BANKING SECTOR DEVELOPMENT ON ECONOMIC GROWTH: STRUCTURAL EQUATION APPROACH

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Degree of Master of Science

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Dissertation submitted in partial fulfilment of the requirements for the degree Master of Science in Business Statistics

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time during the postgraduate studies until to achieve a fruitful result and their continuous encouragement.

ABSTRACT

Banking sector development on economic growth: structural equation approach

Banking sector is an important segment of an economy. Financial and regulatory authorities have been stressing the requirements to cope with the unforeseen consequences on financial systems, banks and economic growth globally. This study explores the determinants of the banking sector development (BSD) and direct and indirect effect of the BSD on economic growth of 18 countries for the period of 2006 to 2014. As per the objectives, Two-Step System-Generalized Method of Moment (GMM) estimation used to explore the determinants of the BSD. To explore the direct and indirect effect of the BSD on economic growth, Three Stage Least Square (3SLS) estimation is used. Four indicators of the BSD, (i) bank intermediation (IM) proxied by private credit by deposit money bank to GDP, (ii) bank broad access (BA) proxied by commercial bank branches per 100,000 adults, (iii) bank profitability (PF) proxied by banks return on assets and (iv) bank liquidity (LQ) proxied by banks liquid assets to deposit were identified. Study found that BSD was determined by economic growth (EG), interest rate (IR), trade liberalization (TL), financial liberalization (FL) and governance infrastructure (GVI) explored by the first principal component of the six governance indicators. Results of the direct effect on economic growth indicates that per capita commercial bank branches have significantly influenced to the economic growth. The indirect results showed that human capital development of the selected countries has significantly cared the economic growth effects of the IM and BA out of the four models. Since, improved bank intermediation and bank access have allowed flowing credits and reliable banking facilities to the entrepreneurs and individuals for the investment on skilled labour by way of trainings and higher education opportunities which have ultimately improved the economic growth endogenously. The study suggested that governments and monetary authorities must review the policies towards the hassle-free financial access and prioritize the productive investment ventures when providing bank facilities towards the economic growth.

Key Words: Banking Sector Development, Endogenous Growth, Financial Crisis, Generalized Method of Moment and Three Stage Least Square.

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LIST OF ABBREVIATIONS

Abbreviation	Description
2SLS	Two Stage Least Square
3SLS	Three Stage Least Square
ADRL	Autoregressive-distributed lag
AFR	Average Fertility Rate
AGRP	Annual Growth of the Population
ASTEP	Average working population with Secondary and Tertiary Education Level
ATM	Automated Teller Machine
BA	Broad Access
BCBS	Basel Committee on Banking Supervision
BLAD	Bank Liquid Assets to Deposit
BROA	Banks Return on Assets
BSD	Banking Sector Development
CAR	Capital Adequacy Ratio
CBB	Commercial Bank Branches per 100,000 Adults
CC	Control of Corruption
CGI	Composite Governance Index
DMI	Democracy Index
ECC	Error Correction Code
EG	Economic Growth
EIU	Economist Intelligence Unit
EU	European Union
FDI	Foreign Direct Investment

FE	Fixed Effect
FSI	Financial Soundness Indicators
FSI	Financial Stability Institute
GCE	Government Consumption Expenditure
GDP	Gross Domestic Product
GE	Government Effectiveness
GFCF	Gross Fixed Capital Formation
GFDD	Global Financial Development Database
GMM	Generalized Method of Moment
GI	Governance Infrastructure
HC	Human Capital
HHI	Herfindahl-Hirschman Index
IFC	International Financial Corporation
IFR	Inflation Rate
IM	Intermediation
IMF	International Monetary Fund
II	Initial Income
IV-GLS	Instrumental Variable-Generalized Least Squares
LQ	Liquidity
MEME	Manufacturing Export share on Merchandise Exports
MENA	Middle East and North America
MSME	Micro, Small and Medium Enterprises
NGVI	New Governance Indicator
NRR	Natural Resources Rent
OECD	Economic Co-operation and Development

OLS	Ordinary Least Square
PA	Political Stability and Absence of violence
PAG	Population Aging
PCA	Principal Component Analysis
PCDMB	Private Credit by Deposit Money Bank to GDP
PEE	Primary Education Enrolment in Population
PF	Profitability
PELF	Primary Education Level in Labour Force
PGDP	Per capita Gross Domestic Products
PI	Physical Investment
POLS	Pooled Ordinary Least Square
R&D	Research and Development
RE	Random Effect
RGDPG	Real Gross Domestic Product Growth
RI	Reform Index
RIR	Real Interest Rate
RL	Rule of Law
ROL	Rule of Law
RQ	Regulatory Quality
SEM	Structural Equation Method
SUR	Seemingly Unrelated Regression
TC	Technology
TFP	Total Factor Productivity
TO	Trade Openness
TOT	Trade of Terms

USD	United States Dollars
VA	Voice and Accountability
WB	World Bank
WBG	World Bank Group
WDI	World Bank Development Indicators
WGI	Worldwide Governance Indicators
WITS	World Integrated Trade Solution

LIST OF APPENDICES

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

A banking sector is an integral and important element of an economy. Banks are recognized as the dominant intermediation in a financial system by way of taking funds from depositors and lend them out to potential borrowers. An efficient banking system in a country highly facilitates to exchange of goods and services providing incentives for savings and proper channelling of productive investments to spur the economic growth. World Bank (WB) (2017) defines that economic growth as a long-term expansion of the productive potential of the economy and compare to economic development which is a phenomenon of market productivity and rise in Gross Domestic Product (GDP).

The concepts of banks and banking sector in a financial sector became the central theme for many scholars and academics to explore the behaviour of banking sector development (BSD) in the economy since long before. Hence, large number of theories and empirical studies of the financial sector, banking sector and economic growth have been largely emerged globally. Financial and regulatory authorities in respective governments have been stressing the requirements to cope with the unforeseen consequences on financial systems, banks and economic growth for cross countries and individual economies. Schumpeter (1911) introduced the idea of productivity and growth of an economy is affected by the services of the developed financial sector which has caused to develop the huge amount of theoretical and empirical findings. The initial debate was whether financial sector played an important role for the economic growth or financial intermediaries originated from the industrialization (Gerschenkron, 1962; Patrick, 1966; and Goldsmith, 1969). For that reason, the consequences of BSD are vital and foremost to explore.

1.2 Banking Sector Development Indicators

Banks play an exceptional role as a middle man which mechanizes diverse functions of the financial system. Thus, it is important to appraise the performance of the banking sector out of which role and mechanism in the financial sector. Singh (2009) mentioned core activities of a bank for the development of an economy as promote saving habits, capital formation and promote industry, smoothing of trade and commerce functions, generate employment opportunities, support agricultural and industrial development, applying of monetary policies and balanced development. Since, banks' role of the intermediation in the financial sector is essential to explore.

Levine (1997) viewed that there are five basic functions of a financial system by which facilitation of risk management, allocation of resources, monitoring of managers and control over corporate governance, savings mobilization and easing the exchange of goods and services. Hence, the indicators of the banking sector development must stand for its diverse roles and functions in an economy or an industry. Inability to connect the theories and empirics is a huge drawback in many previous studies due to the data limitation and using of conventional indicators of the banking sector development (BSD). Since the lack of proxies to represent the banking sector development, while theories focus on one dimension, empirics have focused on another dimension. Therefore, the role of banking sector in determining the economic growth has exaggerated.

The other problem found in the previous studies is that the unavailability of data for most under developed countries was excluded from the sample and its inclusion probably changes the final results. Therefore, the selection of countries for the studies has biased to developed segment. On the other hand, some researchers suggested and tested the finance and growth nexus using proxies on finance quality rather than quantity measures. To overcome this inconsistency, Badun (2009) suggested that future research should focus on the efficiency of the financial intermediation, rather than on financial deepening. Standard proxies for financial intermediation could be enhanced with other variables in order to add dynamics into the relationship between finance and growth.

The indicators of the BSD have been defined based on the financial sector by the World Bank (2006) under the four dimensions and which are the depth, access, efficiency and stability. The World Bank identification is based on many empirical findings through different scholars and time scales in global context. However, the indicators of the efficiency and access dimensions have become the emerging trends to measure the banking sector performances in recent time. Traditionally, indicators on depth and stability have been used to explore from the indicators of the financial sector development (FSD) through bank intermediation due to the vast available information (King & Levine, 1993; Odedokun, 1996; and Levine, 1997). Thus, it is appropriate to incorporate a measure of efficiency of the banking sector in financial intermediation. On the other hand, financial soundness is a key for financial stability and monitoring the soundness of financial institutions which will help to detect any possible buildup of systematic risk that may lead to a crisis. For this reason, the financial soundness indicators (FSI) were developed (Asian Development Bank, 2015).

According to the World Bank (2017), the Private Credit to Deposit Money Bank to Gross Domestic Product (PCDMB) for the bank intermediation, Commercial Bank Branches per 100,000 adults (CBB) for the bank broad access, Banks Return on Assets (BROA) for the bank profitability and Banks Liquid Assets to Deposit (BLAD) for the bank liquidity are used in most recent studies as proxies in spite of conventional indicators of the BSD. Therefore, the above-mentioned proxies will use to build the research models of the indicators of the BSD which represent the developed and developing nations in this study and cover all four indicators which are not commonly seen in previous studies.

The following Figures 1.1 and 1.2 show that the behavior of such proxy variables in global scenario. Since, PCDMB, BROA and BLAD are illustrated in the Figure 1.1.

