contribution in the process of economic development of the economies. Previously multiple empirical researches have been conducted to investigate the impact of banking sector on the economic growth (i.e. Christopoulos & Tsionas, 2004; Abu-Bader & Abu-Qarn, 2005; Ang & McKibbin 2007; Ahmad & \Malik, 2009; Ndlovu, 2013; Onuoga, 2014; Gheeraert & Weill, 2015; Rizwan-ul-Hassan, Imam & Salim, 2017). The financial infrastructure of Pakistan demands the rapid changing of aggregate demand and supply of financial instruments to meet the challenges of major economic issues. This is possible only if financial intermediaries play their role and hence its deposit capacity by alluring the saving sector with the concept of digital currency. This element will reduce the level of hidden savings which do not take active part in the investment channels. If investment increases ultimately it will leads towards more bank related financial activities and economic growth, thus the objective of this research is to better judge the contribution of banking sector as there is a dire need to identify those banking factors which may cause sharp rise in productive activities that can enhance velocity of GDP. Furthermore, no any study available in recent past that explores long-run and short-run dilemma of banking performance towards economic growth of Pakistan.

In the past, several studies had been conducted over this subject but all of these studies indicated different results that has raised multiple questions to understand the impact of banking sector towards economic development, for instance many studies indicated strong positive (Hou and Cheng, 2017; Pradhan et., 2017) and weak relationship (Usai & Vannini, 2005), whereas some studies shown negative (Ductor & Grechyna, 2015; Khattab, Juliot & Abid, 2015) relationship. Apart from this few studies are also available that depicted both positive and negative relationship (Ranciere et al., 2006; Guillaomont-Jeannreney & Kpodar, 2006). Therefore this topic has a great capacity to refine the research based upon some sound theoretical grounds and hence it will fulfil further literature gap in the context of emerging economies like Pakistan. Moreover, most of the previous studies are based on the samples from the developed countries (Bermus & Buch, 2017; Ibrahim & Alagidede, 2017) or countries having high income (Herwartz & Walle, 2014), such studies are unable to forecast developing economies performance through banking sector.

However, (Khan et al., 2005; Khan & Qayyum, 2007; Jalil & Feridun, 2011; Hye & Wizarat, 2013; Rizwan-ul-Hassan et al., 2017) taken time series data and ignored to account the cross sectional effect. Therefore, in this study we will use panel data to observe both times series and cross sectional effects together to understand real impact of banking sector dynamics on annual economic growth of the country. The recent studies of Moshirian and Wu (2012), Herwartz and Walle (2014), Rizwan-ul-Hassan et al., (2017) did not taken into account the loan to deposit ratio (proxy of lending capability) and investment to total assets ratio (proxy of bank investment) Both of these two indicators are highly significant for our theoretical and empirical model. Therefore, keeping in view the importance of these factors, the study incorporated these variables for exploring the behavior of banking sector in development of economy.

First part of the study demonstrates the brief introduction of the topic. The second part of the study comprised of literature review while the third section of the study represents data and research methodology. Whereas, fourth segment of this study elaborates results and interpretations and conclusion of the study is described in fifth and last segment of the study.

Literature Review

There has been heated and controversial debate in academic circles and in policy-making regarding financial sector contribution towards development of economic growth. Moreover, there is a large amount of theoretical and empirical literatures over this issue which has analyzed different dynamic findings of developing and developed countries but even then this issue is still unresolved. The desire of all economies is to maintain sustainability in economic growth but in Pakistan the economic growth fluctuate rapidly in last few decades and there are numerous factors which effect the phenomenon of growth fluctuation. One of the spear head factor in fluctuation of economic growth of Pakistan is the banking sector because in last two decades several new banks are provided with licenses to execute their operations countrywide, although the growing number of financial institutions indicates the development of economy but this research is aimed at to examine the real performance of banking sector of Pakistan in development of economic growth. The various studies are conducted in different parts of the world, few empirical and theoretical studies indicated that the causality run from financial development to the economic growth process (i.e. McKinnon 1973; King and Levine 1993a; Levine et al., 2000; Christopoulos, 2004). Some other authors argued that the direction of the causality run from the economic growth to financial sector development (i.e. Gurley & Shaw, 1967; Goldsmith, 1969; Jung, 1986). Apart from this controversy few authors proved that causality run in two way direction (i.e. Patrick, 1966; Blackburn & Huang, 1998; Khan, 2001). Levine (1997, 2005) conducted an empirical study and concluded that a long-run relationship lies among financial system and economic growth of the economy. Similarly, Hassan, Sanchez & Yu (2011) used neo-classical model and found strong long-run connection among financial system and economic growth.

Goaied and Sassi (2010) conducted research in 16 MENA countries by using GMM method on dynamic panel data and concluded with non significant link between banking sector and economic growth. The study reinforced that the indicators of the banking sector are significantly and negatively related with the process of economic growth and the link between banking development and growth is quite heterogeneous.

Kar et al., (2011) examined the direction of the causality between financial sector development and economic growth from the period of 1980 to 2007 of fifteen economies of MENA countries. In order to explore various characteristics of the financial sectors of the economies, six various financial indicators were used and the empirical findings revealed that there was no apparent consensus on direction of the causality among development of the financial sector and economic growth. Moreover, study also notified that the results of the study were country specific, in contrast to that Abduh et al. (2012) investigated the relationship of conventional and Islamic banking on economic growth in Bahrain. The study explored significant positive bi-directional connection among the bank financing and long run economic growth. Though, that connection could not be proved in short run but Importantly the study proved significant impact of conventional banking development on economic growth of the countries both in long run as well as in short run. Another similar study was conducted by Tabash and Dhankar (2014) from the period 1990-2008 in Qatar. The study evaluated that long run financial development is positively associated with the economic growth and short-run granger causality indicated bidirectional link among the development of the financial sector and growth of the economy.

