Impact of Financial Intermediation and
Financial Sector Efficiency on Economic Growth in Pakistan

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ABSTRACT

The financial sector plays a significant role in the economic development of a country. The aim of the study is to investigate the impact of financial intermediation and financial sector efficiency on economic growth in Pakistan. The study examines time series data from 1973 to 2014 to examine long-run cointegration by employing ARDL approach GDP per capita is used for economic growth while credit to the private sector is used as a proxy for financial intermediation. Efficiency is measured by interest rate spread which is equal to the difference between the lending interest rate and deposit interest rate. The results showed that financial intermediation has a positive significant impact on the economic growth of Pakistan in both long run and short run while financial sector efficiency has a positive impact on economic growth only in the long run. The study concluded that Pakistan should develop modern and stable financial institutions in order to enhance the ability of the financial sector to lend more which in turn creates investment opportunities that contribute to economic growth and development eventually.

INTRODUCTION

The primary duty of financial system of a country is to transfer excess money stocks from savers to the borrowers (investor/spenders) for making goods and services and also investment rises by purchasing new tools or equipment and other amenities that causes growth of the economy and also living standard of people gets better, So financial system is most important concept of the modern society (Vincent, 2013).

The financial sector has two types of financing. The two types of financing are direct financing which refers to financial markets and indirect financing which refers to financial intermediaries, play an important role in boosting the economy. Financial intermediary reduces costs associated with saving and investment decisions while financial markets help to cause the full distribution of existing wealth that stimulate economic augmentation of a country (Saqib, 2013).

A financial intermediary acts as an agent between parties for channeling financial transactions. The funds are given by the financial institutions often take a form either loans or mortgages. It is called a financial dis-intermediation if the transactions take place between parties directly, e. g debt or equity markets. Financial advisor, banks, life insurance companies, investment banks, credit unions, mutual funds, brokers and stock exchanges are the best examples of financial intermediaries.

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There are four major functions of financial intermediaries which serve as channels through which economic growth increases. First financial intermediary acts as fund transferring body that is the excess fund transfers to deficit units from surplus units. Second, it encourages the movement of savings by offering more attractive and inventive instruments and incentives. Third, it lowers the cost of the project's assessment and controls the projects through corporate governance. The fourth function of a financial intermediary is that by having certain and strong information it creates more chances to reduce risk management and liquidity level which comes through the development of markets along with attractive instruments (Ali et al, 2013).

Financial services are essential to economic development. The financing of certain types e. g through banking; saving and investment, insurance, and debt and equity financing have many advantages to the public rich or poor. These financial services help citizen to save money, which in turn build credits for the businesses to commence, enlarge, to become efficient and are able to contend in local and international markets. Good financial services also help the poor to control their existing assets in terms of generation of income and eventually make a way to remove themselves from poverty (Ghatak and Siddique, 2007).

The relationship between financial intermediation, economic growth, and development varies across countries because of varied economic structures. For the developing countries, financial sector development and efficiency are very vital to achieve sustainable long term economic growth. The task of financial intermediaries in the economy is very vital, they reduce transaction costs, allow risk involvement, solves the problem of adverse selection and moral hazard. The financial intermediaries make financial markets work and without them, financial markets do not increase fund transfer mechanism. As a result financial intermediaries let small savers and borrowers contribute to financial markets which results in an improvement in economic efficiency (Mishkin, 2007).

Pakistan is an undersized country which contains a set of problems such as high unemployment, low level, and low-quality education, inefficient banking sector, unstable political system, rural-based industries, and less updated technology. In every economy, financial reforms and financial liberalization like policies are best policies to be implemented to achieve economic growth. In Pakistan, an eager financial reform was started in 1989 (Munir et al, 2013). The reforms aimed to increase the proficiency by changing interest rates to a market based and competition of financial schemes by recapitalizing and re organizing the nationalized commercial banks in order to create and encourage the development of a secondary market for government securities, to improve prudential regulations and to reduce control on credit through regularly eliminating focused and subsidized credit schemes.

Brief history of the financial sector of Pakistan

Pakistani financial sector has the largest share of banks which is 88 percent and remaining 12 percent consists of non-bank financial institutions (NBFI) such as leasing companies, Mudarabas, insurance companies, investment banks, housing finance companies, business enterprise capital companies, and joint funds. The banking sector includes 34 commercial banks and 4 specialized banks.

Yaseen Anwar former governor of SBP presented a concise history of the banking system on 29 December 2011.

- 1947-73: in this epoch, the structure of the financial system after the division was the main focal point because very few banks were operating at that time. There were 14 banks having 81 branches in 1947 which then by 1973 increased to 3233 internal branches and 74 foreign branches. Only significant sector receive the most credit given by financial institutions at that time. Most of these DFIS ran into problems in the 1980s and 90s.

- 1973 - 90: In Jan 1974 banks were nationalized in which 14 banks merged into 5 national banks. The weaker areas were deprived of credit, only rich people were given credit.

- 1991 -date: In this era reforms announced under the macroeconomic and financial sector restructuring guidance of IMF. The World Bank and the Japanese government also co-financed the banking sector adjustment loans (BSAL) to support government efforts. The reforms were about banking systems. The bank's assets of the private sector increased from 0 in 1991 to 80% by 2004 in Pakistan. The role of SBP as banking controller was also powered or strengthens. FDI in banks was sanctioned and professionals were pulled out to head and run banks. The increase in capital norms creates by better regulation.