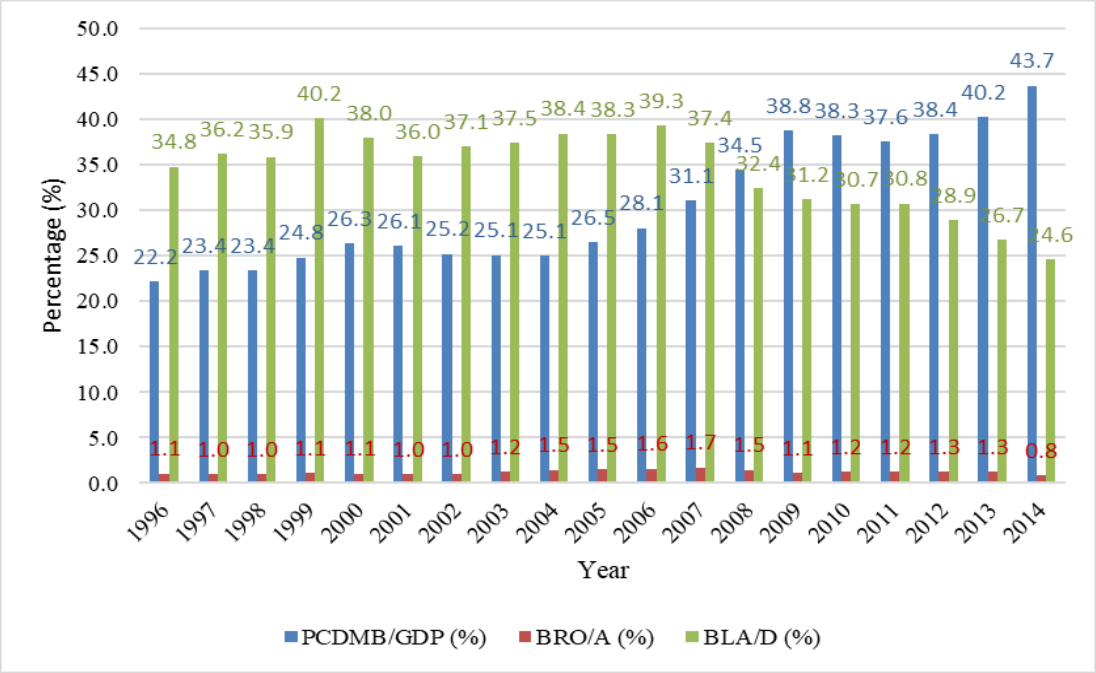

Figure 1.1: PCDMB, BROA and BLAD in Global Context

Source: International Monetary Fund (2016)

Above figure indicates that the PCDBM has increased consecutively during the period of 1996 to 2014. However, BLAD has decreased consecutively from 2007 while BROA was taken moreover a same figure while recording a lower figure in 2014 compared to the other years globally.

On the other hand, Figure 1.2. presents the CBB per 100,000 adults. The figure shows an upward trend during the years 2001 to 2014 globally. However, it has recorded around 16 number of commercial bank branches to 100,000 adults in global scenario.

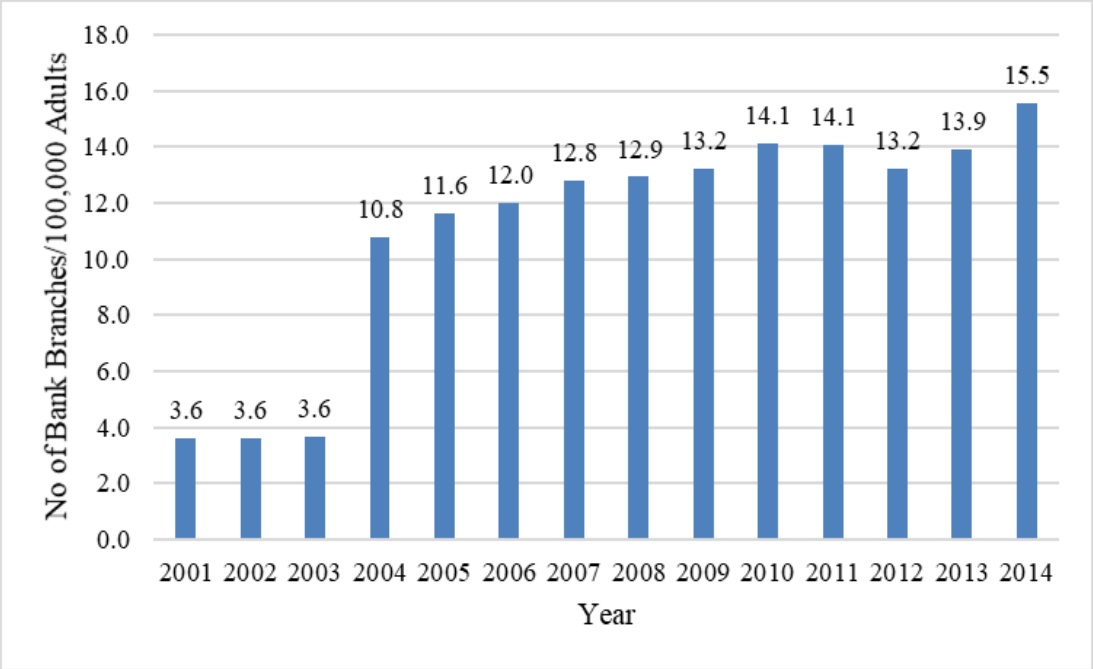

Figure 1.2: CBB in Global Context

Source: International Monetary Fund (2016)

1.3 Determinants of the Banking Sector Development and Cross-Country Analysis

The existing studies showed that individual countries should thoroughly pursue the domestic financial market through the institutions regardless of its size to the domestic economy to achieve faster growth. Thus, the development of the banking sector and its services are characterized by increasing returns to scale and cross boarder integration of financial markets may be one of the major sources for the development and efficiency gain (De Serres, Blanco & Fernandez-Bustillo 2006). On the other hand, macroeconomic factors on banking sector development are severely influenced and shaped by the international phenomenon of current economic policies and reliefs of cross country trade and monitory policies. Thus, this circumstance

highly demands to make a study on the cross-country behaviors of the banking sector development and its impact on economic growth.

The importance of the development of the banking sector towards the economic growth has been empirically proved; scholars are extensively involving to explore the factors that impact on BSD. As per the previous studies, parallel to theoretical assumptions, diverse range of factors have been explored. The other influence is that the determinants of the banking sector not behaved alone in a macroeconomic environment which is shaped by the cross-border influences. It again justifies the study on cross country behavior of the banking sector development, because most of the prevailing studies have been done relevant to individual economies.

McKinnon (1973) and Shaw (1973) highlighted the positive relationship between financial development and the level of output in which credit intermediation in financial market has promoted investment and improved the level of output. Furthermore, positive real interest rate (RIR) promotes financial development through enhancement of savings in a society stimulating the growth through the increase of productivity of the capital. Yu and Gan (2010) examined the determinants of the BSD in Malaysia testing the variables of perspectives of real income by real gross domestic product (RGDP), RIR, trade openness (TO) to GDP and financial liberalization (FL) index initially constructed by Kaminsky and Schmukler (2002). Then, the real GDP per capita growth, remittances received and Inflation have found as macroeconomic variables with stock market capitalization as a proxy to capital market development in the studies of BSD. When determine the development of BSD, RGDPG, RIR, FL, TO and governance infrastructure (GI) have been instrumented by the Kaufmann, Kraay and Mastruzzi (2011), found that influences were in different levels.

It is evidenced that effects of the variables on BSD cannot be measured only in the local environment. Removing restrictions for the finance access among globally by the open economic policies have influenced a local economy in diverse manner. Since, it is important to explore the behavior of the BSD and its changes in local and

international environment. Scholars have done studies on financial sector and banking sector based on the cross-country studies including emerging countries, developed countries and developing countries in relevant to different region of the world.

Though there are many inconsistent results found on the impact, nature and direction of the relationship between determinates and BSD. Badun (2009) mentioned one more obvious problem in his reviewed papers that almost everybody ignores the dark side of finance, i.e. the financial crisis, which can also have an effect on the economic growth. Since, during the period of 2007 to 2010, the global financial crisis happened and which has brought many consequences to global financial industry as well as to global economies. Since, it is worthwhile to perform a cross country analysis to explore the reliable results of the BSD and its economic consequences.

1.4 Financial Intermediation and Endogenous Growth

Although the neo-classical models emphasized that economic growth is determined by the rise of the labour, capital and technical development explained the economic growth in a different manner, the endogenous growth models considered the technology development as an endogenous factor which generate within the economy.

According to the prevailing findings on the studies of finance and growth nexus, Solow (1956) believed that financial development effect on economic growth through level and efficiency of capital formation in short term. However, Schumpeter (1911) highlighted that the appropriateness of the endogenous growth model to explain the interconnection between innovation and financial consequences. Under this background, endogenous growth theories have highlighted that internal consistency would be able to clarify the differences in the level of economic development and dissimilarities in growth rates of the countries. Furthermore, elimination of government restrictions on banking sector gave rise to increase the quality and quantity of investment and financial development as a strategy for

economic growth (McKinnon, 1973). In modern studies, Levine (1997) emphasised a better framework regarding on the role of financial intermediaries, since he believed that financial intermediaries are able to increase the economic growth through capital accumulation and technological innovations. As per the theoretical findings, BSD leads to create a positive effect on investment.

Romer (1986) and Lucas (1988) introduced the technological changes to the production function as an endogenous factor. The new growth theory stressed that economic growth improve due to the increasing returns of investment by the use of knowledge rather than labor and capital. Concurrently, endogenous economic growth model has validated its effect on three ways. First, it can increase the productivity of investments. Second, when an efficient financial sector reduces transaction costs, it increases the share of savings channeled into productive investments. Third, financial sector development can either promote or decline savings (Pagano, 1993). Greenwood and Jovanovic (1990) said in which both the extent of financial intermediation and the rate of economic growth are endogenously determined.