Few new evidences related to this topic were provided by Law and Singh (2014). They used the innovative and dynamic panel data threshold test on 87 countries sample. The findings of the study indicated the threshold effect among banking sector and economic growth relationship. In particular, the study reached to a conclusion that the financial development effect positively to the

growth up to certain threshold level and beyond that the further development in financial sector tends to effect negatively to economic growth process. Therefore, excessive financing is not necessarily beneficial for economic growth. Almost, similar results drawn by the Aizenman, Jinjarak and Park (2015). Their analysis based on 41 economies for an assessment between the two different regions which comprised of similar level of incomes. The study revealed great differences among regions in terms of the impact of financial sector depth on economic growth and verified the negative blow of the depth of the financial sector on economic growth. Moreover, the results validated non-linear association between development of the financial sector and growth. Thus, it can promote economic growth process up to a certain level.

Khattab, Juliot and Abid (2015) opened the new debate in literature; the objective of their study was to observe the nature of relationship between the financial instability, financial sector development and the economic growth of five Maghreb economies by taking the data of the period 1995-2013. Study employed panel vector autoregressive model and estimated that financial development has negative effect to financial instability but a positive effects on itself and combined effect on economic growth process. The authors stressed that financial development gets promotion through financial liberalization only in a less corrupt environment. In the same year Ductor and Grechyna (2015) investigated the interdependence between real sector, development of the financial sector and economic growth of 101 economies for the period 1970-2010. The findings suggested that the impact of the development of the financial sector on economic growth depends upon the escalation of private credit in relation to real sector development. Study further emphasized that impact of the financial sector development on growth turns negative, if the sharp pace of the private credit remain unable to accompany by real sector output growth.

In addition, Abedifar et al., (2016) conducted research on 22 countries and found that the banking sector contribute positively towards the economic growth, especially the outcome of banking sector in low income countries was better than other high income countries. In the same line Guerra (2017) evaluated the short term effects and causality between bank lending and the growth of economy by using Vector Autoregressive model in Mexico. The data taken from the period 2001 to 2016 and results of the study revealed that the economic growth had granger caused and positive effect on bank lending. However, study did not find any evidence of the effect of bank lending to GDP or causality. These findings were important and might be explained by the factors of the demand and supply in lending market.

Besides this, Pradhan et al., (2017a) determined the inter-linkages between the different factors including the inter-link between the banking system and growth for the period 1980 to 2014 of the G-20 countries. The study used granger causality test and VAR test. Results of the study indicated that the long run banking sector development had a significant effect on the economic growth process but in short run, the relationship among variables were very complex as it vary by countries in various phases of development. Moreover, the results of the study discuss policies that need to be adopted for sustainable economic growth. The second study conducted by Pradhan et al., (2017b) inspected the relationship between depth of the banking sector and economic growth by employing the panel data, the study covered ASEAN economies for time period 1961 to 2012. By using multivariate framework, the study found that all the factors were co-integrated. Further, the study elaborated a common long run equilibrium link between the depth of the banking sector and economic growth. Furthermore, study also indicated a short-run connection between these variables and the estimation method of panel data presented more robust estimations comparing to earlier researches by employing variations among countries and variation over time.

Hou and Cheng (2017) explored short run as well as long-run impact of the banking sector variables on the performance of economic growth by using GMM method. The study indicated that the effect of banking sector variables vary with development of banking sector and level of the income of the country over time. The study strongly recommended that economies must engage themselves in different financial activities to ensure sustainable process of economic growth.

The study of Durusu-Ciftci et al., (2017) developed the Solow-Swan growth model by utilizing the panel data of 40 economies to investigate the association among financial sector and their economic growth process. The results indicated that the cross sectional effects vary across different countries but overall long-run positive effect prevails between the financial sector and economic growth. Findings of the study recommended that policy makers should focus on deepening the financial markets, including improvement in the legal and institutional measures in order to strengthen the investors and creditors rights for contract enforcement. Based on extended neoclassical growth model, Liu and Zhang (2018) explored the endogenous growth process between financial system and economic growth. The study was based on panel data of 29 provinces of China. The theoretical findings of the study demonstrated that there is a presence of optimal financial structure that could meet various demands in economic development process. Moreover, results of the study also revealed significant effect of financial structure on economic growth but findings of the research also presented an inverse U-shaped relationship. Apart from that the behavior of economic development also gets change before and after the financial crisis conditions, for instance the study of Asteriou and Spanos (2018) investigated that before the crisis financial development accelerate the economic growth but after the crisis it hampered economic development process. It is to note that, in financial crisis of year 2008, the capital adequacy of banking sector saved the depositors and managed the stability of the financial sector.

Recently Dal Colle (2018) evaluated the impact of liberalization across lending activities and deposit-taking on the regime of contest in banking sector and economic growth rate. The study extended two economy based banking models in which inventively each economy host at least single operating bank. The paper introduced two different GATS-defined modes for liberalization of commercial banking namely the cross-border mode and commercial presence mode. The study also highlighted the possible strategic behavior among contesting banks in equilibrium. Moreover, extended models offered a causal relationship among cost structure of banking sector and economic growth rate of economy under alternative modes of liberalization. The study concluded that above a certain development of banking sector, the economic growth accelerate in an economy. In our study four bank-specific variables are chosen to examine their impact on economic growth, these variables are lending capability, innovation, interest margin and bank investment.

Lending Capability vs Economic Growth

The lending is a top method of banking system to influence economic activities. Therefore, the bank lending has turned into extremely useful approach in economic theory. Recently it is observed that indubitably an economy is powerless to retain its long-run economic growth without stretching lending activities (Guerra, 2017; Kapounek, Kucerova and Fidrmuc, 2017). Few studies revealed that the bank lending channel is effecting negatively to the economic growth of the countries (i.e Leitao, 2012; Tahir et al., 2015). However, Tahir et al., (2015) found short term causality between bank lending and economic growth. In addition to that Aurangzeb (2012) found bidirectional causal connection between advances and the economic growth of Pakistan. Whereas, few researches revealed that bank lending is an essential prerequisite to arouse economic growth (i.e Adams et al., 2009). Apart from this controversy Barros, Managi and Matousek (2009) highlighted

that the investigation between lending and the economic growth is vague. In this study loan to deposit ratio of banks is chosen as proxy for lending (Park, Jun & Lee, 2012). Since, deposits are the primary source of lending so, deposits unswervingly impact to lending of financial institutions (Kassim & Majid 2008;Thierry, Jun, Eric, Yannick & Landry 2016) moreover in economic boom banks use loan to deposit ratio for controlling liquidity by managing loan sizes (Park, Jun & Lee, 2012).