- There were two phases of the reform program. The first phase initiated in 1997 which was related to the recovery of non-performing loans, retrenchment of surplus staff, closure of over-extended branches, privatization of banks, the introduction of international accounting standards, strengthening of prudential regulations, and the establishment of banking courts (Khan et al 2007).

- The second phase began in 2000. The reforms in this period focused on reducing the cost structure of state-owned banks for the sake of efficiency and to facilitate their sale, complete privatization of partially privatized banks, liberalizing bank branching policy, reduction in taxes on banks, facilitating loan collateral foreclosure, integration of national savings schemes to the financial markets (Khan et al 2007).

OBJECTIVES OF THE STUDY

Based on the above theoretical discussion and existing literature the objectives of the study are,

i. To examine the long run impact of financial intermediation on the economic growth of Pakistan.
ii. To examine whether the efficiency of the financial sector has an impact on economic growth or not in Pakistan.

LITERATURE REVIEW

Aziz et al (2002) conducted research on the association between economic growth and financial development in China after reforms era 1978. The economic growth is measured by investment/productivity and financial development is measured by total bank lending and other control variables were population rate, GDP per capita and inflation rate. The study reached the conclusion that there exists an affirmative association between growth and

financial development. The internal credit relative to foreign investment has a positive small effect on growth for fast growing states in China and it was also statistically significant.

James et al (2004) studied the vibrant bond of financial intermediation with growth in Australia; a country which has both bank intensive and market intensive monetary structure. The time spanned from 1960 to 1999 employing VAR model. The study provided proof of the empirical connection of financial market with growth in Australia. The outcome highlighted that growth causes the enlargement of the financial sector and also financial markets cause economic growth. Khan et al (2005) tested the empirical nexus of financial enlargement with the growth of Pakistan from 1971 to 2004. The study used the ARDL approach. The results implied that the real deposit rate and financial depth determine the long-run growth of the economy. The investment was statistically insignificant in the long run however it has short-run effects. Financial reforms, interest rate are positively related to growth. The study also applied the stability test CUSUMQ to check stable long run association. Waheed and Younus (2009) analyzed the impact of financial improvement on growth in Pakistan during 1971-2006. The study concluded that a robust long-run connection between growth and financial sector improvement prevails in Pakistan.

Jalil et al (2011) investigated the alliance of growth with financial development in case of Pakistan. The investigation period was 1975 to 2008 using principle components analysis. ARDL bound test was employed. The results indicated the existence of a positive and noteworthy connection between economic growth and financial development.

Shaheen et al (2011) used the ARDL technique to explore the long run association amongst economic growth, international trade and financial development during the period 1973 to 2009 in Pakistan. Broad money is used to proxy financial development, GDP for economic growth and sum of imports and exports are used to measure international trade. The results showed that there exist long run relationships among variables of interest. Also, a unidirectional relationship is observed from financial development to international trade and from international trade to economic growth in the study. The study concluded that financial development and international trade both had significantly impacted economic growth.

Shittu and Ayodele (2012) attempted to check the connection between economic growth and financial intermediation in Nigeria from 1970 to 2010. The time series spanned from 1970 to 2010. ECM and Engle granger technique was employed in the study. Economic growth is measured by real GDP. Financial intermediation is gauged by the ratio of credit to GDP and ratio of the money supply to GDP. Two control variables are also used in the study capital stock and trade ratio. The result showed that Broad money was only significant while control variables were irrelevant and the study concluded that intermediation affected economic growth in Nigeria in the study period.

Mahran (2012) empirically investigated the impact of financial intermediation and other macroeconomic variables on the growth of the economy in Saudi Arabia from 1968 to 2010. The study adopted the ARDL method to co integration and the related error correction model (ECM). The result showed that financial intermediation impacted economic growth negatively and all other control variables positively impacted economic growth. The reason was the functional and structural characteristics of financial systems in Saudi Arabia.

Vincent et al (2013) explored the impact of financial intermediation on private investment in Nigeria from 1980-2010. The study includes a multiple regression model to find out the long-run relationships among variables. The model included private investment as depended variable and the independent variables were financial saving as the ratio of GDP, credit extended to the private sector, prime lending rate, real GDP and a dummy variable for financial reform. The study found that financial saving is negatively and private credit is positively related to investment in Nigeria. The study concluded that CBN N25 billion recapitalization policy effects are opposite to investment in Nigeria.

Ali and Ali (2013) constructed a study to evaluate the short run and long run link connecting financial development and growth of Sudan, period spanned from 1970 to 2011. Using the ARDL approach to cointegration the study found that credit and liquidity have positive effects while trade, inflation, money supply all exerted negative results.

Munir et al (2013) investigated the linkage between growth and financial liberalization in Pakistan from 1972 to 2010. Using time series data ADF test is applied for unit root and Johansen cointegration test is employed to confirm a long run relationship. Short run change is found through the VECM approach. The observed results indicated that both the main variables are positively associated in Pakistan while Deposit rate and the lending rate has positive and negative results respectively.

Nwite (2014) tested the empirical relationship between financial intermediaries and economic growth in Nigeria from 1999 to 2014. The study used ordinary least square method for estimation. In the study economic growth is measured by GDP and financial intermediation is measured by taking three indicators credit to private sector CPS, lending rate LR and interest rate margin IMR. The study concluded that economic growth is increasing more through financial intermediation in Nigeria.

