



## HOW FINANCIAL DEVELOPMENT AFFECTS ECONOMIC GROWTH: EVIDENCE FROM SOME SAARC COUNTRIES

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**ABSTRACT:** *According to Joseph Schumpeter (1911), services provided by financial intermediaries are essential for technical innovation and economic growth. Later, empirical work by Goldsmith (1969) and McKinnon (1973) supported that there were close ties between financial and economic development for a few countries. But numerous other economists, including Robinson (1952) believed that finance was not so important for economic growth; financial development simply follows economic growth. Despite this debate, Levine (1993), among others suggests a positive relationship between financial sector development and economic growth. Moreover, there remains further debate whether the country's financial structure exerts differential impact on economic growth. Empirical studies across the countries (Rajan and Zingales, 1999) suggest that banking sector plays a key role in some countries. In this paper, I intend to investigate whether higher levels of financial development are positively correlated with economic growth using empirical evidence from five South Asian countries namely Bangladesh, India, Nepal, Pakistan and Sri Lanka. I have used Panel data analysis, Linear regression model, Levin-Lin-Chu unit root test, Covariance, Correlation and VIF test based on aggregate annual data from 1993 to 2016. My analysis suggests that development in banking sector has a moderately strong tie to promoting economic growth. The result implies that the policy should focus on banking sector development by enhancing its quality of credit products and offers to private sector as it is the main stimulator for growth in these five South Asian countries.*

**KEYWORDS:** Economic Growth, Financial Intermediaries, Financial Sector Development, Private Sector, Stimulators for Growth.

## INTRODUCTION

### Preamble of the Study

For more than 100 years, numerous researchers are testing the link between financial development and economic growth, and which factors of financial development are responsible for overall growth at which extent, differing from country to country and region to region. It all started with Schumpeter's (1911) theory on this relationship later supported by McKinnon (1973), Shaw (1973) and Levine (1997) who proved that this happens in reality with their analytical work and found out the probable responsible factors of financial development.

Levine (1993) asserted that in the context of developing countries only, economic growth is likely to have weaker ties to financial development. In this study I tried to show whether this



theory applies and to what extent in the six selected South Asian countries; Bangladesh, India, Nepal, Pakistan, Sri Lanka & Bhutan.

This chapter presents the methodology, objectives, scope and limitations of the study.

### **Objectives of the Study**

The main objective of this study is to assess what determinants of financial development has significant relationship to economic growth for the five selected countries to determine whether financial sector can be viewed as a motivator for future economic growth.

The specific objectives are as follows:

- To investigate whether the increase in credit to the private sector leads to growth in real per capita GDP,
- To investigate whether the increase of credit to private sector versus credit to public sector exerts a positive effect on economic growth,
- To determine whether the proxies of financial development affects economic growth in different directions and extents.

### **Scope of the Study**

The study analyses the link between financial development and economic growth in

Bangladesh, India, Pakistan, Sri Lanka, Bhutan & Nepal and covers the period of 1994 to 2014. The period has been chosen based on the availability of data and is sufficiently long and allows comparison with other studies.

### **Methodology of the Study:**

**Data Sources:** Both primary and secondary sources have been used to collect research data. The main sources were Website of World Bank Databank, Website of International Finance Statistics and International Monetary Fund online database. Secondary data was taken from different published research papers, journals, periodicals, newspapers etc.

**Statistical Methods:** The paper has used Levin-Lin-Chu tests to test for the existence of unit root, Panel data analysis, Fixed Effect and Random Effect Linear regression model, Covariance, Correlation, VIF test and heteroscedasticity test.

### **Limitations of the Study**

This researches' the following limitations:

**Inadequacy and inaccuracy of Data:** It was very difficult to verify the accuracy of the collected data. There were also difficulties in accessing data of some related and useful websites, non-availability of some preceding and latest data and the result of the study may not ensure complete accuracy.