Innovation vs Economic Growth

Innovation in the banking sector has been observed to have a positive impact on the development of the economy of a country as measured by a country's GDP per capita growth. Financial innovations include the variety in banking services, the improved quality and efficiency, the new and modified banking products such as online transactions, M-banking or internet banking (Beck et al., 2016). Recently, positive link between innovation and economic growth have been investigated in economic literature (i.e Galindo & Mendez, 2014; Akhisar, Tunay & Tunay, 2015). Adak (2015) analyzed in his study that Technological progress; innovation and the economic growth are interrelated. Further, the author found a significant and long run relation between innovation and economic growth. In this study we are using annual online transactions of banks of Pakistan as proxy of innovation because it is the latest determinant of analyzing the branchless banking impact on economic activities in the country (Afshan & Sharif, 2016).

Interest Margin vs Economic Growth

A large number of theories are written on interest rate and its management. Few of them are modern theory, classical theory, Keynesian theory and loanable fund theory but most of the previous studies narrated the negative effect of interest rate on the economic growth (Udoka & Anyingang, 2012; Saymeh & Orabi, 2013; Anari & Kolari, 2016) but Anaripour (2011) found unilateral causal connection among economic growth and interest rate therefore decrease or increase in interest rate does not have any effect on the process of economic growth. Study of Aurangzeb (2012) revealed that the unidirectional causality run from interest earning to the process of economic growth. Furthermore, Tahir et al., (2015) signify the long run connection between interest rate and growth. The Pakistan economy has witnessed enormous interest rate swings in many sectors and it can produce different patterns of business cycles, consistent with the described regularities along with major recessions and booms. Therefore interest rate is an important feature for explaining the business cycles and their patterns in emerging economies (Neumeyer & Perri, 2005). The State bank of Pakistan (SBP) is the sole authority to decide interest rates in Pakistan and all banks charge interest rate on their products under the guidelines of SBP, therefore net interest margin ratio is selected as proxy of interest rate of each bank because it demonstrates earning capacity of banks through primary business of banking by utilizing all assets (SBP, 2015).

Bank Investment vs Economic Growth

A heated debate is on in academic circles and among officials regarding role of investment in the economic growth process. The recent modification in neo classical model and endogenous growth theory has reported the importance of investment in emerging economies (Bint-e-Ajaz & Ellahi, 2012). For sustainable economic growth, the mobilisation of domestic resources, self-reliance objectives and the efficient utilization of investments are key policy focuses (Nasir, Khalid & Mahmood, 2004). The causality exists in both way between investment and economic growth (Bint-e-Ajaz & Ellahi, 2012) but Madsen (2002) identified that the economic growth is largely

caused by the investment. The investment to total assets ratio of banks are selected as a proxy for Bank investment in the study because this ratio explicate the investment activities of banking sector with reference to their total assets. It reflects how much portion of total assets is used as investment in different activities of Banks (SBP, 2015).

Theoretical Framework

The theoretical and empirical relations between financial sector and economic growth can be observed in last many decades and has been mounting since 1980s (Khan and Senhadji, 2003; Trew, 2006). In regard to this issue, the implications of financial sector in growth of economy can be classified in to two main types (Kar, Nazlıoğlu and Ağır, 2011). First type is routed from old famous economist Schumpeter (1911) theory of economic development. Schumpeter highlighted the value of finance in development of economic process. Moreover, he emphasized the significance of financial services in boosting economic growth and highlighted the situation when financial sector may actively promote innovations and growth by examining and sponsoring productive investments. The second type is located in the work of Robinson (1952). He measured the finance as moderately unimportant variable in the economic growth phenomenon, Specifically Robinson (1952: 1986) explain that as the demand of the financial services rise the output raises too that is favorable to the process of financial development. Being all other things equal, the financial sector progress follows the productivity of growth and not the opposite (King, and Levine, 1993). This study used lending capability, bank investment, interest margin and innovation as explanatory variables whereas, the economic growth is an outcome variable. In addition to that these variables are chosen from the different theories for understanding their complete impact on emerging economies growth. The well known theories that explain the importance of these variables in economy are Anticipated Income Theory and Endogenous Growth Theory.

Anticipated Income Theory

This theory was introduced by the H.V Prochnow in 1945 and it is presented in author's book with the name "Term loan and Theories of Bank Liquidity". The theory narrated that banks must engage themselves in a wide variety of lending activities that may comprise of amortized real estate mortgage lending, long term loans for generating economic activities, installments loans and consumer loans by considering the likelihood fact of its repayment as it stimulates the cash flow that enhance the liquidity which depends upon the anticipated income of bank borrowers. This entails that high surplus reserves enhance profitability of all types of banks by enhancing the availability for lending investment funds. Therefore, keeping in view this theory the study has chosen lending capability variable for understanding the lending capability impact on the economic development of the country.

Endogenous Growth theory

This theory focuses on describing that the rate of economic growth is an outcome of endogenous factors rather than external factors. Internal factors of institutions such as the investment decisions as well as innovation or levels of technology change affect the economic growth process. Moreover, theory also holds that in any economy the long run economic growth normally depends upon the policy measures of financial institutions (Romer, 1994). The endogenous growth model expounds that internal factors affect economic growth even on the effect of exogenous productivity. The theory helps in establishing a framework of the relationship of variables that are used in the study. The link between the financial sector and the economic progress

has remained a vital concern of debate in literature. Emergence of the endogenous growth unconditionally presume causal link from the financial sector to economic progression but the causality direction is still an empirical issue. Thus, the purpose of this study is also to find out the direction of the causality among bank specific variables and economic growth. The identified internal endogenous variables are interest margin, innovation, lending capability and bank investments which are considered as independent variables and the dependent variable of this study is economic growth of the country as measured by the annual GDP growth rate.