Azhar (2014) empirically tested the association between economic growth and financial development in Pakistan from 1979 to 2008. The study used financial sector development index a proxy taken for the sector development. The study adopted the ARDL Co integration approach. The results showed that in the long run economic growth and real deposit rate are correlated but the impact was insignificant. Real interest rate responded weakly relative to financial development.

Umar et al (2015) explained the long and short run nexus between financial intermediaries and growth during the period of 1970 and 2013 in Nigeria using ARDL bound test technique to co integration and granger causality test for causality. Financial intermediation is measured by domestic credit, lending rate, the value of shares traded and total insurance premium and economic growth is proxied by real GDP in the study. The results showed that there exist long run and short run effects of financial development which in turn creates an increase in economic growth in Nigeria.

In the light of above empirical literature, it is concluded that financial intermediaries and financial sector development have played a central role in making better the economies of many countries like Nigeria, Sudan, Australia, Pakistan and other developing, developed and emerging countries. The most common proxies that are exercised in the literature to calculate

the impact of financial intermediaries or development are private credit, broad money supply M2, and liquid liabilities. To measure the efficiency of the financial sector interest rate spread is a suitable indicator used. And the impact of other control variables related to growth such as investment, state expenditure, trade openness, and inflation is also tested. For Pakistan, the only indicators that are used to determine financial intermediation or development are the broad money supply and financial depth which is the difference between liquid liabilities and currency in circulation and no latest and up to date research is done to empirically investigate the role of financial intermediaries or institutions in Pakistan.

MODEL AND METHODOLOGY

The study investigates the long run relationship among financial intermediation, financial sector efficiency and economic growth in Pakistan during the period 1973 to 2014. On the basis of theoretical and empirical discussion mentioned above and following the studies of Khan et al 2005, Shaheen et al 2011, Mehran 2012, Ali et al 2013 and Saqib 2013, this study uses two multiple regression models. The economic growth is measured by real GDP per capita. The analysis is carried out using a standard indicator credit to the private sector to measure financial intermediation and one indicator interest rate spread to measure financial sector efficiency, and other control variables are also examined. The functional forms of models are,

The econometric forms of models are as followed,

$$LnRGDPPC = \beta_0 + \beta_1 LnCPS + \beta_2 LnI + \beta_3 LnG + \beta_4 LnTO + \beta_5 t + e_t \qquad (3.1)\ a$$
$$LnRGDPPC = \beta_0 + \beta_1 LnNIS + \beta_2 LnI + \beta_3 LnTO + \beta_4 LnM + \beta_5 t + e_t \qquad (3.1)\ b$$

Where,

RGDPPC = Real gross domestic per capita (current LCU)
CPS = credit to the private sector (% of GDP)
M = broad money supply (% of GDP)
NIS = net interest spread (lending rate-deposit rate) (%)
I = gross fixed capital formation (constant 2005 US dollars)
G = gross final consumption expenditure (constant 2005 US dollars)
TO = Trade openness
t = time trend
et = error term

VARIABLES DESCRIPTION

Gross domestic product per capita
Gross Domestic Product divided by population. GDP is the addition of value to the goods and services by country's producers along with taxes on goods in a year. Data are in current local currency.

Credit to the private sector (CPS)
Credit to private sector refers to financial means offer to the private sector by financial institutions (such as banks) through loans, purchases of non-equity securities, and trade credits and other account receivables. It is measured in percentage and expected to have a positive relationship with economic growth.

Broad money (M2)

Money supply includes currency outside banks; demand deposits, time, savings, and foreign currency deposits of resident sectors other than the central government, bank and traveler's cheques and other securities. It is measured in percentage and positive relationship is expected with economic growth.

M2 = M1 + short-term time deposit in banks and 24-hour money market funds

Financial sector efficiency

Efficiency is the capability of institutions to produce output at the lowest cost. Quantitative measures of efficiency that could be assessed contain (a) total costs of financial intermediation as a percentage of total assets and (b) interest rate spreads (lending minus deposit rates). Many researchers Saqib 2013, Koivu 2001 used interest rate spread to calculate efficiency of financial intermediaries. This study also uses interest rate spread as a proxy to compute financial sector efficiency.

Spread (NIS)

Spread also called interest rate spread is the proxy used to measure the efficiency of the financial sector; it refers to the interest rate on loans minus the interest rate on deposits. As there is a fall in spread the financial sector's efficiency increases. It is measured in percentage form and has a positive relationship with economic growth.

Net Interest Spread=lending rate–deposit rate.

Interest spread in net form may be explained as the interest yield on all the earning assets including the loan that may generate interest income deducted from the interest rates paid on the funds borrowed.

For example, a bank has average loans to customers of $100 and earns gross interest income of $7. The interest yield is $7/100 = 7\%$. A bank takes deposits from customers and pays 2% to those customers. Therefore the bank's NIS is as follows:

Net interest spread= 7%-2%= 5%.

Investment

Investment is proxied by Gross fixed capital formation which consists of terrain development (railing, waterways, exhaust system, and so on); plant, machines, and tools buying; and the building of roads, railways, and similarly opening schools, offices, hospitals, private houses, and commercial and industrial structure. Data are in constant 2005 U.S. dollars.