Furthermore, it can be hypothesized that human capital is affected by BSD, since, banking activities lead to enhance the human capital of a country through increased competition, learning by doing, know-how and reverse engineering processes. Thus, model of economic growth is found that increased human capital would positively affect the economic growth (Barro, 1991). According to the study of Bencivenga and Smith (1991) prior to the introduction of finance intermediation, agent who faced random liquidity requirement on unproductive assets was improved due to bank intermediation towards saving shift to capital composition and growth promoted.

When take action to develop the banking sector, it would lead to develop human capital, improve technology, and increase physical investment. However, evidences showed that global economic downturns and crisis is becoming a common enemy which has brought many more challenges for the human lives. Fitch Rating shows that the insufficient capitalization as a significant issue to the banking sector, stemming from thin capitalization across state banks and diminishing capitalization

across most non-state banks. Furthermore, it draws attention that higher credit risk due to lack of loss absorption buffer, rate hikes and higher reserve requirements to curb credit expansion and inflation pressures have led to create negative rating action. Alternatively, pressure on bank credit profiles through an increase in risk appetite has become another reason for the negative ratings (Colombopage, 2016).

1.5 Banking Sector Development and Economic Growth

Scholars have studied about certain consequences on economic growth by financial development intermediation and banking sector under different dimensions. Furthermore, causality and non-linearity were the most highlighted out of them. It is important to bring up thoughts of three different schools who have argued that whether financial sector development leads economic growth or vice versa. Initially, the supply-leading group argued that well developed financial system plays an important role in increasing productivity and economic growth. Awdeh (2012) supported that view and argued that efficient financial system plays an important role in helping a nation's economy to grow, and well-functioning banks spur technological innovation offering funds to entrepreneurs who successfully implement innovative products and production processes which stimulate future growth (Goldsmith, 1969; McKinnon, 1973; and King & Levine, 1993).

The opposite view is that demand-following hypothesis, Robinson (1952) has found that economic growth creates the demand for financial instrument and enterprises lead to finance follows, therefore the relationship has started from growth to finance. It is claimed that financial development helps to identify better investment opportunities, reduces productive cost, mobilizes savings, boosts technological innovation and enhances the risk-taking capacity of investors (Levine, 1997). Dematriades and Hussein (1996), Zang and Kim (2007) and Odhiambo (2008) also argued that when the real output of the economy goes up, it requires greater amount of financial services. Since, a growing economy will demand a financial system which is larger and more efficient.

The third school of thought discussed about a bi-directional relationship between financial development and economic growth. Mhadhbi (2014), Lucas (1988), Deidda and Fattouh (2001) and Rachdi and Mbarek (2011) have supported for this bi-directional idea in their studies. While some scholars found bi-directional causality between finance developments and economic growth, some dismissed the idea of financial development as key determinants of economic growth. They found no significant relationship between the variables. Since, to explore such results, different schools of thoughts basically focused different econometric models in terms of dynamic panel analysis, time series analysis, panel data co-integration, standard regression and granger causality tests.

Based on the multiple theoretical models, scholars have carried out the vast number of studies to explore the relationship between finance development and banking sector with economic growth. They have given more attention to nonlinearities as well as heterogeneities including transition economies in this field of research. Beck, Demirgüc-Kunt, Laeven and Levine (2008) point out that this differentiation is very important. According to their findings, it is bank lending to enterprises and not to households that drives the positive impact of financial development on economic growth. Empirical research does not give clear answers on the importance of financial intermediation by banks for economic growth. According to the finding of Deidda and Fattouh (2001), low income countries showed significant relationship between financial development to growth while high income countries showed positive and strongly significant relationship.

In other words, financial development is not associated with higher growth rates at all levels of economic development. However, in the study of Valverde, Del Paso and Fernandez (2004), they separated the countries in to three groups and results found that in countries with low financial developed market with additional improvements did not show a clear effect on growth but depending on the financial indicators used it was either positive or non-existent. The econometric model was commonly used in these studies were the Generalized Method of Moment, Threshold Regression, dynamic panel analysis and general regression. Furthermore, Henderson,

Tanner and Strachan (2008) pointed out that failure to account for nonlinearities, variable interactions, and parameter heterogeneity could lead to gross misconceptions about what is really going on. If one ignores nonlinearities, policy recommendations based off a specific growth theory may not offer the correct prescription.

1.6 Importance of Econometric Models

Badun (2009) viewed that scholars have defined the financial and economic growth in wrong way. If finance matters for growth, why do some countries have financial systems that spur economic growth, and the other do not? It is important to find out when and under what circumstances does a banking sector have a positive influence on economic growth and what determines its efficiency in this context? Instead of exploring the causality issues, biased on other empirical findings, choosing between the short run and the long run, a different approach is needed. Structural Equation modeling (SEM) often used to assess influences of unobservable variables and this would measure the model defines unobserved variables using observed variables. This link involves constructing of a structural equation model estimated with independent regression equation through more involved approaches.

SEM commonly justifies in the social science studies, because its ability to establish the relationship between hidden variables from observed variables. Thus, in the studies of banking sector development on economic growth, there are diverse ranges of unobserved variables due to different scenarios. Generalized Method of Moment is employed to construct the relationship between banking sector and economic growth for consistency as mentioned by the Levine, Loayza and Beck (2000), to deal with key problems of omitted variable bias and simultaneity bias plaguing past studies of the link between financial development and economic growth. Arellano and Bover (1995) and Blundell and Bond (2000) mentioned that GMM accounts for the endogeneity and it uses an instrument lagged values of the dependant variables in level and in differences because lagged values of other regressors potentially suffer from endogeneity. The Three Stage Least Square (3SLS) estimation introduced by Zellner and Theil (1962) combined the properties of two-stage least squares (2SLS)

and seemingly unrelated regression (SUR) estimators. Because the possible parameter biasness is a major concern in the above structural model as several endogenous variables appear in the right-hand side of the structural model.

Exploring the relationship and impact of the BSD on EG, is important requirement for policy makers to make decisions and find further solutions for the problems in the economies. Many empirical studied done on financial sector development and economic growth using data for individual economies and cross-countries, the finding were still polarized. The role of financial factors in economic growth is overemphasized (Lucas, 1988). Since, the performance of the economies of countries and consequences is diverse nature. On other hand, bankruptcy of some economies has brought huge impact to the global financial system including banking system also. Thus, the impact of the BSD on economy of a country is more important area to be critically studied. In this context, findings of this study would create a pave to explore further unobserved consequences of the BSD in relation to the EG which bring a light to see the solution for the matters of finance in the individual countries.

1.7 Research Problem

The huge number of empirical studies done in previous two decades to explore the banking sector development on the economic growth and it is still a vague answer for the following questions (Lucas, 1988). Is there an effect of banking sector development on economic growth? Is it a direct or indirect? If it is indirect, what channels it would make the impact? Especially the endogenous economic growth gives a special intention in modern day to explore the BSD on EG. In estimating the banking sector and growth nexus, the explored results and findings of the different scholars are still contradictory.

Since, banking sector itself can become a risk for the overall finance sector and to the economy. Bank can create vulnerabilities of systematic nature, partly due to a mismatch in maturity of assets and liabilities and their interconnectedness. Thus, soundness of the banking system is important to contribute towards maintain the confidence in a financial system. If it fails, the potential impact spread to all

activities in financial and non-financial entities finally to whole economy (Central Bank of Sri Lanka (CBSL, 2017).

While supply leading hypothesis is supported that well developed financial system plays an important role in increasing productivity and economic growth (Goldsmith, 1969; McKinnon, 1973; and Levine *et al.*, 2000), demand following hypothesis is evidenced that when the real output of the economy goes up, it requires greater amount of financial services. Since, a growing economy will demand a financial system which is larger and more efficient (Zang & Kim, 2007; and Odhiambo, 2008). However, the bi-directional idea has been established by the studies of Wood (1993) and supported the idea of financial development as key determinants of economic growth. They found no significant relationship between the variables (Akinboade, 1998); Luintel & Khan, 1999; and Lucas, 1988). These scholars found no significant relationship between the variables.

The findings of different schools of thoughts are basically focused in terms of econometric methodology, paying more attention to nonlinearities as well as heterogeneities, and including transition economies in this field of research. Henderson, Tanner and Strachan (2009) pointed out that failure to account for nonlinearities, variable interactions, and parameter heterogeneity could lead to gross misconceptions about what is really going on. If one ignores nonlinearities, policy recommendations based off a specific growth theory may not offer the correct prescription.

Endogenous economic growth literature brought a new perspective to the banking and growth, based on the empirical and theoretical findings of the many scholars. Solow (1956) viewed the exogenous growth based on neoclassical economic theories while other scholars depicted that banking activities lead to enhance the human capital of a country through increased competition, learning by doing, know-how and reverse engineering processes. Since, economic growth model found that increase human capital would positively affect the economic growth (Romer, 1990; and Barro, 1991). Bencivenga and Smith (1991) claimed that prior to introduction of

finance intermediation; agent who faced random liquidity requirement on unproductive assets was improved due to bank intermediation towards saving shift to capital composition and growth promoted. Initiates to develop the banking sector which lead to develop human capital, improve technology, and increase physical investment.

It is important to find out when and under what circumstances does a development of the banking sector have a positive influence on economic growth and what determines its efficiency in this context? Instead of exploring the causality issue, biasness of other empirical findings, choosing between the short run and the long run, a different approach is needed. Thus, these all types of perspective show a huge gap still available in the studies of banking sector development and economic growth. Hence it is timely matter to investigate the effect of the BSD on EG.

1.8 Research Objectives

As emphasized above, the objectives of the study are:

- To investigate the determinants of banking sector development
- To measure the direct effect of banking sector development on economic growth
- To measure the indirect effect of banking sector development on economic growth

1.9 Significance of the Study

The results of this study can be used for the development and policy implications of the BSD towards the EG. Further, results are useful for different states to the Central Banks, bankers, researchers and national policy makers, economists and investors. On the other hand, researchers and scholars in South Asian Region and other countries would be able to use this finding to explore the answers for different consequences which have been aroused in recent time and to overcome the future matters.