**Limited Time:** There was a predetermined time limitation. It was difficult to complete the satisfactory research work within the time limit. Moreover, this short period of thesis is not enough to understand all the explanatory variables.

## CONCEPTUAL FRAMEWORK

### Defining the Indicators

I have used proxy variables to measure the level of financial development and economic growth in the five selected countries. I have used the same indicators as Levine (1993).

### *Dependent Variable*

RGDP is the dependent variable representing economic growth. It is the real per capita GDP (constant 2005 USD) of the selected countries from the years 1993 to 2016.

### *Independent Variables*

Financial systems consist of financial intermediaries, financial markets, instruments and legal and regulatory framework. Through them, information asymmetry minimized between borrowers and lenders resulting in lower cost to transfer funds. Development is seen in the financial system when all the components perform efficiently to complete these financial functions. The following proxy variables have been used in this study to represent the level of financial development:

- 1. DEPTH:** The first indicator, named DEPTH, is the representative of financial deepening, i.e. the total size of financial institutions in a country, measured as total liquid liabilities divided by GDP. Goldsmith (1969) and McKinnon (1973) believed that the larger the size of formal financial intermediation, the better the quality of the services provided by them. Here, liquid liabilities are a summation of currency held separately by the banks outside the banking system and all the deposits, both interest-bearing and non-bearing, held by the banks and NBFIs.
- 2. BANK:** The second independent variable is BANK, representing relative importance of different types of financial institutions. This also a measure of performance as commercial deposit banks is more efficient in managing risks and processing and managing investment information that lead to prudent decisions. This is calculated as the ratio of bank credit divided by bank credit plus central bank domestic assets, measuring the degree to which the central bank versus commercial banks are allocating credit.
- 3. PRIVATE:** To examine how the financial system allocates and manages credit, two more indicators are formed. The first one is PRIVATE, the ratio of credit allocated to private enterprises to total domestic credit (excluding credit to banks) and measures the level of financial services. The concept behind this indicator is that banks are usually more scrutinizing when they allocate credit to private enterprises rather than state-owned ones. Banks do more risk analyzing and monitoring on private firms and this actually leads to more efficient use of funds by the borrowers, enhancing their performance and revenue.



- 4. PRIVY:**PRIVY is the last indicator to measure financial development. It equals credit to private enterprises divided by GDP. Financial intermediaries invent new ways to efficient risk management and new financial products to enhance their services and encourage private firms to use more credit. The more the amount of funds allocated to private sector, the more likely it is that financial intermediaries will actively try to enhance their performance and also do more monitoring to make sure the funds are put in good use and the repayments are done by the borrowers accordingly.

To get better insight on how the proxy independent variables can affect economic growth a brief discussion on the functions of financial intermediaries should follow. Development in financial sector is seen when these functions are carried out efficiently. They can, in turn, accelerate the level of real per capita GDP.

#### **Functions of Financial Intermediaries:**

**Producing information and allocating capital:** To take investment decisions, firms, managers, and market conditions must be evaluated before. Individual savers may not have access to reliable information. It requires large costs and time to gather and go through all relevant information.

Financial intermediaries can improve resource allocation by minimizing the costs of obtaining and processing information, according to Boyd and Prescott (1986). Financial intermediaries like banks can analyze investment opportunities on the behalf of individuals.

Allen (1990), Bhattacharya and Pfleiderer (1985), and Ramakrishnan and Thakor (1984) also develop models where financial intermediaries gather information about firms and sell this information to savers. Rather than directly allocating debts to borrowers from savers, banks collect funds and give credit only to creditworthy borrowers. It saves time and cost of investors and eradicates lemons from the market. More credit to efficient and worthy private sectors boost economic growth in developing countries. Banks pool funds and allocate them as to the need of every individual borrower. Without a good banking system, this process is impossible to continue.