Government expenditure

General government final consumption expenditure is the buying of goods and services, spending on national defense and security by the government. Data were in constant 2005 U.S. dollars. Converted into Pakistani currency for estimation

Trade openness

Trade openness is the result of adding exports of goods and services (constant 2005 US$) and imports of goods and services (constant 2005 US$) divided by GDP at market prices (constant 2005 US$). Converted into Pakistani currency for estimation

ANALYTICAL FRAME WORK

Annual secondary time series data of all the variables for the period 1973-2014 are taken from world development indicators and state bank of Pakistan annual reports. For seeking of long run relationship, Pesaran et al (2001) set up a bond test for co integration called ARDL approach stands for auto regressive distributed lag approach. It is used widely by researchers such as Mahran (2012) and Umar et al (2015) to explore long run impacts of models. The benefits of this approach are as under; it can be applied to a series having a mixed order of integration.

The ARDL approach is relatively noteworthy than other methods of co integration because it is most suitable and robust for small data set (Ghatak and siddique, 2001). There is no need to test unit root in a series while using ARDL approach.

The first step before regression and estimation is to check the unit root in the data in order to avoid stationarity. In general, we can have three possible cases:

Case 1; $\{\phi\} < 1$ and therefore the series is stationary.
Case 2; $\{\phi\} > 1$ where in this case the series explodes.
Case 3; $\{\phi\} = 1$ where in this case the series contains a unit root and is non-stationary.

Generally, a non-stationary time series say Yt might need to be differenced more than once before it becomes stationary. Then, a series Yt that becomes stationary after d numbers of differences are said to be integrated of order d (Asterious and Hall 2007).

For this purpose, there are many tests that are used to check for stationarity. Augmented Dickey-Fuller (ADF) test developed by Dickey Fuller (1979), Philips-Perron (PP) test developed by Philips and Perron (1988), the next step is to determine the method suitable for achieving the stated objectives, in doing so we have to first find out the order of integration of the series under study. For this reason, the analysis applied the most popular unit root test, ADF. Initially, perform the ADF unit root test to inspect stationarity of the series of the model in Equation (3.1). As the error term is unlikely to be white noise, Dickey and Fuller extended their test procedure suggesting an augmented version of the test which includes extra lagged terms of the dependent variable in order to eliminate autocorrelation. The lag length on these extra terms is either determined by the Akaike Information Criterion (AlC) or Schwartz Bayesian Criterion (SBC) or more usefully by the lag length necessary to whiten the residuals (Asterious and Hall 2011).

The null hypothesis is that the series is non-stationary, which is tested next to the substitute hypothesis that the series is stationary.

$H_0 : \beta n \neq 0$ (non-stationary)
$H_1 : \beta n = 0$ (otherwise)

After unit root test next comes bound test for co integration. The bound test to co integration procedure is that; First convert the basic model into ARDL equation. Suppose q for the lag length of dependent variable and k for the independent variables. The ARDL form of general Equation (3.1) is written as:

$$\Delta LRGDPPC_t = \alpha + \beta t + \beta_1 LRGDPPC_{t-i} + \beta_2 LCPS_{t-i} + \beta_3 LM2_{t-i} + \beta_4 NIS_{t-i} + \beta_5 LI_{t-i} + \beta_6 LG_{t-i} + \beta_7 TO_{t-i} + \sum k_{i=3} \Delta\lambda_8 LRGDPPC_{t-i} + \sum k_{i=3} \Delta\lambda_9 LCPS_{t-i} + \sum k_{i=3} \Delta\lambda_{10} LM2_{t-i} + \sum k_{i=3} \Delta\lambda_{11} NIS_{t-i} + \sum k_{i=3} \Delta\lambda_{12} LI_{t-i} + \sum k_{i=3} \Delta\lambda_{13} LG_{t-i} + \sum k_{i=3} \Delta\lambda_{14} TO_{t-i} + U_{1t}$$
$$(3.2)$$

The parameters $\beta1, \beta2, \beta3, \beta4, \beta5, \beta6, \beta7$ are the long run parameters while $\lambda8, \lambda9, \lambda10, \lambda11, \lambda12, \lambda13, \lambda14$ are short run parameters. In the second step estimate OLS for both models and check for co integration using bound test to equation (3.2). The coefficients of lagged variables are long run parameters; now examine F-statistics for collective significance. The null and alternative hypothesis of no co integration and co integration respectively is:

$H_0 : \beta n = 0$ (co integration does not exist)

$H_1 : \beta n \neq 0$ (otherwise)

When the calculated F-statistic is greater than the upper bound value at a given significance level the null hypothesis is rejected. When F-statistic is lower than the lower bound value than the alternative hypothesis is rejected. When F-value comes in between upper and lower bounds then the result is uncertain.

When co integration exists, select lags and apply OLS to restricted ARDL model of the form to get long run parameters:

$$LRGDPPC_t = \alpha + \beta t + \sum k_{i=3} \beta 1i LRGDPPC_{t-i} + \sum k_{i=3} \beta 2i LnCPS_{t-i} + \sum k_{i=3} \beta 3i LnM2_{t-i} + \sum k_{i=3} \beta 4i NIS_{t-i} + \sum k_{i=3} \beta 5i LnI_{t-i} + \sum k_{i=3} \beta 6in LG_{t-i} + \sum k_{i=3} \beta 7i TO_{t-i} + U_t$$
$$(3.3)$$