The investors and economist collect more empirical findings to make sure on their decisions on behavior of the banking sector and economic growth of the countries. Therefore, they would be able to make precise decision using reliable information and real scenarios out of this study. When they identify the relationship between BSD and EG based on causality and non-linearity, it would aggregate further valuable findings for the literature. Further, they would be able to make clarify their results more correctly based on the results of this study.

Furthermore, this study would be an example for the proper selection of econometric models which has overcome the issues in traditional panel estimation methods, since traditional panel methods would be biased and inconsistent, because the lagged effect of the dependant variable is correlated with the error term. Furthermore, the endogeneity in the right-hand side regresses and resulting estimate bias would be a major issue. Another problem is the unobservable heterogeneity across the banks in different nations. Therefore, the econometric models of Dynamic panel and Structural Equation Approaches used in this study provide the better examples for the similar studies in finance field.

1.10 Chapter Organization

The overall study is presented throughout the six chapters. The chapter one presents the introduction of the study giving an overview of the overall study to make clear the flow of the study for the reader.

The chapter two is confined by the literature review. The review of theories on finance and economic growth is initially illustrated. Then the huge number of empirical findings are reviewed in relation to the banking sector development, indicators and diverse nature of relationship between BSD and EG.

Next the chapter three is illustrated by the methods and materials of the study. The chapter describes the data sources and variable selected in light of the literature review. Then statistical methods and econometrics methods, Generalized Method of Moment and Three Stage Least Square used for this study are discussed in this chapter.

Chapter four depicts the explanatory data analysis and correlation analysis. The overall presentation of this chapter provides a comprehensive idea of the variable selected and its relationship.

The chapter five presents the core analysis of the study under the objectives of determinants of the banking sector development, direct and indirect effect of the banking sector development on economic growth.

Finally, chapter six presents the conclusion, recommendations, and suggestions for the policy implication based on overall results found in the study.

CHAPTER TWO
LITREATURE REVIEW

2.1 Introduction

The topic on financial sector development on economic growth has been one of a most heavily researched area. Scholars have stressed the role of financial intermediation by the banks in numerous literatures. Financial intermediaries and banks may vigorously seek out and attracts reservoirs of idle funds which will be allocated to entrepreneurs for investment in projects with a high rate of social return or they may listlessly exploit their quasi-monopolistic position and fritter away investment possibilities with unproductive loans (Cameron, 1972).

Banking sector development has been reviewed in most empirical studies under the financial sector development and financial intermediation. Endogenous growth theory is critically evaluated in regards to the banking sector development in this study. Growth theory illuminates many of the channels through which the emergence of financial instruments, financial markets and institutions affect or are affected by economic development (Levine, 2005). Therefore, in this chapter past empirical findings related to (i) determinants of the banking sector development and (ii) direct and indirect effect of banking sector development on economic growth are critically reviewed.

2.2 Theoretical Review

The theoretical review section is covered by the theories on finance and endogenous growth model. Initially the review is arranged to explain the indicators of the banking sector development. Then the evolution of the theories on finance and its development towards the banking sector development is discussed. In here, the determinants of the banking sector are highlighted throughout the evolution of finance. Then, the endogenous growth theory presents its evolution from the neoclassical growth theory to endogenous growth. The theoretical evolution of the bank-based system is discussed from the financial development. Therefore, hypothesized link between finance and growth would make clear to find a better path on banking sector development.

2.2.1 Banks and Banking Sector

Financial development represented by the banking sector is a central area for the economists and researchers to expand the studies on finance and growth nexus. A financial intermediary is an institution that serves as a middleman for diverse parties in financial contracts. According to the neoclassical and mainstream economics, a bank is considered as a financial intermediary who accepts deposit and use funds to distribute loans. When considering the Global banking industry, it has become more complex than ever due to the various reasons and to align with the pace of economic conditions in the world.

In reality, no one can become an Island today. In the beginning of the 21st century, the biggest banks in the industrial economies have become remarkable organizations that offer a wide variety of services to international markets and control billions of dollars in cash and assets. Supported by the latest technology, banks are working to identify new business niches, to develop customized services, to implement innovative strategies and to capture new market opportunities. Further, globalization, consolidation, deregulation, and diversification of the financial markets in the world has made the banking sector even more diverse (International Institute for Sustainable Development [IISD], 2017).

A bank acts as an intermediary between savers and persons who are able and willing to borrow money. This relationship is often described as that of savers and investors, but the borrower is not obliged to invest, in the sense of obtaining new capital goods (Cameron, 1972). Business Dictionary (2017) defines the bank as an establishment authorized by a government to accept deposits, pay interest, clear checks, make loans, act as an intermediary in financial transactions, and provide other financial services to its customers. Thus intermediaries, banks may vigorously seek out and attract reservoirs of idle funds which will be allocated to entrepreneurs for investment in projects with a high rate of social return; or they may listlessly exploit their quasi-monopolistic position and fritter away investment possibilities with unproductive loans (Cameron, 1972) and assumed that in both cases financial intermediation might have certain consequences on economic growth.

When concern the range of services offer and operations of banks, the scope of the banks becomes more important than ever. In addition to that the financial intermediation for offer loans, deposits and payment services, brokerage services and assets securitization becomes major tasks of the banks in current environment. Banks often act today as financial intermediaries between other financial intermediaries and for the ultimate borrowers or lenders. Therefore the role of the banks as financial intermediaries plays a significant role in most of the economies. Banks are expected to behave to fulfill the requirements of promoting capital formation, invest in new enterprises, promote the trade and industry, develop the agriculture, make balanced development on the different region, influence economic activities, implement the monetary policy, monetize the economy and export promotion to develop the economy in a broad scope.

Scholars have discussed about the finance-growth nexus in favor of and different perspectives. Cameron (1972) depicted more important four points were derived from banks and financial system. He emphasized first: banks role of a financial system as intermediation to serve as a vehicle for channeling small funds from savers to investors towards increment of funds later, second: financial intermediation provide incentives to investors encouraging for larger investment under a declining cost of borrowing, third: creating more possibilities for efficient allocation of resources and fourth: as a role of the bank in promoting technological progress thus technical innovation were introduced by firms with access to bank financing.

2.3 Indicators for the Banking Sector Development

World Bank's Global Financial Development Database (GFDD) developed an internal and comprehensive yet relatively simple framework to measure financial development worldwide. This framework identifies four sets of dimension characterizing a well-functioning financial system: financial depth, access, efficiency, and stability. WB classified the indicators of the banking sector development based on the finance sector development for the financial institutions which are given in Table 2.1. According to the four dimensions prescribed, there are

different indicators to represents the each dimensions and each indicator are measured through different proxies.

Table 2.1: Financial Sector Indicators for Banking Sector Development

Dimension	Indicators	Proxy Variables
Depth	Size	-Deposits money bank assets to GDP -Central Bank assets to GDP -M2 to GDP -Deposit to GDP
	Intermediation	-Private credit to GDP -Private credit to total credit -Private credit to total deposit
Access	Broad access	-Branch and ATM density -Average loan and deposit size -Loan and deposit account per capita
	Household access	% of people with bank account
	Firm access	-Collateral need for bank % of firms with financing constraints
Efficiency	Profitability	-Return on assets -Net interest margin
	Efficiency	-Operating cost -Lending spread -Days to clear check
	Competitiveness	-Concentration ratio -Ownership
Stability	Capital adequacy	-Capital adequacy ratio
	Assets quality	(a)Lenders -Non-performing loans -Real credit growth -Loan concentration -Large loan exposure to capital (b)Borrowers -Firm leverage -Interest coverage ratio -Household debt to GDP
	Liquidity	-Liquidity assets ratio

Source: World Bank Group (2006)

2.3.1 Depth Dimension

Financial depth captures the financial sector relative to the economy. It is the size of banks, other financial institutions, and financial markets in a country which taken together and compared to a measure of economic output (WB, 2017). However, the depth is measured by two main indicators as size and intermediation of the finance

sector. As per the World Bank definitions, some of the proxy variables are used to identify the size of the banking sector.

The first indicator is the ratio of deposits money bank assets to GDP which is comprised with the commercial banks and other financial institutions that accept transferable deposits, such as demand deposits and assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector (International Bank for Reconstruction and Development [IBRD], 2015). Central bank assets to GDP are defined as the domestic real nonfinancial sector by the Central Bank as a share of GDP. When considering the liability side of the balance sheet of the banks, a measure can be done on the absolute size of the banks. Broad Money (M2) to GDP is the next indicator. American scholar Mackinnon first proposed this ratio in the 1970's (Marksixlottery. Wordpress, 2013). Under this dimension, ratio of deposit to GDP is the other variable which is defined as the demand, time and saving deposits in deposit money banks as a share of GDP.

The next indicator of the depth dimension is that the intermediation. When measuring the size of the banking sector using financial intermediaries, it would not measure whether financial intermediaries are private or public. Because channeling savings to investors are an important mechanism in an economy done by the banks, thus it is defined as a form of capital transportation. The institutions that stand between savers and borrowers are known as financial intermediaries. The most common financial intermediary is the bank, so the study of intermediation is sometimes also known as banking.

To measure these indicators, there are three recommended proxies by the WB (2006). Ratio of private credit to GDP is a most important and widely used indicator and which is the domestic credit to private sector by banks. This refers to financial resources provided to the private sector by other depository corporations, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable, that establishes a claim for repayment. The ratio of private credit to total

credit is defined as the private credit to domestic sector. This refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable that establish a claim for repayment. In some countries, these claims include credit to public enterprises also. The financial corporations are included monetary authorities and deposit money banks, as well as other financial corporation (WB, 2017).On the other hand, ratio of private sector credit to deposit can be measured by the domestic credit to the private sector by demand, time and saving deposits money in financial corporation including monetary authorities, deposit money banks and other financial corporations.