**Facilitating risk amelioration:** Diversification services provided by the financial system can affect long- run economic growth by redoing resource allocation and savings rates. Intermediaries can mitigate inter-temporal risk by investing with a long-run horizon yielding returns that are comparatively low during boom times and high in recession. An intermediary can improve risk sharing by customizing according to the agents need to consume at different points of time. Apart from that, financial markets can also transform illiquid assets into liquid liabilities. Under liquid financial markets savers or lenders can hold liquid assets like equity or bonds that can be quickly and easily converted into money when needed.

**Monitoring firms and exerting corporate governance:** Corporate governance explains to understand economic growth and the role of financial factors. The ability of capital providers to effectively monitor and to influence the use of that capital by firms has impact on both savings and allocation decisions. If shareholders and creditors can efficiently monitor firms and persuade managers to maximize firms' value, this may ensure efficient allocation of resources and encourage savers to invest more on production and innovation. However, without financial arrangements that improved corporate governance may obstruct the mobilization of savings from different agents and also may keep capital away from being invested in profitable projects



[Stiglitz and Weiss (1981)]. Hence, the proper maintenance of corporate governance techniques directly affects firm performance and economic growth rate at large.

Studies of Boyd and Prescott (1980) illustrate that capital may flow from capital scarce countries to capital abundant countries whereas the capital abundant countries have effective financial intermediaries able to exert corporate control. Therefore, poor financial intermediation will result in a sub-optimal allocation of capital.

**Pooling of Savings:** Financial systems & arrangements impact capital accumulation in three ways. First, by lowering the cost of moving funds between borrowers and lenders, financial systems reduce information and transaction costs. The lower cost of obtaining finance mobilizes consumption, investment & capital accumulation. Second, individuals and households are influenced toward long term investments. By reducing the risk of investing in potential projects financial intermediaries stimulates savings by household & individuals who may have otherwise choose to consume rather than save or invest. Third, financial intermediaries assign funds to their most productive uses & thus affect capital accumulation increasing the rate of return to saving.

**Easing Exchange:** According to Greenwood (1990), financial arrangements that lower transaction costs will foster greater specialization leading to higher productivity gains that consequently plays a role in the development of financial market. He showed that lower transaction costs does not foster the invention of new and better production technologies rather they initiate production process that are economically attractive. However, economic development & financial development are complimentary to each other. Economic environment creates incentives for the emergence of financial arrangements, and how financial arrangements stimulates economic activity.

**Lowering Information Cost:** Financial intermediaries ease information asymmetries [Schiantarelli (1995)]. The empirical evidence suggests that firms with severe information asymmetry experience more sensitivity to cash flow compared to firms with lower information costs for the outsider. For example premium borrowers enjoy lower interest rate and easier loan conditions and less collateral tied up than risky, new borrowers [Allen Berger and Gregory Udell(1995)]. Finally, stock price evidence indicates when banks sign loan agreements with borrowers, borrower-firm stock prices rise [James and Peggy Weir (1990)]. These findings are consistent with the view that the durability of bank borrower relationship is valuable. So, financial intermediaries play an important role in reducing informational asymmetries between firm insiders and outside investors that foster economic growth by ensuring more investment than countries with less effective financial systems for obtaining and processing information.

## REVIEW OF THE LITERATURE

The scholars and researchers seem to be divided upon two different dimensions of thoughts in the question of whether there is link between financial or banking sector development and economic growth. Schumpeter (1934), Goldsmith (1969), McKinnon (1973), Shaw (1973) and King and Levine (1993) conclude finance to be an integral part of economic growth whilst Robinson (1952) and Lucas (1988) thought the other class exaggerated the role of finance and decided that it is only a minor growth factor.



Barro (1991), Khan and Senhadji (2000) and Chuah and Thai (2004) further inspected the analyses done by the other scholars and concluded that some of those have several econometric problems. For ensuring the simplicity of the analyses, different economies were assumed as homogeneous so that pooled regression model could be used easily. But it was an absurd assumption to count all the countries as the same because different countries are located in different regions and therefore are subject to severe dissimilarities in their economic, financial, cultural and demographic prospect. Second, usual pooled cross-sectional analysis does not reflect time-series variation in the data; concluded by Chuah and Thai (2004). Ahmed (1998) and Ericsson et al. (2001) pointed out that if the data are averaged over long periods, the explanatory variables cannot actually explain the movement of the dependent variable. So, the conclusions drawn on those studies cannot be taken as granted.