Get an estimate of the error correction term (ECt–1), achieved from Equation (3.3) as

$$EC_{t-1} = LRGDPPC t - \alpha - \beta t - \sum q_{i=0} \lambda 1i LRGDPPC_{t-1} - \sum k1_{i=0} \lambda 2i LnCPS_{t-1} - \sum k2_{i=0} \lambda 3i NIS_{t-1} - \sum k3_{i=0} \lambda 4i LM_{t-1} - \sum k4_{i=0} \lambda 5i LnI_{t-1} - \sum k5_{i=0} \lambda 6i LnG_{t-1} - \sum k6_{i=0} \lambda 7i TO_{t-1}$$
$$(3.4)$$

Now check for a diagnostic test. RAMSAY RESET test for the functional form. One of the most commonly used tests for general misspecification is Ramsey's (1969) Regressions Specification Error Test (RESET) as with many tests this has both an F-form and an LM form. The RESET test involves including various powers of Y as proxies for X that can capture possible non-linear relationships. If one or more of the coefficients are significant then this is evidence of general misspecification. A big drawback of the RESET test is that if we reject the null hypothesis of a correct specification, this merely indicates that the equation is mis-specified in one way or another, without providing us with alternative models which are correct.

So, summing up, the RESET test can be performed step by step as follows:

Step 1: Estimate the model that we think is correct in describing the population equation, and obtain the fitted values of the dependent variable e.g Y.

Step 2: Estimate the model in step 1 again, this time including Y^2 and Y^3 as additional explanatory variables.

Step 3: The model in step 1 is the restricted model and that in step 2 is the unrestricted model. Calculate the F statistic for both models.

Step 4: Find the F-critical value from the F tables for i, n-k-i degrees of freedom.

Step 5: If F-statistic > F-critical we reject the null hypothesis of correct specification and conclude that our model is somehow mis-specified. Alternatively, we can use the p-value approach. If the p-value for the F-stat is smaller than the required level of significance (usually 0.05), then we again reject the null hypothesis.

H_0: $\beta n = 0$ (model is not correctly specified)
H_1: $\beta n \neq 0$ (otherwise)

Check the other diagnostic tests DW test for autocorrelation, Breusch Godfrey test for heteroscedasticity and Jarque-Bera test for normality.

Apply OLS to the error correction model for short-run effects of equation 3.3. The ECM model is specified as:

$$\Delta LRGDPPC_t = \alpha + \beta t + \sum_{i=3}^{q} \beta 1 \Delta LRGDPPC_{t-1} + \sum_{i=3}^{k1} \beta 2 \Delta LCPS_{t-1} + \sum_{i=3}^{k2} \beta 3 \Delta LM2_{t-1} + \sum_{i=3}^{k3} \beta 4 \Delta NIS_{t-1} + \sum_{i=3}^{k4} \beta 5 \Delta LI_{t-1} + \sum_{i=3}^{k5} \beta 6 \Delta LG_{t-1} + \sum_{i=3}^{k6} \beta 7 \Delta TO_{t-1} + \beta 8 EC_{t-1} + U_{1t} \qquad (3.5)$$

The parameters $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$, $\beta 6$, $\beta 7$ shows short run estimates while $\beta 8$ shows the coefficient of adjustment parameter. The coefficient $\beta 8$ should be significant and needs to have a minus sign. If it is so then there is convergence effect in the model in the short run, the amount of the coefficient gauge the pace of change?

EMPIRICAL RESULTS

The definition of the variables is presented in table 1as;

Table 1: Definition of the variables

Variables	Symbols	Definition
Real Gross domestic product per capita	RGDPPC	RGDPPC is GDP divided by the midyear population is the sum of gross value added by all resident producers in the economy product taxes. (current LCU).
Credit to the private sector	CPS	Credit provided by banks to the private sector (% of GDP).
Money supply	M2	Currency outside banks; deposits of resident sectors other than the central government, bank and traveler's cheques and other securities (% of GDP).
Spread	NIS	Spread = lending rates-deposit rates.
Investment	I	Gross fixed capital formation (constant 2005 US dollars).
Government expenditure	G	General gross final consumption expenditures (constant 2005 US dollars).
Trade openness	TO	Addition of Exports of goods and services and imports of goods and services divided by GDP at market prices (constant 2005 US$).

Source: World Development Indicators

The empirical results are presented step by step. The first heading includes correlation analysis secondly descriptive statistics are presented. The third heading consists of ADF test results and in fourth heading regression results are presented. Before estimating short run and long run relationships among the variables the finding of correlation among variables and finding of stationarity of the model are necessary steps to do.

Descriptive Statistics

Table 2 shows the descriptive statistics of the variables. The time period for the study is from 1973 to 2014. Data for all the variables are in original raw form.

The statistics show that at the period of investigation the average RGDPPC was 4642 billion rupees from 1973 to 2014. In 2014 the maximum value of RGDPPC was 25068 billion rupees. In the starting period of investigation, the minimum value of RGDPPC 668 billion rupees was recorded in 1973.

Table 2: Descriptive Statistics of the variables

Variables	Definition	Units of measurement	Mean	Max	Min	S.D
RGDPPC	Real Gross domestic product PC	Billion Rupees	4642	25068	668	66
CPS	Credit provided by banks to the private sector	Percent of GDP	23.49	29.78	15.80	3.39
NIS	Spread = lending rates-deposit rates	Rate	6.40	9.81	2.11	2.07
I	Gross fixed the capital formation	US dollars (million)	146	245	53	55
G	Gross final consumption expenditure	US dollars (million)	72	167	19	42
TO	Trade openness (X+M/GDPx100)	Percent	34.4	46.3	28	4
M	Money supply	Percent of GDP	44.6	58.8	33.6	5.7

CPS which is a credit to the private sector has the average value of 23.49 percent of GDP from 1973 to 2014 while it reached to the maximum value about 29.78 percent of GDP in the year 1986. It reduced to the minimum value of 15.80 percent of GDP in 2014.