Further, the summary of the previous researches indicating the relationship between financial sector and growth are presented in Table 1.

Table.1 Summary of Studies

Study	Method	Type of Data	Study Period	Area
Banking-Eco				
Calderon and Liu	Geweke	pooled data	1960-1994	109 countries
Naceur and	GMM	Panel data	1979-2003	11 MENA
Ang (2008)	Neo Classical		1960-2003	Malysia
Wu et al. (2010)	Panel Unit Root	Panel data	1976-2005	European Union
Chaiechi (2012)	Structurel		1990-2006	South Korea,
Hsueh et al.	Granger causality	Panel data	1980-2007	OECD countries
Jokipii &	VAR	Panel data		18 OECD
Al-Oqool Okab	Granger Causility	Panel data	1980-2012	Jordan
Gheeraert and	stochastic frontier	Panel data	2000-2005	70 countries
Lending vs				
Adams et al.,	Granger Causality	Panel Data	1830-1998	Sweden
Barros, Managi			2000-2006	Japan
Tahir et al.,	Cointegration,	Panel Data	1974-2013	Pakistan
Thierry et al.,	VECM	Panel Data		Cameroons
Interest Rate vs				
Udoka and	OLS		1970-2010	Nigeria
Semuel and	PLS		2005-2013	Indonesia
Varlik and	FAVAR Model		2001-2016	Turkey
Lee and Werner	Granger Causality		1961-2008	US, UK,
Innovation vs				
Atay and Apak	Comparative			EU and China
(Galindo &	OLM Model		1981-2008	38 countries
Adak (2015)	OLS, ADF		1980-2010	Turkey
Investment vs				
Bint-e-Ajaz &	Co-integration,		1990-2010	Pakistan
Bukari, Ali and	Panel Unit Root,	Panel Data	1971-2000	Korea,
Chen, Yao, Hu	PSTR Model		1991-2014	65 Countries

Data and Research Methodology

The study based on panel data of 24 top banks of Pakistan for the period 2006 to 2016. The data is obtained from world development indicators and annual reports of State Bank of Pakistan. To

explore the nexus between Pakistani banking sector micro variables (lending capability, bank investment, interest margin and innovation) and economic growth, the equation (1) estimates as.

$$Z_{i,t=\beta_{\circ}+\beta_1 le_{i,t}+\beta_2 inv_{i,t}+\beta_3 inn_{i,t}+\beta_4 int_{i,t}+\mu_{i,t}} \quad (1)$$

Where le denotes lending capability, inv denotes bank investment, inn denotes innovation, int denotes interest margin and the annual growth rate of GDP is taken as a proxy of the economic growth (Z).

Panel Unit Root test

The tests of Panel unit root are applied to investigate the amount of the integration among study variables as well as assessment of the stationarity properties of all variables used. The study employed various tests of panel unit root which comprised of LLC test introduced by Levin, Lin and Chu (2002); IPS test proposed by Im Pesran and Shin (2003), Fisher-type tests using ADF and PP tests proposed by Maddala and Wu (1999), Hadri (2000), Breitung (2000) and Choi (2001). The null hypothesis of the test of LLC presumes that there is a common unit root across the cross sections, whereas alternative hypothesis assume no unit root across the cross sections. The IPS, Fisher-PP and Fisher-ADF tests presume that the individual unit root process prevails across all the cross sections. The null hypothesis of all three tests state that there are unit root across the cross sections of variables whereas the alternative hypothesis state that there is no unit root across the cross sections.

Breitung (2000) demonstrated in his study if individual specific trends are included, the IPS and LLC tests lose power, it is because of bias correction which also eliminates mean under the sequence of local substitute. The author recommended a test that does not use a bias adjustment with significant high power than that of IPS or LLC tests. The alternative hypothesis of Breitung's test is that the panel set demonstrates non-stationary difference whereas null hypothesis demonstrate that the panel set is stationary.

Hadri (2000) proposed a test which is residual-based Langrange Multiplier (LM) test where the alternative hypothesis is no unit root in panel set and null hypothesis state that there is a unit root in panel set.

Panel Co-integration Test

Panel co-integration test is used to identify existence of long run relationship among economic variables of the study. The rule for identifying the co-integration is to test whether two or more than two variables diverge significantly in a certain relationship (Abadir & Taylor, 1999). In simple words, in case if the study variables are co-integrated, they move together over time so that short-term disturbance may be rectified in long-term. If the unit root exists in the panel series, then we employ panel co-integration test. Here we applied Pedroni (1999, 2004) Panel co-integration test which examined whether the connection exists between lending capability, bank investment, interest margin, innovation and economic growth.

Pedroni (1999, 2004) introduced two kinds of tests of co-integration: group tests and panel tests. The panel tests are based on "within dimension" they include Panel parametric ADF-statistic, Panel non-parametric PP- Statistic, Panel rho and Panel v-Statistic. The group tests are termed as "between dimension" (i.e. the group mean panel co-integration test-statistics) these test include group ADF-Statistic, group PP-Statistic and group rho-Statistic. All these seven test-statistics are asymptotically distributed as standard normal. The further description of the tests of panel co-integration can be found in Pedroni (1999, 2004)

The Pedroni's tests based on estimated residuals from the below long run equation:

$$Z_{it} = \alpha_i + \sum_{q=1}^{w} \beta_{qi} X_{qit} + \varepsilon_{it} \qquad (2)$$

Where i= 1,…..,N for each bank in the panel and t= 1,….,T indicates time period. The parameter α_i allows for possibility of bank-specific fixed effects. The term ε_{it} Denotes estimated residuals, which demonstrate the deviation from a long-run relationship in the process. The null hypothesis of no co-integration R_i=1 is evaluated by employing the unit root test on residuals as follows:

$$\varepsilon_{it} = R_i \varepsilon_{i(t-1)} + M_{it} \qquad (3)$$

In this study we used three tests of co-integration. The first test is Pedroni (2004) second test is Kao (1999) that based on two-step process of Engle-Granger and it enforces homogeneity on units in panel set. Moreover, it is a generalization of Augmented Dickey-Fuller and Dickey-Fuller tests in panel data framework. The third test is Fisher's test that combined the p-values of individual Johansen maximum likelihood co-integration test statistics (Maddala & Wu, 1999). The Fisher test does not presume homogeneity in coefficients as it is a non-parametric test. All the tests state null hypothesis of no co-integration and use the residuals obtained from the panel regression to determine the distribution and construction of the test statistics. All the test statistics got asymptotic distribution after suitable standardization. In this study we used bi-variate test statistics of Fisher's test for measuring the co-integration of each variable with the annual economic growth.