2.3.2 Access Dimension

Access to finance and financial inclusion has made a growing interest throughout the world, particularly in emerging and developing economies (WB, 2017). In real scenario, some firms and individuals have access but choose not to use such financial products and services. The most vital factor behind this concept is that, though the financial intermediaries and markets have better financial solutions and services, if it not reaches to general public in the economy, it would negatively impact on growth, income distribution and poverty level. Financial sector development indicator for the banking sector suggested that there are three types of indicators under the access dimension including broad access, household access, and firm access.

Broad access to finance shows an increasing concern over the financial inclusion which is the use of financial services by individuals and firms. There are three proxy variables for the broad access. WB (2017) has considered the Commercial Bank Branches per 100,000 adults as a measure for this indicator. The commercial bank branches are the retail locations of resident commercial banks and other resident banks which provide financial services to customers, physically separated from the main office but not organized as legally separated subsidiaries. Further Automated Teller Machine per 100,000 adults which are the computerized telecommunications devices that provide clients of a financial institution with access to financial transactions in public places.

Household access is an important indicator in an economy. Under which, households, men, and women need to access finance to achieve their variety of goals. This mechanism happens for the contingency planning, wealth creation, and credits my means of different kind of instruments. World Bank indicators defined that account at a financial institution (percentage age 15+) as the percentage of respondents who report having an account at a bank or another type of financial institution the indicator of percentage of people with a bank account. As per the Financial Inclusion Data, it indicates that this is an in-depth data on how individuals save, borrow, make payments, and manage risks. This is a world's most comprehensive database on financial inclusion that consistently measures people's use of financial services across countries over time.

Firm access is another indicator for the access dimension which is measured by the percentage of small (5-19 employees) or medium (20-99 employees) enterprises with a loan or line of credit from a regulated financial institution at the time of the survey. Further, International Financial Corporation (IFC) (2010) estimated that number of micro, small, and medium enterprises (MSMEs) in the world, to determine the degree of access to credit and use of deposit accounts for formal and informal MSMEs. The WB has recognized the collateral needed for loan % of firms with financing constraints as an indicator for the firm access to finance.

2.3.3 Efficiency Dimension

The sustainable development of a financial system and the degree to which it provides support to real sector activities depend on large extent on the efficiency with which intermediation occurs. Efficiency refers to the ability of the financial sector to provide high-quality products and services at the lowest cost. Under this categorization, there are three indicators for efficiency dimension including profitability, competition, and concentration. The relevant proxy variables for indicators have been identified as follow.

Profitability can be defined same as other entities, by earning more money than what it paid for its expenses. Humprey and Pulley (1997) defined the profit efficiency as how close a firm is to generating maximum possible outputs given a particular level of input and output prices. It is the ratio of predicted maximum profit which could be earned if a firm was as efficient as the best practice firm after adjusting for random error. Since, return on assets in the banking sector is identified as a proxy variable for this indicator which is calculated by dividing the net income from assets generated from the bank assets' of loans, securities, cash and other assets and multiply by the 100 to express it as a percentage. Furthermore, fee income plus net interest income minus operating cost can be divided by the total average assets to measure derive this ratio. The next proxy of this indicator is the net interest margin. This is indicated as a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders, relative to a number of their assets.

Next indicator is that the cost efficiency indicator, under which operating cost, leading spread and days to clearing the checks is identified. WB measures the efficiency as the ratio of operating cost to total assets of a bank. The lending spread comes next which is the difference between a lender's cost of funds and what the lender sells a mortgage for. However, as a consequence when investors perceive added risk (or less return) in the mortgage market, spreads tighten and then profit for lenders decreases and mortgage rates often go up to compensate. (Canadian Mortgage Trends, 2008). The last proxy is the days to clear cheques. This can be simply described as the process of moving funds from one account to another. Lanka Clear (2017) viewed that made arrangements for banks to extend their cheque deposit cut-off times by efficient process of clearing cheques would make payments more convenient and efficient in the country. Thus, this is a one of a modern indicator in the banking system which has greatly influenced the development of the banking sector easing the national and international payments and transactions.

To measure the banking sector competitiveness, mainly WB has recognized two indicators namely ownership and concentration ratio. The ownership indicator is

relating to the structure of the banking system. This can be measured through the structure of the banking system, simply foreign and state bank ownership, i.e. the share of assets of banks which are foreign-controlled and government-controlled. On the other hand, bank competitiveness is measured by the concentration by concentration ratio. Structure-conduct-performance paradigm assumes that there is a stable, causal relationship between the structure of the banking industry, firm conduct, and performance. It suggests that fewer and larger firms are more likely to engage in anticompetitive behavior. In this framework, competition is negatively related to measures of concentration, such as the share of assets held by the top three or five largest banks. Banking concentration can be approximated by the concentration ratio as the share of assets held by the largest banks typically three or five in a given economy or the Herfindahl-Hirschman Index (HHI), the sum of the squared market share of each bank in the system.

2.3.4 Stability Dimension

World Bank has proposed major three types of indicators for the stability dimension of financial development indicator relating to the banking sector. Capital adequacy, assets quality and liquidity are the three main indicators. Capital adequacy is the first indicator which is measured by the capital adequacy ratio. It is decided by central banks and bank regulators to prevent commercial banks from taking excess leverage and becoming insolvent in the business process. Basel III depicted that banks will face stricter capital requirements implying that the ratio of equity to risk-weighted assets should increase percentage between 8 to 1 (Bank for International Settlement [BIS], 2011).

The next indicator is the assets quality and of which there are two sides as the lender's side including non-performing loans, real credit growth, loan concentration and large loan exposures to capital while the borrower side is measured the firm leverage, interest coverage ratio and household debt to GDP. International Monetary Fund (IMF) (2017) mentioned that, risks to the solvency of financial institutions most often derive from impairment of assets. This category monitors loan quality and exposure concentrations of bank asset portfolios. Lenders side of non-performing

loans to total gross loan ratio is the defaulting loans which is payments of interest and principal past due by 90 days or more, to total gross loans. The loan amount recorded as nonperforming includes the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue (IMF, 2017). This intends to identify problems with asset quality in the loan portfolio. Then the real credit growth is measured by the WB by the proxy of ratio of domestic credit to private sector by banks to GDP which refers to financial resources provided to the private sector by other depository corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment.

Loan concentration is an indicator of the sectorial distribution of loans to total loans. It identifies exposure concentrations to particular sectors. This provides information on the distribution of loans to resident sectors and to nonresidents. Financial Stability Institute of BCBS viewed that a large concentration of aggregate credit in a specific resident economic sector or activity may signal an important vulnerability of the deposit-taking sector to the level of activity, prices, and profitability in that sector or activity (BIS, 2015).Large loan exposure to capital is defined as the total amount of credit to a borrower by a lender (Investopedia, 2017). The magnitude of credit exposure indicates the extent to which the lender is exposed to the risk of loss in the event of the borrower's default.

The first proxy variable of borrower side is the firm leverage. This is the ratio of banking sector debt to capital, which is called the leverage of the banking sector. BIS (2006) defines that the extents to which activities are financed through liabilities other than own funds. Given the need to make interest and principal payments on debt, high corporate leverage increases the vulnerability of corporate entities in the event of economic or financial market shocks and may impair their repayment capacity. More generally, the extent of corporate leverage considered together with the volatility of the environment in which corporations operate could be important indicators of the probability of corporate financial distress. Interest coverage ratio is viewed as debt service ratio by the BIS (2006). This is the earnings before interest,

taxes, depreciation, and amortization divided by debt servicing costs including principal plus interest. As the last proxy for this indicator, household debt to GDP can be identified. This is defined as the overall level of household indebtedness, commonly related to consumer loans and mortgages as a share of GDP. Given the role of households as consumers, as well as depositors of funds to deposit takers and purchasers of other financial liabilities of the corporate sector, changes in household behavior caused by a high debt burden can have a significant impact on both real economic activity and financial market developments.

Next indicator is the liquidity, which is measured by the liquid assets ratio. BIS (2006) mentioned that the liquidity available to meet expected and unexpected demands for cash. However, assessing the extent to which an asset is liquid or not involves judgment, particularly in securities and it depends on the liquidity of secondary markets. This indicator is mentioned as the bank liquid assets to total assets by the IMF (2017).

2.4 Evolution of Finance and Growth

Finance and growth nexus has become a main concern out of other issues among the economies since the era of industrial revolution. Scholars and many other interest parties have been exploring the consequences of finance towards the development of economies in everywhere in the world, since this scenarios influence for every individual in the world today. Therefore, the evolution of the finance and its consequences on economic growth is critically reviewed below.

2.4.1 Initial Development of Finance and Growth Nexus

Bagehot (1873) has initially brought the idea of relationship between the efficient capital market and industrial revolution in finance and economic growth literature. After that Schumpeter (1911) questioned whether there was a causal relationship between financial sector and economic growth or financial intermediaries aroused from industrialization. Keynes (1936) brought the liquidity preference theory stressing the full employment of equilibrium level of real interest rate which tends to be lower in order to avoid a fall in income as financial repression policies. As an

alternative to the financial repression, Tobin's model (1956) expressed that when small household producers allocate their wealth among money and productive capital, it would accelerate the economic growth in the condition of lower demand in favor of productive capital or labor ratio. Neo-structuralisms argued that high interest rate increases inflation in the short run through cost-push effects and decelerate economic growth as a result of a reduced real credit volume. When concern the real interest rate in economic context, its consequences are diverse.

Interest rate is the "rent" paid to borrow money, the lender receives a compensation for foregoing other uses of the funds including personal consumption. In Neoclassical theories, Heckscher-Ohlin Samuelson highlighted in their international trade model using two-country two-sector models. They theorized that the differences in financial development give rise to comparative advantages and mutual gains from specialization and trade, even when countries have identical endowments, consumer preference and technologies. After that, Solow (1957) viewed that growth is exogenously determined.