Spread which is financial sector efficiency has the mean value 6.40 while its maximum ratio was 9.8 percent and its minimum ratio was 2.1 percent so at that time the average difference between the lending interest rate and the deposit interest rate was 6.4 percent.

GFCF is proxy for investment stands for gross fixed capital formation. The average investment from 1973 to 2014 worth 146 million dollars, it reached to 245 million dollars in 2008. The minimum value of the investment was 53 million dollars in 1974.

GFCE is proxy for government expenditure, stands for gross final consumption expenditure. In the table, the average government expenditure was 72 million dollars from 1973 to 2014. The maximum value recorded was 167 million dollars while in 1974 it had less value, 19 million dollars.

TO is trade openness, the average of trade openness was 34 percent in 1995. The maximum value of trade openness was 34.4 percent while the minimum value was 28 percent in 1999.

M indicates the money supply. The average money supply from 1973 to 2014 was 44 percent to the ratio of GDP. It has a minimum value of 33.6 percent to the ratio of GDP in 1974. It reached to maximum 58.8 percent to the ratio of GDP in 2007.

Unit root test results

Before analysis, the first step is to check the stationarity of the variables. If results are spurious then it is not reliable results which give specification. For this purpose, the Augmented Dickey Fuller test for unit root is used. Table 3 presents ADF test results which are applied to check for stationarity of data. RGDPPC is integrated at 1st difference its t-statistics is lower than the t-tabulated value at 5% significance level so it becomes stationary by taking the 1st difference. Our variables of concern which are financial sector efficiency (NIS) and financial intermediation (credit to the private sector) are also integrated at the 1st difference with intercept and automatic selection of lags in e views. T-statistics of NIS and CPS are both lower than t-tabulated values which are significant at a 5% significance level. So these both variables become stationary by taking the 1st difference of both indicators.

Table 3: Augmented Dicky Fuller test statistics

ADF TEST STATISTICS			
Variables	At level	At 1st difference	Results
LRGDPPC		-3.165347** (-2.938987)	I(1)
LCPS		-4.522661** (-2.936942)	I(1)
LM		-6.707262** (-2.936942)	I(1)
NIS		-5.217054** (-2.93694)	I(1)
LI	-3.926145** (-2.936942)		I(0)
LG		-4.883783** (-2.938987)	I(1)
TO		-5.748785** (-2.936942)	I(1)

** represents 5% significance level.

So, all other control variables such as trade openness and government expenditures are integrated at the 1st difference. Their t-statistics are lower than t-tabulated values at 5% significance level with intercept and automatic selection of lags in e-views 9.

Co integration Analysis

The ADF test results provided that all the variables are either integrated at the level or at 1st difference both. Now apply the bound test approach to inspect co integration among variables. The results of the bound test for cointegration are presented in table 4. The results show that computed F-statistic for both models exceeds the corresponding upper critical bound values at

5 % and 10% significance level. So the null hypothesis (of no co integration) is rejected and R2 values of both models are also high which is 95%. So there is a powerful confirmation of a non-bogus long-run relationship among the regressors and dependent variable in each model regardless of the order of integration of variables. The bound test results are consistent with the results of Mahran (2012).

Table 4: Bound test for co integration results

Test Statistic	MODEL 1		MODEL 2	
	Value	K	value	K
F-statistic	11.34476	4	4.762557	4
Critical values				
Significance	10 Bound	I1 Bound	10 Bound	I1 Bound
10%	3.03	4.06	3.03	4.06
5%	3.47	4.57	3.47	4.57
2.5%	3.89	5.07	3.89	5.07
1%	4.4	5.72	4.4	5.72
	R-squared	0.95	R-squared	0.752875
	F-statistics	31.81	F-statistics	3.584151
	Prob (F-st)	0.00000	Prob (F-st)	0.003776

Estimation of the long run and short run relationships

The estimation is done by applying the ARDL approach to cointegration to seek the long run impact of financial intermediation and efficiency on economic growth. Because in the ADF test for unit root some variable are integrated at the level and some are integrated at the 1st difference. So the suitable test to be applied is the ARDL method of cointegration. After establishing the bound test for co integration the next step is to run and estimate ARDL models for long run impact.

Table 5 reports the long run impact of the variables. In the first model, the long run impact of financial intermediation along with control variables are estimated and the second model represents the results of the long run impact of financial sector efficiency on economic growth. Here in model 1 credit to the private sector has p-value 0.0052 which is less than 5 percent significance level. Credit is highly significant and also the sign of its coefficient is positive. A one percent rise in credit leads to 0.078 percent increase in RGDPPC. There is a positive impact of financial intermediation on the economic growth of Pakistan in the long run. The outcomes are consistent with the results of Nwite et al (2014), Saqib (2013) and Ali (2013) and inconsistent with the results of Mahran (2012). This result is perhaps because of the stability of financial institutions that offer loans to the private sector. When there is more demand for goods and services, there will be more investment which leads to more GDP per capita as well as savings, together these factors lead the banks to give more credits which in turn brings high economic growth. The data also reveals that there is no big negative change occurred in rates of credit given to the private sector from the last three decades in Pakistan.