Panel Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS) Estimation

There are number of options available for estimating the co-integration vector by using the panel data set including with-and between group for instance FMOLS estimation technique (Pedroni, 2001) and DOLS estimation technique (Kao & Chiang, 2000; Mark & Sul, 2002). If the co-integration exists among the variables of the study then we use FMOLS and DOLS estimations to identify long-run association between economic growth, innovation, lending capability, interest margin and bank investment.

In co-integrated panel data set, the use of OLS method for estimating the long-run equation leads to a biased estimator of the parameters unless the repressors are strictly exogenous. Thus, the OLS estimation technique is unable to produce valid inference.

The FMOLS estimation is a non-parametric approach. Further, in order to deal with the corrections of serial correlation, FMOLS considers the possible correlation between the first difference of the regressors, the error term as well as the presence of the constant term (Maeso-Fernandez et al., 2006). Both these test generates consistent estimates of the standard error which can be utilized for assumption. The DOLS is a fully parametric approach and it proposes a computationally fitting substitute to panel FMOLS (Philips & Moon, 1999; Pedroni 2004) but the demerit of DOLS estimator is that the degree of freedom gets lowered by leads and lags (Maeso-Fernandez et al., 2004, 2006).

In order to estimate DOLS and FMOLS let us take the following fixed effect panel regression:

$$z_{it} = \alpha_i + g_{it}\beta + \mu_{it} \qquad i = 1, \ldots\ldots, N, \qquad t = 1, \ldots\ldots, T \qquad (4)$$

Where β is a vector of the slope (k, 1) dimension, z_{it} represents the matrix (1, 1), μ_{it} denotes the stationary disturbance terms and α_i represents the individual fixed effect. It is presumed that g_{it} (k,1) vector is the integrated schemes of order one for all i, where:

$$g_{it} = g_{it-1} + \varepsilon_{it} \qquad (5)$$

The specification of equation 3 demonstrates a structure of co-integration regression, i.e z_{it} is co-integrated with g_{it}. By investigating the limited distribution of DOLS and FMOLS estimators of co-integrated regressions the study of Kao and Chiang (2000) found that they are asymptotically normal. The estimator of FMOLS is structured by making corrections for autocorrelation and endogeneity to OLS estimator and is written as:

$$\lambda_{FMOLS} = [\sum_{i=1}^{N}\sum_{t=1}^{T}(u_{it} - \bar{u}_i)]^{\bar{1}}[\sum_{i=1}^{N}\{\sum_{t=1}^{T}(u_{it} - \bar{u}_i)z_{\star it} + T\Delta_{\varepsilon\mu}\}] \qquad (6)$$

Where $z_{\star it}$ is the transformed variable of z_{it} for achieving endogeneity correction and $\Delta_{\varepsilon\mu}$ is a autocorrelation correction term. On the other hand DOLS estimator is quite useful for correcting the endogeneity and autocorrelation. The DOLS model use parametric correction to the errors including future and past values of first differenced regressors for obtaining an impartial estimator of long-run parameters. Following equation can be used for obtaining the DOLS estimators:

$$Z_{it} = \alpha_i + \beta i x_{it} + \sum_{k=q}^{q} h_{ik}\,\Delta x_{it+k} + \mu_{it} \qquad t = 1 \ldots\ldots T \quad i = 1 \ldots\ldots N \quad (7)$$

Where μ_{it} represents the disturbance terms, α_i represents the bank-specific effect and h_{ik} indicates the coefficients of lag or lead of the first I(1) differenced explanatory variables. The DOLS coefficient estimated as:

$$\lambda_{DOLS} = \sum_{i=1}^{N}(\sum_{t=1}^{T} P_{it}\,\dot{P}_{it})^{\bar{1}}\,(\sum_{t=1}^{T} P_{it}\,y_{\star it}) \qquad (8)$$

where $P_{it} = \left[x_{it} - \bar{x}_{it}\Delta x_{i,t-q} \ldots\ldots, \Delta x_{i,t+q}\right] \quad is\ 2(q+1) * 1$ regressor's vector

Causal Effects

Panel vector error correction model is used to investigate the causal relationship (Pesaran et al., 1999). Engle and Granger two step processes (Engle & Granger, 1987) is used to estimate long-run model as described in equation 2 which is also used for obtaining estimated residuals. In second step the lagged residuals are defined as error correction term in equation 2. The following equation demonstrate dynamic error correction model:

$$\Delta Z_{it} = \xi_{1j} + \sum_{d=1}^{v}\Psi_{11id}\,\Delta Z_{it-d} + \sum_{d=1}^{v}\Psi_{12id}\,\Delta le_{it-d} + \sum_{d=1}^{v}\Psi_{13id}\,\Delta inv_{it-d} + \sum_{d=1}^{v}\Psi_{14id}\,\Delta inn_{it-d} + \sum_{d=1}^{v}\Psi_{15id}\,\Delta int_{it-d} + \gamma_{1i}\varepsilon_{it-1} + \mu_{1it} \qquad (9a)$$