Early economic theories depicted that demand follows and supply leading relationship between economic growth and finance development. Propulsive role of the financial sector can play in the process of economic development and the causality question has remained an important issue in the theoretical debate ever since (Patrick; 1966; and Goldsmith 1969). However Gerschenkron (1962) viewed that role of the banking sector as "economic backwardness". He hypothesized a country's degree of economic development at the beginning of industrialization determined the role of its banking sector which needs the banks support in higher level in the initial level of industrialization. In the initial arguments, Robinson (1952) viewed that finance responds to changes in the real sector.

The theories of Patrick (1966) focused the question of causal relationship between finance and growth aroused by Gerschenkron. However, he identified two patterns of this nexus as 'demand follows' and 'supply leading'. Emphasis on demand following rule, he established that if the growth happens across sectors or industries and if it

greater which would demand for financial services and transfer savings to leading sector. On the other hand supply leading rule stressed that financial intermediation induces economic growth channeling resources from small savers and then promotes large investment in latter. As a conclusion of his theory, during early stage of economic development supply leading was initiated and latter shift to the demand following. On the other hand, the most important view was that the causality runs from finance to growth especially for developing countries and demand following pattern established that causality runs from growth to finance in more advanced economies.

2.4.2 Financial Liberalization on Economic Growth

McKinnon (1973) and Shaw (1973) found that developing countries are financially repressed and they proved that imposing constraints over the banking sector such as interest rate ceilings would results in negative real interest rates to raise. As a consequence, this would result to reduction of savings below the socially optimum level there by investment. On the other hand credit rationing programs lead to reduce the investment and productivity of the capital. Therefore, if a government imposes higher reserve requirements on banks, it would act as a tax on the banking system which leads further for depression of interest rate, since financial liberalization is critical for the banking sector development.

Scholars viewed that financial liberalization eliminates the restrictions on financial market and financial institutions when financial innovations are introduced to the financial market. Because of the financial liberalization and innovations, benefits goes to the economy in long run and this improves the efficient markets for promote lending and growth. Based on the findings of McKinnon-Shaw, Fry (1980) developed dynamic model of capable of illustrating the effect of interest rate liberalization as a means of stabilization policy. The effect of the model starting from a situation of financial repression under which interest rate liberalization has a double advantage apart from exerting a positive effect on long run growth and financial liberalization reduces contra-dictionary effect of money.

In the era on 1980s, Neo-constructivists School criticized the financial liberalization highlighting the financial deregulation from the macroeconomics point of view. Stiglitz and Weiss (1981) showed that disequilibria in the credit market may cause other than government intervention. They further highlighted on their argument, price of credit may affect the nature of the transaction and may not clear the market would resulted for adverse selection effect and incentive effect. As more consequences, when high and market clearing interest rate was occurred, it may attract bad borrowers for more risky investment projects become more likely to default. Therefore, bank will not raise the interest rate to its market clearing level and credit rationing may occur where large size loans are allocated thus adverse outcome may be the due to microeconomic shortcoming of free credit market.

Taylor (1983) and Wijnbergen (1982) brought prominent arguments specifically on developing economies. In first critics, unorganized money markets play a crucial role in determining whether financial liberalization can accelerate growth or not. Since, increases in real deposit interest rate leads to a shift of assets from unorganized to the formal credit market and existence of reserve requirements would lead to decline financial intermediation. In the second argument, they highlighted that cost-push inflation resulting from increased interest rates would lead to collapses of effective demand. Therefore, problematic feature of this model is considered as the aggregate credit and investment volume not investment efficiency (Taylor, 1983; and Wijnbergen, 1982).

In the problem of financial collapsing, small changes in the interest rate may alter the riskiness of the pool of borrowers and which was highlighted the model presented by the Mankiw (1986). Furthermore, the theory said that credit market can be collapsed if the pool of loan applicants is too risky and banks couldn’t achieve their required return. Because of the top of that restrictive monetary policy may do more than move the economy along the marginal efficiency of capital schedule cause a financial crisis at the extreme. On the other hand, it can be viewed that the removal of restrictions and freedom encourage taking unnecessary risks going on lending which influence to financial meltdown.

On the discussion of microeconomics underpinning of macroeconomic policies, Shleifer and Vishny (1986) viewed about principal-agent problems which may cause for free rider problem. This problem is raised from public good character of the costly information acquisition of an individual stockholder who may easily liquidate his financial commitment. However Kletzer and Bardhan (1987) assumed that each country, a one sector produces an intermediate good while other sector produce a final good and under which to produce the financial goods it require intermediate goods one period before the output becomes available. In this scenario, final good sector needs external funds to finance working capital, but it would unable to finance due to the asymmetries between firms and funders which create moral hazards problem.

As a result of this, highly developed financial system would be able to manage and mobilize the finance working capital more readily. Thus financially developed country has a comparative advantage in the final good while the relatively less financially developed country specializes in the intermediate good. Gennotte and Pyle (1991) add further literature for this area highlighting the implementing more stringent capital requirements in the presence of deposit insurance may lead to an increase in assets risk. This leads to monitoring and controlling of assets risk through the regulation authorities who must counteract this.

Fry (1995) highlighted that financial repression is a severe and unintended form of financial restriction to an economy. He highlighted that the second best policy for governments with low tax-raising power under which reserve requirements, interest rate ceilings, diverting savings to public sector at low or zero costs are to be happened. In an economy, if interest rate increment makes more cost, it would finally influence to the private demand. Because when the investments show a significant sensitivity to changes in interest rate and which effects to decrease the aggregate demand of both directly through investment and indirectly through the activities of IMF (1999).

2.4.3 Trade Liberalization on Finance and Economic Growth

Supporting to the Solow model, Harrison (1994) viewed that international trade openness, creates inflows of capital goods and technology which broaden industrial activity and trade in manufactured products and expand economic growth. This is possible under the assumption of increasing returns to scale. It can be identified the channels of international openness to trade through Foreign Direct Investment, capital input, goods and services flow (Pigka-Balanika, n.d).

Beck (2002) extended this analysis by showing that trade patterns depend on differences in financial development even when both sectors rely on external financing. The diversification of risk in financial system is another model introduced by the Baldwin (1992), illustrated that former country requires access to the financial system to diversify risk, because of that it allows for a decreased risk premium, a high level of financial development primarily benefits the risky sector. It is important to consider the openness to trade in banking sector development, being the banks are main intermediaries of majority of the financial sectors.

The link between trade liberalization and economic growth, relationship between finance and growth and financial development and international trade are assumed (Rajan & Zingales, 2003). They have emphasized the supply side factors, resistance of incumbent industries and financial intermediaries who have interest in a close financial sector would oppose to development of the financial market. However it is argued that, when opening the domestic sector to foreign competition and international flows of capital will become barriers their opposing and accelerate economic growth. Openness is an indispensable enabler of growth, job creation, and poverty reduction. Trade provides new market opportunities for domestic firms, stronger productivity, and innovation through competition. It contributes to poverty reduction, stronger wages, geopolitical benefits derived from deeper economic integration, and even on the personal level increased individual choice and freedom.

2.4.4 Governance on Finance and Economic Growth

Popular theories of Rajan and Zingales (2003) focused on the political incentives for financial development. In their discussion, the interest group theory suggests that development of the banking sector as well as the capital market improves competition and allows the entry of credit-constrained firms. However as a major barrier, incumbent interest groups oppose financial development. However their opposition is weaker in case of liberal trade policies and free cross-borders capital flows. Property rights institutions between the transactions of private debtors and creditors showed a major influence on financial development (Acemoglu & Johnson, 2005).

Kaufmann *et al*., (2011) defined governance as the traditions and institutions by which authority in a country is exercised. They have included three dimensions as the process by which governments are selected, monitored and replaced, the capacity of the government to effectively formulate and implement sound policies and the respect of citizens and the state for the institutions that govern economic and social interactions among them. For the purpose of empirical studies each dimensions have been included two indicators of each as follows. Process by which governments are selected, monitored and replaced is measured by Voice and accountability, Political stability and absence of violence/terrorism, Government effectiveness, Regulatory quality, Rule of law and Control of corruption.

The international donors like the IMF and the WB seek the best use of aid to achieve economic development in receiving countries, these donors use good governance characteristics introduced to evaluate the performance of receiving governments. Economic crisis in late 2000s caused many countries to suffer politically and economically as a result of weak economic infrastructures at both global and local level (Bernanke, 2009). Aggarwal, Demirguc-Kunt and Peria (2011) mentioned that lack of sustainable prior economic growth that might have lower impact of the economic crisis. The economic crisis can be defined as general slowdown of economic activity characterized by a decrease in GDP, a drying up of liquidity, and a high rate of unemployment. Thus, it would influence to decrease the international

trade and investment. Because of the economic crisis, it has caused to the economic rescission in past years in many countries. Due to this economic and financial crisis, many countries have taken economic and political actions in response to such economic crisis. It was accepted that economic crisis is not started at once and is a result of series of earlier events. Good governance as a market-promoting governance strategy emerged of the development strategies attempted by developing countries.

Government capabilities for delivering good governance is now argued to be essential for maintaining efficient markets and restricting the activities of states to the provision of necessary public goods so as to minimize rent seeking and government failure. It is found that market enhancing and growth enhancing governance focuses are important in economic growth. Market enhancing focus on the role of governance in reducing transaction cost to make market efficient and under which laid goals can be mentioned as achieving and maintaining stable property rights, maintaining a good rule of law and effective contract enforcement, minimizing expropriation risk, minimizing rent seeking and corruption, achieving the transparent and accountable provision of public goods in line with democratically expressed preferences.

Then, growth enhancing focuses on effectiveness of institutions for accelerating assets rights and high productive technology and under which some expected goals are expected to achieve. Achieving market and non-market transfers of assets and resources to more productive sectors, managing incentives and compulsions for achieving rapid technology acquisition and productivity enhancement and maintaining political stability in a context of rapid social transformation are the expected goals.