The variable government expenditure has p-value 0.01 which is highly significant and also has a positive sign. A one percent increase in government expenditure brings about a 0.06 percent increase in economic growth. So, in the long run, the positive impact of government

expenditure on economic growth exists in the study. Due to high government expenditure the public investment increases which affect economic growth positively by increasing physical and human capital formation and infrastructural investment. This result matched with the results of Mahran (2012).

Table 5. Long-run relationship an ARDL results of model 1 and 2

Variables	Coefficients	Standard errors	t-statistics	Significance level (p-value)
		MODEL1		
LCPS	0.078579	0.026166	3.003100	0.0052
LG	0.067206	0.025810	2.603884	0.0139
TO	0.040101	0.130352	0.307638	0.7604
LI	0.440590	0.239882	1.836697	0.0756
C	0.858182	0.542707	1.581298	0.1236
@TREND	0.006001	0.001336	4.490734	0.0001
		MODEL2		
NIS	-0.015482	0.005150	-3.005992	0.0051
LM	0.045254	0.099761	0.453621	0.6532
TO	0.268203	0.298363	0.898916	0.3754
LI	0.575891	0.324891	1.772566	0.0858
C	2.377381	0.297076	8.002605	0.0000
@TREND	0.011086	0.001710	6.482793	0.0000

Cointeq = LRGDPPC - (0.0786*LnCPS + 0.0672*LnG + 0.0401*LnTO + 0.4406*LnI +
0.8582 + 0.0060*@TREND   *LR-MODEL1*
Cointeq = LRGDPPC - (-0.0155LnNIS + 0.0453*LnM + 0.2682*TO + 0.5759*LI
+2.3774 + 0.0111*@TREND   *LR-MODEL2*

Trade openness is highly insignificant in both model 1 and model 2. There is no impact of trade openness on long run economic growth in the study. This may be due to not encouraging exports and other motivating incentives of trade.

The variable investment which is measured by gross fixed capital formation is significant in both of the models. In both models, it has p-values 0.08 which is significant at a 10% significance level and its sign is also positive in both models. A one percent increase in investment brings about 0.44 to 0.57 percent increase in economic growth. So there is a positive impact of investment on the economic growth of Pakistan in the long run. This outcome is consistent with the results of Ali (2013) and Mahran (2012). This positive impact of investment is perhaps due to more physical and human capital accumulation such as equipment purchases, construction of roads, railways, and hospital and educational institutions in the last decade.

The impact of financial sector efficiency is the second concern in the study. In the model no 2, the long run impact of efficiency is estimated. The sign of the coefficient NIS must be negative. When NIS is positive it indicates that efficiency is decreasing and if it is negative it shows that efficiency is increasing. The p-value of financial sector efficiency NIS is 0.0051 which is less than 5% significance level. NIS is highly significant having expected negative

sign of the coefficient. A one percent rise in efficiency brings 0.015 percent increase in economic growth. This finding is consistent with the study of Saqib (2013). NIS is the difference between lending rates and deposit rates. If the deposit rate increases NIS decreases and saving increases, it means that the bank has more money to lend and business has more opportunity to speculate which causes the growth of the economy. So in the study financial sector efficiency has a positive impact on economic growth in Pakistan.

The coefficient of time is also positive and significant in both models. With the passage of time economic growth has increased.

Table 6 reports the regression results of short-run relationships among the variables and convergence of the dynamic model to equilibrium. The indicator of financial intermediation credit to private sector CPS has p-value 0.015 which is less than 5% significance level and it's coefficient value is 0.023 and also has a positive sign. So CPS is highly significant at 5% as well as at the 10% significance level. So a one percent increase in credit to the private sector brings about 0.023 percent increase in economic growth in the short period. Credit to the private sector has a positive impact on economic growth in the short run in the study.

The control variable investment has the p-value 0.0157 which is less than 5% significance level and its coefficient value is 0.13 and has a positive sign. So I am highly significant at 5% as well as at the 10% significance level. So a one percent increase in investment level brings about a 0.13 percent increase in short-run economic growth. Government expenditure G has p-value 0.09 and coefficient value is 0.02 and has a positive sign. The p-value here is less than 10% significance level so it is significant at 10%, a one percent increase in government expenditure leads to a 0.02 percent increase in short-run economic growth. Government expenditure has positive effects on economic growth in the short run. Trade openness TO is highly insignificant so in the short run it has no impact on economic growth. A time t is significant at a 5% significance level so with the passage of time economic growth is increasing so time has a positive impact on short-run economic growth. The coefficient of the variable Co inteq (-1) in the table is negative and highly significant at 5%. Which is -0.30, it points out that the long run relationship is constant and any short run shock is impermanent and gets right over a period of time with a speed of 30 percent per year.