$$\Delta le_{it} = \xi_{2j} + \sum_{d=1}^{v}\Psi_{21id}\,\Delta Z_{it-d} + \sum_{d=1}^{v}\Psi_{22id}\,\Delta le_{it-d} + \sum_{d=1}^{v}\Psi_{23id}\,\Delta inv_{it-d} + \sum_{d=1}^{v}\Psi_{24id}\,\Delta inn_{it-d} + \sum_{d=1}^{v}\Psi_{25id}\,\Delta int_{it-d} + \gamma_{2i}\varepsilon_{it-1} + \mu_{2it} \qquad (9b)$$

$$\Delta inv_{it} = \xi_{3j} + \sum_{d=1}^{v} \Psi_{31id}\, \Delta Z_{it-d} + \sum_{d=1}^{v} \Psi_{32id}\, \Delta le_{it-d} + \sum_{d=1}^{v} \Psi_{33id}\, \Delta inv_{it-d} + \sum_{d=1}^{v} \Psi_{34id}\, \Delta inn_{it-d} + \sum_{d=1}^{v} \Psi_{35id}\, \Delta int_{it-d} + \gamma_{3i}\varepsilon_{it-1} + \mu_{3it} \quad (9c)$$

$$\Delta inn_{it} = \xi_{4j} + \sum_{d=1}^{v} \Psi_{41id}\, \Delta Z_{it-d} + \sum_{d=1}^{v} \Psi_{42id}\, \Delta le_{it-d} + \sum_{d=1}^{v} \Psi_{43id}\, \Delta inv_{it-d} + \sum_{d=1}^{v} \Psi_{44id}\, \Delta inn_{it-d} + \sum_{d=1}^{v} \Psi_{45id}\, int_{it-d} + \gamma_{4i}\varepsilon_{it-1} + \mu_{4it} \quad (9d)$$

$$\Delta int_{it} = \xi_{5j} + \sum_{d=1}^{v} \Psi_{51id}\, \Delta Z_{it-d} + \sum_{d=1}^{v} \Psi_{52id}\, \Delta le_{it-d} + \sum_{d=1}^{v} \Psi_{53id}\, \Delta inv_{it-d} + \sum_{d=1}^{v} \Psi_{54id}\, \Delta inn_{it-d} + \sum_{d=1}^{v} \Psi_{55id}\, \Delta int_{it-d} + \gamma_{5i}\varepsilon_{it-1} + \mu_{5it} \quad (9e)$$

Where μ is an uncorrelated serial error term and d is a lag length placed on single based likelihood test ratio. The Δ denotes first differenced. The short-run causality is examined through the statistical significance of partial F-statistics related with subsequent right hand side variables from the equation (9a) to (9e) whereas the long run causality is examined through the significance of the statistics of relevant error correction terms by use of t-test or p-value. The absence (or presence) of long-run causality can be recognized by determining the significance of t-statistics on the coefficient γ of error correction term, ε_{it-1} from (9a) to (9e) equations.

Table 2. Determinants of Banking Sector/Hypotheses & Examples

Determinants of Banking Sector	Hypothesis/Theory	Examples
Bank Investment	H_1:The Investment activities of banks impact positively in short-run and long-run to economic growth process of the country.	(Bint-e-Ajaz & Ellahi, 2012; Nasir et al., 2012)
Interest margin	H_2:The Interest margin of banks effect negatively to the process of economic development	(Neumeyer & Perri, 2005; Anari & Kolari, 2016)
Innovation	H_3: The innovation and technological development effect positively to economic growth both in short and long-run.	(Adak, 2015; Afshan & Sharif, 2016; Beck et al., 2016)
Bank Lending	H_4: The Bank lending channel effect negatively in short-run as well as in long-run to economic growth of low income countries.	(Herwartz & Walle, 2014; Tahir et al., 2015)

Table 3 Direction of Theories towards Economic Growth and Empirical Findings

Determinant	Measure/Proxy	Name of the Theory	Direction of the theory	Frequent Findings
Lending capability	(Loan to deposit ratio)	Anticipated Income Theory	Positive	Positive-Negative
Bank Investment	(Investment to total assets raio)	Endogenous Growth Theory, Neo Classical Theory	Positive	Positive
Interest margin	(Net interest margin ratio)	Loanable Fund Theory, Keynesian Theory	Negative	Negative
Bank Innovation	(Annual online transactions)	Endogenous Growth Theory	Positive	Positive

Empirical Results and Discussion

All econometrical tests in this study are applied through Eviews 10 software. The results of Breitung, Hadri, PP-Fisher, ADF-Fisher, IPS and LLC unit root tests of all variables are presented in Table 4. The each test is performed at level and at first difference of economic growth, innovation, bank investment, interest margin and lending capability. The results demonstrated the behavior of variables at level and first difference.

Table 4. Panel Unit Root Test

At Level	LLC	IPS	ADF-	PP-	Hadri	Heteroscedasti	Breitung
Eco.Growt	-2.99097	-1.8988	55.1133	61.3356	9.07039	9.07039	1.53432
	(0.0014)	(0.0288)	(0.2236)	(0.0936)	(0.0000)	(0.0000)*	(0.9375)
Innovation	2.23994	7.06661	3.22501	1.12092	9.36398	9.36398	-3.85225
	(0.9875)	(1.0000)	(1.0000)	(1.0000)	(0.0000)	(0.0000)*	(0.0001)
Investment	-3.74102	0.54503	38.8245	35.1531	7.88779	7.41595	-1.48338
	(0.0001)	(0.7071)	(0.8250)	(0.9164)	(0.0000)	(0.0000)*	(0.0690)
Interest	-6.06305	-3.4535	88.3393	113.309	11.5059	19.3332	-0.76702
	(0.0000)	(0.0003)	(0.0003)	(0.0000)	(0.0000)	(0.0000)*	(0.2215)
Lending	-3.94895	-1.55352	78.6802	89.566	9.31742	14.8705	0.01739
	(0.0000)	(0.0601)	(0.0034)	(0.0003)	(0.0000)	(0.0000)*	(0.5069)
First diff							
Eco.Growt	-13.7262	-8.11654	170.465	173.884	6.6017	6.6017	-21.9769
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)*	(0.0000)
Innovation	-15.3081	-7.7332	151.44	227.548	5.30358	5.30358	-10.6249
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)*	(0.0000)
Investment	-13.1922	-7.889	163.185	224.424	3.19201	5.53091	-3.10335
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0007)	(0.0000)*	(0.0010)
Interest	-15.0182	-8.15871	161.78	203.291	17.8088	38.7234	-4.54913
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)*	(0.0000)
Lending	-12.4951	-7.50417	150.328	202.638	13.3912	27.6903	-5.15883
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)*	(0.0000)