2.4.5 Financial Development and Endogenous Growth

Initially Solow (1956) introduced new model to traditional neoclassical macroeconomic model based on the Cobb-Douglas model, emphasizing that long run economic growth is propelled by the improvement of capital and efficient labor force

of an economy and improvement of the productivity by the technology. This model was contracted by the macroeconomics in which the technology is determined by the scientific process which is outside the economy. However in their simple model they highlighted that the direct consequences of long run growth rate would happen due to the growth rate of population, structure of the labor force and its productivity growth which were exogenously determined. However, this theory became the inspiration at initial stage for the policymakers and scholars which associated with exogenous sources for long run growth called exogenous growth model.

2.4.6 Evolution of Endogenous Growth Model

The relationship between financial development and long-run growth is received a new influence from the findings on endogenous growth which argues that primarily economic growth is resulted from endogenous not external forces. Theory depicts that investment in human capital, innovation and knowledge are significant contributors to economic growth. It further says that positive externalities and spillover effect of knowledge based economy lead to economic development. The long run economic growth primary depends on the policy measures by way of subsidies for research and development or education. Finance generates an external effect on aggregate sustained efficiency, which after that decrease in the marginal product of capital. Further it focused on whether financial conditions could explain sustained growth in per capita GDP. This would provide the analytical foundation to model the financial development on economic growth.

Initially, Romer (1986) tried to explain the aspects of data which were not addressed by the neoclassical model, explanation for the international differences in economic growth rates, more central role for the accumulation of knowledge and explanation for the long run growth process in instruments of macroeconomic role. Romer (1986) and Lucas (1988) introduced the technological changes to the production function as an endogenous factor. The new growth theory stressed that economic growth improve due to the increasing returns of investment by the use of knowledge rather than labor and capital.

They used the AK type, model structure and argued that lower level of complementary investments in human capital as education, infrastructure or research and development. Where the marginal product of capital is exactly constant, aggregate output Y is proportional to the aggregate stock of capital K: where A is a positive constant. Hence it is termed as 'AK theory. Further, theory highlighted that knowledge would create the spill-over effect to other firms once they captured the knowledge. However, it needed to intervene of the government with public policy making for the investment in human capital formation to create new knowledge rather than knowledge gain from their own investment in long run. Scholars viewed that human capital as consequences of investment rather than intentional accumulation of knowledge which is a non-rival productive factor. Investment on human capital as education and training would have permanent impact on the economic growth process, if further it can be extended to the specialization and high skills for vocational training which would result for research and development of rapid rate of technological progress. The studies under the human capital focuses on the ability of workers to acquire qualifications, specialization and know how, education through vocational training, and gaining the quality of human capital through the rate of entry school and scientific qualification.

King and Robson (1989) emphasized that learning by watching in their technical progress function. Investment by a firm represents innovation to solve the problems it faces. If it is successful, the other firms will adapt the innovation to their own needs and showed that innovation in one sector of the economy has the contagion or demonstration effect on the productivity of other sectors, thereby leading to economic growth.

After that the view of public investment to the endogenous economic, Romer (1990) highlighted the public investment to improve research and development for higher profit of the firms. In the model of Barro (1991) he broadens the definition of capital and its increasing and decreasing returns to growth theory. As per the Solow (1956) model, every production factor works with the condition of deceasing return towards growth in per capita GDP and function of technological improvements. However

contribution of physical capital on economic growth has been tested and further brought the idea of the explanatory power share of investment in GDP which lead to economic growth (Romer, 1986; De Long & Summers, 1992; and Barro & Lee, 1994).

On the other hand human capital factor is another important one. Lucas (1990) argued that its importance with respect the physical capital. He further emphasized the investment to education would improve the returns ultimately due to positive externalities. Romer (1990) made a difference between rival and non-rival environment for input of production. He stressed that increasing returns aroused from the externalities in R & D sector. In his model two areas were highlighted and first one is that the existing knowledge is source of human capital ends with death and second one was the basic technology knowledge that is passed over generations with continuity. In empirical studies, it was found that years of schooling used to measure the human capital (Barro & Lee, 1994).

Romer (1994) further modeled the importance of human capital learning by investment to economic growth. In his new suggestion, technological advances occur as a result of the things that people do. Thus, the discoveries are made by chance, it would lead to more discoveries with must be done by the public goods. He concluded that the ratio of working age population attended to secondary school become the measure on investment on human capital based on the study done Mankiw, Romer and Weil (1992). He took knowledge as an input in the production function. He believed that it is spillovers from research efforts by a firm that leads to the creation of new knowledge by other firms. In his model new knowledge is the ultimate determinant of long-run growth which is determined by investment in research technology.

According to the modern growth theory financial sector affect to the long-run growth through its impact on human capital accumulation, physical capital accumulation and on the rate of technological progress. However, these effects arise from the intermediation role provided by financial institutions which enable the financial

sector to mobilize savings for investment, facilities and encourage inflows of foreign capital including FDI, portfolio investment and bond and remittances, and optimize the allocation of capital between competing uses which ensuring that capital goes to its most productive use (Department for International Development, 2014). Since, Levine (1997) identified five basic functions of financial intermediaries which give rise to these effects (i) savings mobilization, (ii) risk management, (iii) acquiring information about investment opportunities, (iv) monitoring borrowers and exerting corporate control and (v) facilitating the exchange of goods and services.

2.4.7 Endogenous Growth on Baking Sector Development

On the light of the endogenous growth model, the scholars have explored the effect and behavior of the financial development as a result of economic growth. The model developed by the Greenwood and Jovanovic (1990), financial intermediation and growth are both endogenous. They hypothesized that financial institutions collect and analyses information in order to find the investment opportunities with the highest return in the economy. Under this scenario, financial intermediaries manage funds to the most productive ventures and this would increase the efficiency of investment and growth. However the effect of the financial institutions is two types; the one is that individual who get the lower returns are safer investments.

Bencivenga and Smith (1991) stressed that savings are channeled to more productive activities allowing investors to adjust the composition of their assets towards the illiquid growth enhancing ones. Under which individuals holds two types of assets liquid which is safe but unproductive and illiquid which one is high productive but risky would be differently handled with existence of financial intermediaries. Financial intermediaries divert the composition of the assets towards more risky one and increased growth and allow individuals to reduce the risk with liquidity needs by allocating investment funds more efficiently. Meanwhile, economic growth model confirms that the effect on three ways. First, it can increase the productivity of investments. Second, an efficient financial sector reduces transaction costs and thus increases the share of savings channeled into productive investments. Third, financial sector development can either promote or decline savings (Pagano, 1993).

Further study made by Bencivenga, Smith and Starr (1995) showed that financial institutions reduce liquidity risk which savers are exposed by making financial assets trading specially in stock markets or enabling depositors to withdraw cash before a project's maturity at banks. However, they assumed that it reduces the disincentives to investing in long-run projects and lowering transaction costs in financial markets.

Another added theory is that the Schumpeterian model of technological progress developed by the King and Levine (1993), which focused that how does the cost-reducing inventions applying to an intermediate product. The theory indicates that financial intermediaries and security markets persuade particular entrepreneurs to undertake innovative activity and this would affects growth through productivity enhancement. However, they theorized that financial systems affect entrepreneurial activities in four ways namely they evaluate entrepreneurs, pool resources, diversify risk and value the expected profits from innovative activities.

Nnanna, Englaina and Odoko (2004) observed that financial development can affect growth in three ways, which are: raising the efficiency of financial intermediation, increasing the social marginal productivity of capital and influencing the private savings rate. This means that the financial institution can effect economic growth by efficiently carrying out its functions, among which the provision of financial services which leads to bank profitability.

Michalopoulos, Laeven and Levine (2009) modeled the joint endogenous evolution of financial and technological innovation. Model viewed that technological and financial innovation reacting the profit maximizing decisions of individuals explores the implications for economic growth starting with Schumpeterian endogenous growth model. They stressed that financiers engage in the costly and risky process of inventing better processes for screening entrepreneurs and then financiers can invent more effective processes for screening entrepreneurs. Thus, every existing screening process becomes less effective as technology advances. Consequently, technological innovation and economic growth stop unless financiers continually innovate. This

highlighted that innovation with technology must come continuously to propel the economic growth. In practical scenario it is difficult to find the data on R & D expenditure to GDP as the mentioned proxy for technology. Therefore, it assumed that if a country is competent with better technology is able to produce more goods and export to other countries successful manner. So, to represent such scenario the proxy variable, share of manufactured export in merchandized export is selected for the technology.

2.5 Empirical Review

The determinists of the banking sector development are reviewed based on individual economies and cross country studies using different estimation made by the scholars. The following empirical findings are highlighted the employed determinists in their studies.

2.5.1 Determinants of the Banking Sector Development

Yu and Gan (2010) examined the determinants of the banking sector development in Malaysia testing the variables of perspectives of real income by the real gross domestic product, real interest rates, trade openness to GDP and financial liberalization index initially constructed by Kaminsky and Schmukler (2002). Indicators for the BSD were selected as liquid liabilities or M3/GDP, private sector credit to GDP and domestic credit to GDP estimating the relationship by the Least Square Regression. The results found that while higher GDP strength the BSD, financial liberalization showed the negative relationship with BSD. However, it further found that real interest rate and trade openness were not statistically significant with BSD.

Study done by the Razal, Shahzadi and Akram (2014), investigated the determinants of financial development and credit to private sector using proxy variables for financial development indicator in this study. They have used panel data from 1990 to 2012 on 27 developed and 30 developing countries. They used the exploratory variables of population growth, share of agriculture sector in GDP, real GDP growth, trade openness, and net foreign investment to GDP as a proxy for financial

liberalization, Government spending to GDP, index of democracy and index of rule of law. Using Fixed Effect Model, results found that in spite of rule of law and net foreign direct investment to GDP, all other explanatory variables are significant to the financial sector development.