Goldsmith (1969) came up first doing experimental studies which showed the existence of a positive relationship between financial development and GDP per capita. Greenwood and Jovanovic (1990) represent the dynamic relationship between finance and growth and point out the two-way causality between them. According to them, financial intermediaries collect, process and analyze information better than individual investors and stock markets and improve resource allocation. Greenwood (1990) said more capital for effective investments accelerates economic growth. Bencivenga and Smith (1991) emphasize the fact that, through lessening liquidity risk, banks can improve economic growth. Bencivenga and Smith (1991) further said that, financial intermediaries incite productivity, capital accumulation and growth by systematic execution and maintenance of corporate governance.

King and Levine (1993) extensively used monetary indicators which measure the size and relative importance of banking institutions along with measures of stock market development; finding a positive and critical connection between several financial development indicators and real per capita GDP growth. Levine (1993) also said that the differences in legal and accounting system across countries are a reason why the extent of the link between financial development & economic growth applies differently.

For changing European economics, Berglöf and Bolton (2002) concluded the link between financial development and economic growth is likely to be weaker during the first decade of conversion, to the least in terms of the ratio of domestic credit to GDP.

According to Fink et al. (2005), who used a sample of 33 countries (11 changing economies and 22 market economies), he found that financial development has positive growth effects in the short run rather than in the long run. Though they found that financial development related to public sector stimulates growth, development of stock market did not contribute to growth.

Kenourgios and Samitas (2007) researched using the evidence from changing economies in Central and Eastern Europe and found a positive relationship between several financial indicators and economic growth, but not for all indicators. They examined the long-run relationship between financial and banking sector development and economic growth for Poland and concluded that it is the credit to the private sector which has been one of the main driving forces of long-run growth.



## METHODOLOGY

At first, the raw data from the five selected countries have been combined into a precise panel dataset so that the data becomes useful for conducting the tests. As mentioned before, data was taken for the years from 1993 to 2016; for the countries namely Bangladesh, India, Pakistan, Sri Lanka and Nepal. First the unit root test has been conducted to test for stationarity using Levin-Lin-Chu Model. Then the variables were converted to natural logarithm numbers to eliminate the unit roots. One variable, namely Depth, needed to be eliminated from the model. Then multiple linear regression has been conducted using both the Fixed Effects and the Random Effects Model. After that, the correlation among the explanatory variables have been computed. Finally, a VIF Test to avoid multi collinearity problem and also a heteroscedasticity test have been conducted to account for the particular problem. No variable was eliminated from the model from the VIF test results, as none of them scored more than 10. If they had, the tests needed to be conducted again from multiple linear regression.

### Data Sources:

The data used in this study are a representative sample of five South Asian countries, particularly Bangladesh, India, Pakistan, Nepal and Sri Lanka over the period of 1993-2016. The data sources for this study are the IMF publication International Financial Statistics and World Bank Indicators. Other South Asian countries are excluded because of the non-availability of data & time limitation for the study. In addition, some South Asian countries faced many political and economic problems in the last years & this led to missing data for several years. Thus, the countries for which stable data was available for the required time period and all the variables were chosen so that they may represent the relationship between financial development and economic growth.