*Significant at 1% level

The null hypothesis of panel unit root tests state that variables of the study follow the unit root process. At level the outcome of the tests reject null hypothesis because most of the tests verify their non-stationarity at level but at first difference all tests accept null hypothesis at 1% level of significance. Hence, we can conclude that at first difference all variables are stationary and integrated of order one I(1). Further, the probability of Fisher-type test is determined by use of the asymptotic chi-square distribution. In order to investigate the robustness, this study employed three types of panel co-integration techniques, first the study used Pedroni's (2004) then Kao's (1999) and in last a well known technique of panel co-integration, "Johansen's Fisher" test is used for examining the co-integration among variables. Table 4 reported "between dimension" as well as 5"within dimension" outcomes of panel co-integration test. The results of Pedroni's test specify that co-integration exist among the study variables because the p values of panel pp-statistics, panel ADF-statistics, group pp-statistics and group ADF-statistics are significant at 1% level of significance. Hence, we reject null hypothesis.

Table 5. Co-integration Test

Test Statistics	Statistic	Prob.	Weighted	Prob.
Panel v-Statistics	-0.53671	0.7043	-0.77519	0.7809
Panel rho-Statistics	2.586464	0.9952	2.46865	0.9932
Panel PP-Statistics	-8.3807	0.0000	-9.90806	0.0000
Panel ADF-Statistics	-7.38909	0.0000	-8.21578	0.0000
Group rho-Statistics	4.439999	1.0000	-	-
Group PP-Statistics	-19.7366	0.0000	-	-
Group ADF-Statistics	-10.8212	0.0000	-	-

*Significant at 1% level

The result of Kao's (1999) test is presented in Table 6 that indicated the presence of co-integration among variable as the p value is significant at 5% level. Therefore, we reject null hypothesis.

Table 6. Kao Test

Kao Statistics			**t-Statistic**	**Prob.**
ADF			-2.27593	0.0114

**Significant at 5% level

Table 7 presented the outcome of Fisher panel co-integration test that further suggest the presence of bivariate co-integration between the annual economic growth and all variables of the study at 1% level of significance. Thus, the study identified panel long-run equilibrium relationship between the variables which indicates that the economic growth move jointly in long run with the bank investment, interest margin, innovation and lending capability.

Table 8 contains the outcome of FMOLS and DOLS tests. The results reveal that the bank investment, interest margin, innovation and lending capability are correlated with economic growth of the country. It is essential to note that the drawback of DOLS technique is that it diminishes number of degrees of freedom for the study variables by including leads and lags and ultimately lead to less vigorous estimates. However, DOLS method allows us to identify direction and general trend of the causality acquired by FMOLS. In FMOLS model all the estimated coefficients are statistically

significant and positive apart from interest margin. However, in DOLS model all variables are statistically significant at 1% and 5% level but the impact of interest margin and bank investment is negative. In simple the study indicates that there is a healthy long-run link lies among bank investment, interest margin, innovation, lending capability and economic growth of Pakistan.

Table 7. Johansen's Fisher test of panel Co-integration

Variables	Hypothesis	Trace test	p – values	Eigen test	P-Values	Remarks
E-Interest margin	None	348	0.00	321.1	0.00	Co-integration exist
	at most	121.9	0.00	121.9	0.00	
E – bank Investment	None	402.5	0.00	377	0.00	Co-integration exist
	at most	125.2	0.00	125.2	0.00	
E –Lending capability	None	324.9	0.00	282.3	0.00	Co-integration exist
	at most	136.4	0.00	136.4	0.00	
E-Innovation	None	251.1	0.00	275	0.00	Co-integration exist
	at most	22.45	0.99	22.45	0.99	

*Significant at 1% level

Note: E represent economic growth

Table 8. FMOLS and DOLS

Dep.Variable Eco.Growth	FMOLS Results		DOLS Results	
	Coefficient	Prob.	Coefficient	Prob.
Lending Capability	2.168183	0.0000	3.720424	0.0000
Innovation	0.117542	0.0000	0.344943	0.0000
Interest margin	-25.9052	0.0000	-30.9800	0.0431
Bank Investment	1.261449	0.0000	-2.89057	0.0120

*Significant at 1% level

By taking into account the results of panel co-integration, the study employed panel VECM to find direction of causality. The outcome of five simultaneous panel VECM equations for identifying causal relationship among economic growth, lending capability, bank investment, innovation and interest margin are reported in Table 9. The results reveal the panel data tests of long run and short run granger causality. Moreover, lag structure 1 is selected by considering the Schwarz and Akaike information Criterions.

In this study, the wald test is used to determine the significance of causality. According to Table 9 the equation (9a) indicates that lending capability, bank investment and innovation have statistically significant effect on economic growth in short run. It indicates the significance of lending capability, innovation and bank investment in the process of economic growth in the country. In addition, the error correction term of the equation is statistically significant and negative at 1% significance level that shows there is a speed of adjustment towards the long run equilibrium.

The equation (9b) reveals that economic growth and innovation have statistically significant and positive impact in short-run on lending capability. However, bank investment and interest margin have insignificant but positive impact on lending capability of banking sector. The error correction term also confirm long-run relationship and indicates that there is a statistically significant and negative relationship at 1% level of significance that confirms the speed of adjustment of the variables towards long-run equilibrium.

Results of the equation (9c) demonstrate that economic growth and innovation have statistically significant and positive impact on bank investment at 1% level of significance in short-run. Moreover, there is an evidence of speed of adjustment towards long-run equilibrium position because error correction term is negative and statistically significant at 1% significance level.