Table 6: Short-run results of model 1and 2

Variables	Coefficients	Standard errors	t-statistics	(p-value)
		MODEL 1		
D(LCPS)	0.023675	0.009283	2.550429	0.0157
D(LI)	0.132747	0.050300	2.639139	0.0127
D(LG)	0.020249	0.011813	1.714089	0.0962
D(TO)	-0.066235	0.043979	-1.506059	0.1419
D(@trend)	0.132747	0.000658	2.746525	0.0098
Cointeq(-1)	-0.301295	0.106395	-2.831838	0.0079
		MODEL 2		
D(NIS)	-0.000407	0.001160	-0.350416	0.7283
D(LI)	0.111449	0.046460	2.398815	0.0224
D(TO)	-0.027342	0.047290	-0.578186	0.5672
D(LM)	0.008758	0.019772	0.442943	0.6608
D(@trend)	0.002145	0.000676	3.174291	0.0033
Cointeq(-1)	-0.193524	0.065204	-2.967986	0.0056

In table 6, model 2 has variables NIS which measures financial sector efficiency, I which is investment, TO is the trade openness M is the money supply. The variable NIS is statistically insignificant while it is significant in the long run which is explained in the interpretation of long run results. In the short run, financial sector efficiency has no impact on economic growth. Investment is statistically significant with the p-value 0.02 at a 5% significance level. In model 2 there is a short run effect of investment on economic growth. The money supply and trade openness also have no short-run effects on economic growth. The time has a short-run effect on economic growth, here it is statistically significant and has a positive coefficient sign. The variable of convergence or short run adjustment is statistically significant and has a negative sign which shows that there is stable long run relationship and any short run shock will be impermanent and get corrected over a period of time with a rate of 19 percent per year.

Diagnostic tests

Table 7 reports the diagnostic tests of the estimated ARDL of model 1 and 2 respectively. Both the model passed all the diagnostic tests of Normality, serial correlation, heteroskedasticity and model specification. These are important tests to be employed in research in order to present good and reliable results. If anyone of the above test fails to give reliable results then the results we obtain from regression will be spurious and will not be able to predict or make policies from such researched study. In both models Jarque-bera test for normality has a very high p-value 0.9 which is above 0.5 indicates that residuals are normally distributed. Heteroskedasticity test Breusch-Godfrey has an insignificant value indicating the absence of heteroskedasticity problem in both models. There is no problem of autocorrelation as indicated by the DW statistics in the models, DW statistics are close to 2 which lies in between positive and negative zones of serial correlation in the Durbin Watson table indicates no serial correlation. The Ramsey reset test statistics is highly significant at 5% percent level, so models are correctly specified.

Table7: Diagnostic tests

	Normality Jarque-bera	Functional form Ramsey reset	Heteroskedasticity Breusch-Godfrey	Autocorrelation DW
MODEL 1	0.029 (0.98)	6.291648 (0.0182)	2.498262 (0.0592)	1.961670
MODEL 2	0.25 (0.88)	7.318283 (0.0126)	1.530556 (0.1773)	1.941442

CONCLUSION AND POLICY RECOMMENDATIONS

The aim of the research was to explore empirically the impact of financial intermediation and efficiency on economic growth in Pakistan from 1973 to 2014. The data used in this study is secondary and time series in nature and collected from WDI and State bank of Pakistan annual reports. Following the literature to investigate the impact of all the explanatory variables on dependent variable multiple regression models are used. To check the stationarity of the variables the ADF test for unit root is applied and on the basis of ADF test results, the ARDL method of cointegration is used to test the long run impact of financial intermediation and financial sector efficiency on economic growth.

Results of ARDL shows that indicator of financial intermediation credit to the private sector is significant in both short run and long run and is positively associated with economic growth of Pakistan. The main reason perhaps is that all financial institutions private and public both are playing significant roles in businesses. Credit to the private sector's highest value over the past 54 years was 29.79 percent to the ratio of GDP. Financial institutions provide funds to investors and investor used those funds in a proper way and run projects. If the financial sector is stable then growth is possible. So it is necessary to best allocate the surplus funds in order to conquer financial problems prevails in Pakistan. According to results, the indicator of financial sector efficiency has positively impacted economic growth in the long run while in the short run it has no impact on economic growth. And that may be because of the inefficiency of financial institutions in the short run and maybe banks do not provide funds to the investors immediately.

The results are somehow consistent with the study of Saqib (2013). As far as control variables are a concern the investment has short run and long run positive impacts on economic growth in both models. According to the results, if investment increases by one percent the economic growth increases by 0.5 percent, so the investment is playing an important role in increasing the economic growth. This finding may be attributed to ongoing projects of government as well as the private sector in the current decade. The construction sector is at a peak level, the energy sector is going to be better and also infrastructure is going to be better than in previous years. Government expenditure can have both crowdings in effects and crowding out effects. In the study, it has positive effects in the short run as well as in the long run in Pakistan. It is highly significant, especially in the long run. In the study, it has no crowding out effects. Government expenditure is now increasing more due to CPEC projects. Further, in most studies government expenditures affected economic growth positively.

Trade openness is an important variable that affected economic growth positively in most studies includes in the literature. It is an essential factor for economic growth. In the present study, it is highly insignificant and has no impact on economic growth in Pakistan. This is perhaps because of trade barriers exist in Pakistan and also due to trade deficits. It may be due to the high cost of factors of production which discourages producers and hence decreases exports. In the 70s due to recession, floods, and deindustrialization, the exports of Pakistan were very low.

The findings of the study indicate that in the last 15 years the financial structure of Pakistan has improved well, there exists more efficient allocation of resources by banks, along with the presence of appropriate investment climate necessary to increase long-run growth of the economy, and maybe the good quality of credit disbursal of the banking sector in Pakistan. Based on the findings there is need to create modern financial institutions in the banking sector and stock market for the sake of stable economic growth. Special attention should be given to liberalization of the financial sector and also especially to the liberalization of international trade in Pakistan.

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