### Measuring Financial Development and Economic Growth:

I mention the proxy variables here again in a more summarized way. RGDP is the dependent variable representing economic growth. Just like Levine (1997) defined them, I am including the four proxies to measure financial development, namely: DEPTH, BANK, PRIVATE, and PRIVY, defined as follows:

1. **RGDP:** Real per capita GDP (constant 2005 USD)
2. **DEPTH:** It measures the size of financial intermediaries and equals liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial institutions) divided by GDP.
3. **BANK:** It is the ratio of bank credit divided by bank credit plus central bank domestic assets and measures the degree to which the central bank versus commercial banks are allocating credit.
4. **PRIVATE:** It is the ratio of credit allocated to private enterprises to total domestic credit (excluding credit to banks) and measures the level of financial services.
5. **PRIVY:** It equals credit to private enterprises divided by GDP.

## EMPIRICAL STUDY AND RESULTS

### Test for Stationarity

The footstep of this analysis is to determine whether the series are stationary or not. Nonstationary data are unpredictable and cannot be modeled or forecasted. Stationary data gives consistent and reliable regression outcome. Here data has been converted to their natural logarithm form to make sure that the non-stationary variable data series become stationary ones which were non-stationary at level according to the unit root test. For unit root tests for all variables, Levin-Lin-Chu test has been used as it is appropriate for panel dataset. The test assumed lag to be 1. The hypotheses of the test were:

**Null Hypothesis:** The variable Y is not stationary & has unit root.

**Alternative hypothesis:** The variable Y is stationary & has not got any unit root.

Null hypothesis was rejected if the p-value were less than 5%. Here is the summary output for the unit root test:

**Table 1: Unit Root Test**

| Variables  | Level/<br>Natural<br>Logarithm | p-value | Conclusion     |
|------------|--------------------------------|---------|----------------|
| RGDP       | Level                          | 0.2813  | Non-stationary |
| Depth      | Level                          | 0.5418  | Non-stationary |
| Bank       | Level                          | 0.0303  | Stationary     |
| Private    | Level                          | 0.2766  | Non-stationary |
| Privy      | Level                          | 0.0277  | Stationary     |
| logRGDP    | Natural Logarithm<br>form      | 0.0249  | Stationary     |
| logDepth   | Natural Logarithm<br>form      | 0.1084  | Non-stationary |
| logBank    | Natural Logarithm<br>form      | 0.0196  | Stationary     |
| logPrivate | Natural Logarithm<br>form      | 0.0227  | Stationary     |
| logPrivy   | Natural Logarithm<br>form      | 0.0002  | Stationary     |

*Source: Own calculation*

The above results conclude that RGDP, DEPTH and PRIVATE were non-stationary at level. To eliminate the unit roots from the dataset, all the variables were converted into their natural logarithm form and then the Levin-Lin-Chu test were conducted again. All other variables except DEPTH became free from unit roots and stationery. The variable DEPTH was dropped from the model as its inclusion might lead to erroneous results due to the white noise present in the particular data series.





### Test for Linearity between Variables:

When there are multiple entities for which relationships are to be predicted using the same dependent and explanatory variables and the same repeating time series, the dataset is deemed as panel data. As is the case here, for the five South Asian countries in consideration, the same variables have been used to explain the link between economic growth and financial development for the repeating time period from 1993 to 2016.

Using Pooled Regression model for panel data is wrong because it will assume all the countries to be of same characteristics; ignoring any heterogeneity and neglecting the crosssectional and time series nature of data. For panel data, either fixed effect method or random effect method should be used. Fixed effect method allows for heterogeneity by allowing to have own intercept value for different panels. Random effect model also allows for heterogeneity but demands that all intercepts for different panels have a common mean value.

Usually, Hausman testis done to determine whether to use fixed effect or random effect model. But this test is not applicable if there is any macroeconomic variable in the dataset, because it then fails to comply with the requirements of Hausman test. Here, both the models have been used and they led to almost same results.