The outcome of the equation (9d) is relatively different from earlier results because it does not indicate long run equilibrium, the reason behind is that, error correction term is negative but p-value is insignificant. However, the short-run causality exists among variables. The results depicts that in short-run the economic growth, lending capability and interest margin have positive and statistically significant impact on innovation at 1% and 5% significance level.

Similarly the equation (9e) also indicates the non-existence of long-run equilibrium because the error correction term of the equation is statistically significant but not negative. On the other hand economic growth and innovation have positive as well as statistically significant effect on interest margin at 1% level of significance. Overall the results of the study found the presence of bidirectional causality between the process of economic growth and variables of banking sector in both long-run as well as in short-run.

Table 9. Panel Causality Test

Dependent Variable	Short run Causality					Long run	
	Causation source (Indepenedent Variables)					Error Correction	
	ΔEco.Growt	ΔLending	ΔBank	ΔInnovatio	ΔInterest	Coeff.	Prob
ΔEco.Growt		(0.0911)**	(0.000)*	(0.000)*	(0.813)	-	(0.000)
Chi.sq		4.7908	23.0130	101.3205	0.4122		
ΔLending	(0.026)**		(0.3792)	(0.030)**	(0.235)	-	(0.000)
Chi.sq	7.2903		1.93950	6.994413	2.8907		
ΔBank	(0.002)*	(0.251)		(0.003)*	(0.240)	-	(0.003)
Chi.sq	12.0601	2.757785		11.63015	2.8531		
ΔInnovation	(0.000)*	(0.001)*	(0.550)		(0.049)*	-	(0.214)
Chi.sq	563.6827	12.9092	1.1944		6.0300		
ΔInterest	(0.000)*	(0.286)	(0.692)	(0.000)*		0.00779	(0.000)
Chi.sq	17.3835	2.5010	0.7341	15.94816			

*1% Significance level
**5% Significance level
***10% Significance level

Conclusion

In this study, we examined the co-integration and causal relationship between lending capability, bank investment, innovation, interest margin and economic growth of Pakistan for the period 2006 to 2016. For this purpose the study used different panel unit root tests, panel co-integration tests and causality test to analyze the long-run and short-run dynamics between banking development variables and economic growth. After thorough analysis and interpretations, the study

determined that at first difference variables are stationary and integrated of order one I(1). In order to identify the robustness the study applied three types of panel co-integration techniques, i.e. Pedroni (2004), Kao (1999) and Johansen's Fisher panel co-integration technique. All the tests verified the presence of co-integration which specified that the process under inspection is stationary. The results of VECM indicated that the lending capability, bank investment and innovation have positive and statistically significant effect on the economic growth in short-run as well as in long-run. This indicates the importance of banking sector in the economic development process of the Pakistan. Thus, overall bi-directional causality relationship exists between the banking sector of Pakistan and economic growth. Results of this study are consistent with (Abduh et al. 2012; Tabash & Dhankar, 2014; Hou & Cheng, 2017; Pradhan et al., 2017) and inconsistent with (Goaied & Sassi, 2010; Kar, Nazlioglu & Agir, 2011; Khattab, Juliot & Abid, 2015).

The empirical findings depicted that bank investment effects positively to economic growth in long run and short run. Hence, we accepted H_1. Further, these empirical results support the argument of Endogenous Growth Theory and Neo-Classical Theory because the increasing rate of bank investment always open new channels of business activities which promote economic development process by allocating funds to entrepreneurs to encourage them to take initiatives in society. Apart from other variables the interest margin is proved to be positive but insignificant in relationship with economic growth therefore, the study rejected the H_2. In recent years, innovation and technological progress influenced all types of business; thus, modern technological developments boost up the operations of business at minimum cost. Almost all the banking sector introduced new and innovative products to attract the clientele for generating business and financial activities. The study notified positive short-run and long-run link of innovation with the economic growth. Thus, the study accepted H_3. In view of this empirical finding we observed that the online transactions of financial institutions increased greatly in last ten years and it allows customers to perform transaction anywhere they like, either they are far away from banks or after closing banking hours. So, this facility expands the volume of financial transactions that eventually increases economic activities in country and lead towards the tremendous economic growth. However, findings of this study rejected H_4 because the results of the study reflected the presence of short-run and long-run impact of lending capability on economic growth. Therefore, findings of the study support the growth parameters of Anticipated Income Theory and confirmed that different forms of lending activities of banking sector accelerate the pace of economic growth in less developed economy. Although many previous studies reflecting the positive impact of banking sector on economic growth but in this study we are highlighting and suggesting some key precautionary measures to banking regulatory authorities of Pakistan. Few studies of other regions of the world have indicated the U-shaped relationship between banking sector and economic growth (Law & Singh, 2014; Aizenman, Jinjarak & Park, 2015; Liu & Zhang, 2018). Keeping in view these findings, it might possible, if the banking sector development cross a certain threshold limit, it can bring negative effect to economic growth. Hence, in a situation when the banking sector of Pakistan is contributing at optimum level in economic progression, the State Bank of Pakistan and Government of Pakistan should remain vigilant at this point of time because excessive bank lending and investment may lead to non-performing loans which can harm the process of economic development in the country. Therefore, findings of the study suggest that policy makers should focus less on increasing the size of banking sector and more on improving its function as intermediary for maintaining the sustainable economic growth. The intense competition in banking sector may create problem in the sector itself. Therefore the rule of demand and supply may be applied to extract positive results (Law & Singh, 2014;Ductor & Grechyna, 2015).

Overall it is concluded that the economic growth is subordinate to banking development in developing countries and favors theory of economic development. Moreover, this study also conclude that the presence of long run dynamics reflects the good policy measures of financial institutions and provides more grounds for positive economic growth on the other hand short run relationship indicates the consistency of economic policies in the economy (Romer, 1994). The empirical findings of the study could be improved further by taking few more variable such as size and depth of banks. Furthermore, the scope of the study is just covering the banking sector indicators and it is not incorporating the equity market that can also play a major role in operating the economic growth phenomenon.

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