**Random Effects Regression Model:** Here is the result of the Random Effects Regression Model for the panel data of five selected south-Asian countries:

**Table 2: Random Effects Regression Model**

|                               |          |                    |                                   |        |       |                      |
|-------------------------------|----------|--------------------|-----------------------------------|--------|-------|----------------------|
| Random-effects GLS regression |          | Number of obs      | =                                 | 120    |       |                      |
| Group variable: countrycode   |          | Number of groups   | =                                 | 5      |       |                      |
| R-sq: within                  | = 0.6621 | Obs per group: min | =                                 | 24     |       |                      |
| between                       | = 0.0626 | avg                | =                                 | 24.0   |       |                      |
| overall                       | = 0.0970 | max                | =                                 | 24     |       |                      |
| corr(u_i, X) = 0 (assumed)    |          | Wald chi2(3)       | =                                 | 201.55 |       |                      |
|                               |          | Prob > chi2        | =                                 | 0.0000 |       |                      |
| -----                         |          |                    |                                   |        |       |                      |
| logrgdp                       |          | Coef.              | Std. Err.                         | z      | P> z  | [95% Conf. Interval] |
| -----                         |          |                    |                                   |        |       |                      |
| logbank                       |          | .5876484           | .2973545                          | 1.98   | 0.048 | .0048444 1.170452    |
| logprivate                    |          | .5082294           | .0755738                          | 6.72   | 0.000 | .3601074 .6563514    |
| logprivy                      |          | .1405227           | .0802315                          | 1.75   | 0.080 | -.0167281 .2977735   |
| _cons                         |          | 1.605921           | 1.198772                          | 1.34   | 0.180 | -.7436291 3.955471   |
| -----                         |          |                    |                                   |        |       |                      |
| sigma_u                       |          | .30510185          |                                   |        |       |                      |
| sigma_e                       |          | .1735994           |                                   |        |       |                      |
| rho                           |          | .75543095          | (fraction of variance due to u_i) |        |       |                      |
| -----                         |          |                    |                                   |        |       |                      |

Source: Own Calculation

**Equation:** The equation becomes,  $\log\text{RGDP} = .5876484*(\log\text{Bank}) + .5082294*(\log\text{Private}) + .1405227*(\log\text{Privy}) + (\text{constant}) 1.605921 + \epsilon \dots \dots \dots (1)$



**Interpretation:** According to  $P > (z)$  test, BANK and PRIVATE are the significant variables to explain the change in RGDP. The result is different from what Levine (1993) has found in his research. He found that all four of the variables are significant and the coefficients are larger than those of found in this study. Here, only two of the independent variables are significant. But it conforms to the hypothesis of positive relationship between the indicators of financial development and economic growth. All the independent variables, both significant and insignificant, have positive relationship to RGDP. This goes with the conclusion drawn by Levine (1993) as he also found positive relationships for all variables.

According to R-squared numbers, variance of the dependent variable, RGDP, is explained by the regression model, 66.21% within the independent variables; 6.26% between the dependent and any one independent variable and only 9.70% by the whole model. The corresponding probability of Wald statistics is less than 5%, meaning that the coefficients are not zero. This model is okay and acceptable.

**Fixed Effects Regression Model:** Here is the result of the Fixed Effects Regression Model for the panel data of five selected south-Asian countries.

**Table 3: Fixed effect Regression Model**

|                                   |           |                    |                                   |        |          |                      |
|-----------------------------------|-----------|--------------------|-----------------------------------|--------|----------|----------------------|
| Fixed-effects (within) regression |           | Number of obs      | =                                 | 120    |          |                      |
| Group variable: countrycode       |           | Number of groups   | =                                 | 5      |          |                      |
| R-sq: within                      | = 0.6622  | Obs per group: min | =                                 | 24     |          |                      |
| between                           | = 0.0640  | avg                | =                                 | 24.0   |          |                      |
| overall                           | = 0.0951  | max                | =                                 | 24     |          |                      |
| corr(u_i, Xb)                     | = -0.1712 | F(3,112)           | =                                 | 73.18  |          |                      |
|                                   |           | Prob > F           | =                                 | 0.0000 |          |                      |
| -----                             |           |                    |                                   |        |          |                      |
| logrgdp                           |           | Coef.              | Std. Err.                         | t      | P> t     | [95% Conf. Interval] |
| -----                             |           |                    |                                   |        |          |                      |
| logbank                           |           | .6169622           | .2875097                          | 2.15   | 0.034    | .0472986 1.186626    |
| logprivate                        |           | .5011046           | .0727534                          | 6.89   | 0.000    | .3569532 .6452561    |
| logprivy                          |           | .1477194           | .0772891                          | 1.91   | 0.059    | -.0054191 .3008579   |
| _cons                             |           | 1.474603           | 1.151255                          | 1.28   | 0.203    | -.8064615 3.755667   |
| -----                             |           |                    |                                   |        |          |                      |
| sigma_u                           |           | .56149134          |                                   |        |          |                      |
| sigma_e                           |           | .1735994           |                                   |        |          |                      |
| rho                               |           | .91275061          | (fraction of variance due to u_i) |        |          |                      |
| -----                             |           |                    |                                   |        |          |                      |
| F test that all u_i=0:            |           | F(4, 112)          | =                                 | 222.94 | Prob > F | = 0.0000             |

Source: Own calculation

**Equation:** The equation becomes,  $RGDP = .6169622*(\log Bank) + .5011046*(\log Private) + .1477194*(\log Privy) + (\text{constant}) 1.474603 + \epsilon \dots \dots \dots (2)$

**Interpretation:** According to  $P > (t)$  test, BANK and PRIVATE are the significant variables to explain the change in RGDP. This result is very similar to the one found using the random effects model, so similar conclusion can be drawn for this model too.



According to R-squared numbers, variance of the dependent variable, RGDP, is explained by the regression model, 66.22% within the independent variables; 6.40% between the dependent and any one independent variable and only 9.51% by the whole model.

The corresponding probability of F-statistics is less than 5%, meaning that the coefficients are not zero. This model is okay and acceptable.

### Test for Correlation:

Correlation is a statistical measure that indicates the extent to which two or more variables fluctuate together, the values ranging from +1 to -1. Correlation cannot explain the cause behind the movements. A correlation matrix consists of correlation coefficients, which is the measure of the direction and the strength of a linear relationship among variables.

Here is the correlation matrix:

**Table 4: Correlation Matrix**

|            | <b>logRGDP</b> | <b>logBANK</b> | <b>logPRIVATE</b> | <b>logPRIVY</b> |
|------------|----------------|----------------|-------------------|-----------------|
| logRGDP    | 1.0000         | 0.1100         | 0.3673            | 0.1669          |
| logBANK    | 0.1100         | 1.0000         | 0.5563            | 0.6309          |
| logPRIVATE | 0.3673         | 0.5563         | 1.0000            | 0.7482          |
| logPRIVY   | 0.1669         | 0.6309         | 0.7482            | 1.0000          |

*Source: Own Calculation*

Apparently, PRIVATE and PRIVY have the strongest positive relationship (0.7482), followed by the strong positive relationship between BANK and PRIVY (0.6309). BANK also has a moderately strong positive relationship with PRIVATE (0.5563). With the dependent variable, RGDP, BANK has the weakest positive relationship (0.1100), which is very weak. PRIVATE has the strongest positive relationship with RGDP (0.3673), which actually falls in the category of a weak relationship. The result is different from what Levine (1993) has found, he found that all the indicators of financial growth has strong positive relationship to economic growth. Though the relationship is proved to be positive here too, they are not strong ones for each and every independent variable.

### Avoiding Multicollinearity Problem

A VIF score measures the extent of inflation in the variance of an explanatory variable. The inflation happens due to multicollinearity or the existence of correlation among the predictor variables in the model. This test is mandatory to make sure that there is no multicollinearity problem.

An independent variable 'y1' will have zero correlation with the other independent variables in the model if its VIF score is 1. The variance of 'y1', say, 'by1' will have no inflation. A VIF exceeding 10 indicates serious multicollinearity requiring the elimination of the variable from the regression model and then doing the analysis again.



Here is the VIF test result of my analysis:

**Table 5: VIF Test**

| Variable       | VIF                             | 1/VIF    |
|----------------|---------------------------------|----------|
| logPrivy       | 2.68                            | 0.373491 |
| logPrivate     | 2.33                            | 0.428406 |
| logBank        | 1.71                            | 0.585870 |
| Mean VIF       | 2.24                            |          |
| Panel Variable | Countrycode (strongly balanced) |          |
| Time Variable  | year, 1993 to 2016              |          |
| Delta          | 1 unit                          |          |

Source: (Own calculation)

As no explanatory variable scored a VIF more than 10, I need not to eliminate any of them and can accept my previous analysis.

#### Testing for Heteroscedasticity Problem:

The problem of heteroscedasticity is eliminated by converting data into natural logarithm numbers so that the predictability of the variables and the applicability of the tests remain unquestionable. The data were already converted into natural logarithm numbers to avoid having unit roots so it also freed the dataset of the problem in consideration.

Here is the result:

**Table 6: Heteroscedasticity test**

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of logrgdp

chi2(1)      =    0.11
Prob > chi2  =    0.7439
```

Source: (Own calculation)

As the p-value is more than 5%, the null hypothesis is not rejected. Constant variance means that the panels are free of heteroscedasticity.



## CONCLUSION AND RECOMMENDATIONS

### Conclusion

The study was not able to include financial deepening in the final analysis as the corresponding data was likely to lead to an erroneous result. So, its relationship to economic growth cannot be explained by this study. Though some variables have shown strong correlations between them, the final conclusion has to be drawn from the regression analysis. The regression analysis suggests that BANK and PRIVATE, representing the degree to which the central bank versus commercial banks are allocating credit and claims on the non-financial private sector to gross domestic credit (level of financial services), respectively, has a significant explanatory relationship with the growth of real per capita GDP for the selected South Asian countries.

Levine (1993) suggested in his study that, though in that study- which consisted data from 83 countries- ranging from very rich ones and very poor ones, it was proved that financial development has a strong and robust relationship with economic growth; it might not be the case for developing countries. He rather concluded that, in developing countries, this relationship is likely to be poor. The explanatory variables that he selected for his analysis might not represent the economic growth in developing countries very well.

As the selected countries namely Bangladesh, India, Nepal, Pakistan and Sri Lanka all fall in the various categories of developing countries; it is expected that one might not find a strong relationship among the variables like Levine (1993) had found. This study found the two variables representing the level of financial sophistication and the level of bank credit to private enterprises to have significant explanatory relationship with the dependent variable RGDP. For these five countries, economic growth is likely to be positively affected if the size and performance of commercial banks are enhanced and more credit is allocated to the private sector.

The findings of the research focus only on banking sector development by enhancing products and service quality along with its expansion as it better promotes economic growth compared to capital market; according to previous studies. The banking sector development does not only mean increasing the number of banks and financial institutions, but also improving their financial services and product in terms of quality as well as quantity.

### Recommendations

Banks should allocate more credit to private sectors and encourage them to use more credit through inventing suitable financial products, lowering the interest rates and monitoring how the borrowed funds are being used and guiding if necessary, so that prudent and efficient use of funds can be ensured. The latest is more appropriate in the case of small and medium sized private enterprises. Developing countries tend to have more of these rather than big industries. Abundance of needed funds and proper monitoring on the efficient use will help the small and medium sized firms to grow and will also encourage the entrepreneurs to start new businesses. So, these two variables have direct positive effect on growing real per capita GDP in the developing South-Asian countries in consideration.

The final opinion of this paper should be analyzed cautiously as the empirical analysis is based on a small sample size. What can be suggested in light of this study is that, to achieve economic growth in the South Asian developing countries, banks should continue to improve their



financial services and credit products so that private sector can be able to reach more financing, as this sector seems to be doing better than the public sector in these countries using the credit financing more efficiently.

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