Gezae (2015) involved in the study to explore the determinants of banking sector development in Ethiopia using the data from 1981 to 2014. They have used the multiple regressions with least square method to analyze the data. He used two models for the indicators of banking sector development; private credit by banks to GDP and broad money supply to GDP and for exploratory variables, trade openness, real interest rate, remittance to GDP as a proxy for financial liberalization, population growth, GDP growth and government expenses to GDP. Results found that trade openness, real interest rate, population growth, and Government consumption expenditure have far reaching statistically significant impact on the development of the banking sector by influencing the volume of credit provided by banks to the private sector. Remittance to GDP ratio, real Interest rate and GDP growth rate significantly impact the broad money supply (M2).

Donia (2012) founds new evidence on the determinants of the banking sector development using data for 18 emerging economies during 2000-2009. The study was done using panel data analysis with Random Effect (RE), Feasible Generalized Least Squares and Dynamic Generalized Method of Moments estimation. The author selected the variables of banking sector determinants as capital account liberalization, rule of law, property rights protection, and freedom from corruption, dummy for French legal origin and trade openness. Further real GDP per capita, remittances received and Inflation have found as macroeconomic variables with stock market capitalization as a proxy to capital market development. However, results found that rule of law, economic growth and workers' remittances promote banking sector development while financial liberalization and liberal trade policies showed an insignificant influence on banking sector development.

Huang (2010) examined the effect of the institutional policy on financial development using panel data of 90 emerging countries for the period of 1960 to 1990. Using the Bias-corrected Least Square Dummy Variable and Generalized Method of Moment, results found that institutional policy impacts on the financial development.

In the study of Klein and Olivei (2008), they studied the capital account open on financial deepening and economic growth in cross section of countries over the period of 1986 to 1995 using Ordinary Least Square. They found that liberalization of capital accounts has a significant impact on banking sector development in the presence of institutional infrastructure in OECD countries.

Ibrahim and Habibullah (2013) did a study to investigate how far have Malaysia performed from its financial development perspective compared to the other member countries for the period of 1980 to 2009 using hierarchical cluster analysis . They have used the dependent variable as private sector credit as percentage of GDP and independent variables as the Foreign direct investment as a percentage of GDP, trade openness, population growth rate and real GDP per capita.

Law and Demetriades (2006) showed that trade openness and financial openness were the significant determinants of financial development in developing countries and suggested that openness leads to higher development through better institutional quality. Positive impact of trade openness on banking sector development in lower-income countries was found.

Davis and Obasi (2009) did a study on effectiveness of banks supervision which is an essential aspect of modern financial systems, seeking crucially to monitor risk-taking by banks so as to protect depositors, the government safety net and the economy as a whole against systemic bank failure and its consequences. They used a sample of 64nations covering the period between 1995 and 2003 using static panel data model employing financial soundness indicators for the dependant variables. The explanatory variables were the level of corruption in a country, how the rule of law is

extended and the degree of voice and accountability the citizens of a particular country affect the bank risk variables, mainly through their effect on the supervision variables in the model. They are potentially exogenous instruments. Second, countries with less corruption, satisfactory rule of law and a high level of voice and accountability of its citizens should generally supervise their banks better.

Study done by the Özkan-Günay, Günay and Günay (2013) assessed the impact of regulatory policy which is a proxy under the regularity quality of World Governance Indicators on the efficiency of different sized commercial banks in the over the period 2002-2010. Overall results found that regulatory policies have a positive effect on the efficiency of banks. Particularly, large and medium size banks outperform small banks.

Boutin-Dufresne, Peña, Williams and Zawisza (2013) fond that institutional factors are very important when explaining high interest margins in the East African community using the bank level data of four regional blocks in Sub-Saharan Africa and one comparator block in the Eastern Caribbean. In here it is considered that World Bank Governance Indicators average (GIs) is the best available proxy for institutional quality, not only for its greater accuracy, but also for its wider geographical coverage as cited by the Kaufmann, Kraay and Mastruzzi (2006).

Filippidis and Katrakilidis (2014) explored the institutional quality and government policy in banking sector development, using data from 80 low, middle and high income economies during 1985–2007 applying Generalized Method of Moment estimator. They have used the dependent variable as the banking sector development and the explanatory variables are the economic institutions, political institutions, social institutions, financial openness, trade openness, inflation, GDP growth and government policy. Results found that economic institutional quality, and especially the legal dimension is the main determinant for banking sector development, social institutions have a greater impact for low and middle income countries, while political institutions have a greater impact for high income countries.

In the study of Levine *et al.,* (2000) for the period of 1960 to 1995 with five year averages, variable used for financial intermediation and legal and accounting system using traditional cross section using dynamic panel techniques. Results found that the exogenous components of financial intermediary development are positively associated with economic growth. Also, the data show that cross-country differences in legal and accounting systems help account for difference in financial development.

According to the previous empirical and theoretical findings, impact by the different variable to the banking sector development is diverse. However, the proxy variables to represent relevant indicators in the banking sector development are identified through the previous studies. Since, the private credit by deposit money bank to GDP (PCDMB) is proxied for the bank intermediation under the depth dimension, commercial bank branches per 100,000 adults (CBB) is proxied for the bank broad access under the access dimension, banks return on assets (BROA) is proxied for the bank profitability under the efficiency dimension and banks liquid assets to deposit (BLAD) is proxied for the bank liquidity under the stability dimension.

Out of the previous literature, as the determinants of the BSD, economic growth, interest rate, trade liberalization, financial liberalization and governance infrastructures are highlighted. Therefore, to explore the determinants of the banking sector development among the selected 18 countries, the proxy variables of Real Gross Domestic Product (RGDPG) for the economic growth, real interest rate (RIR) for the interest rate, trade openness (TO) for the trade liberalization, Net Foreign Direct Investment (FDI) for the financial liberalization and Governance Indicators (GVI) for Governance Infrastructures are selected.

When consider the estimation techniques which have been used to explore the impact of the determinants, different statistical estimations are available in previous studies. Ordinary Least Square method, panel data estimations and Generalized Methods of Moment (GMM) under dynamic panel data estimations are the most used techniques. According to the used techniques, GMM is most appropriate estimation method which overcomes the available weaknesses in many other techniques. To go for an

efficient estimation, GMM estimation is used. Because, in most estimation, the endogeneity in the right hand side regresses and resulting estimate bias would be a major issue that should be considered when selecting an appropriate estimation technique. Traditional panel estimation methods and least square techniques would be biased and inconsistent, because the lagged effect of dependent variable is correlated with the error term.

2.5.2 Direct and Indirect Effect of the Banking Sector Development on Economic growth

In this section, direct and indirect effect of banking sector development on economic growth is reviewed. As per the previous studies, there are huge stocks of findings on under this area. Especially the individual economies and cross country analysis shows different nature of findings align with the theories depicted. Since, the following empirical finding shows the financial sector development and banking sector development effect of economic growth.

Shaheen, Awan, Waqas and Aslam (2003) used Autoregressive-distributed lag (ADRL) approach for co-integration and granger causality test to explore the long run relationship and possible direction between international trade, financial development and economic growth for Pakistan. They selected the imports plus exports of goods and services for the proxy variable of international trade, financial size variable as the ratio of M2 to GDP and gross domestic product (GDP) for economic growth. Results found that economy supply leading hypothesis is accepted being causality runs from the international trade to economic growth while financial development to international trade.

Rachid and Mbarek (2011) did a study for the 10 countries including 6 OECD and 4 MENA during the 1990 to 2006 using The Generalized Method of Moment (GMM) system approach to explore the impact and error correction code (ECC) approach to find causality. They used the variable of Private credit by deposit money banks and other financial institutions to GDP for financial indicators and control variables of annual change in consumer price index and ratio of government consumption to

GDP. In this study economic growth is measured by the GDP per capita. Result found that long-term relationship between financial development and economic growth for the OECD and the MENA countries are positive and strong while the bi-directional causality among the MENA countries. Unidirectional causality runs from financial development to economic growth.

Mhadhbi (2014) involved in a study using new indicator for financial development and economic growth with sample of 27 medium income countries for the period of 1970 to 2012 to test the direction of causality between finance development and economic growth using Seemingly Unrelated Regression (SUR) and Wald Test. He has found three new variables which represent the financial system as financial systems' share in GDP, Number of banks and braches per capita and share of labour employed in the financial system. Findings supported the supply-leading hypothesis, as many financial development variables lead economic growth in Benin and Zimbabwe. Results confirmed for twenty one Low-income Countries suggesting that their financial development does not depend on economic growth.

Koivu (2002) analyzed the relationship between financial sector and economic growth in 25 transition countries from the period of 1993 to 2000 using a fixed-effects (FE) panel model and unbalanced panel data. The study measured the qualitative development in the banking sectors using the margin between lending and deposits interest rates and for second variable for the level of financial sector development is the amount of bank credit allocated to the private sector as a share of GDP. The economic growth was measured by the annual real GDP growth. To control the effect of economic growth, the reform index (RI) including five indicators and inflation rate (IFR) is applied. Results found that the interest rate margin is significantly and negatively related to economic growth and a rise in the amount of credit does not seem to accelerate economic growth.

Hasan, Koetter and Wedow (2007) employed a sample data of firm-level around 7,000 banks in EU-25 between 1997 and 2003 using the stochastic frontier analysis to derive the profit efficiency which was a proxy for the quality of the financial

institutions with private credit and interaction of profit efficiency and private credit. The dependent variable, economic growth is measured by the per capita GDP with the control variable of population growth. Results found that positive relation between banking quality and economic growth in such countries. He emphasized that the direct measure of finance quality rather than quantity such as credit to the private sector is appropriate.

Aurangzeb (2012) studied the contribution of banking sector in economic growth in Pakistan. He used the data sample of 10 banks for the period of 1981 to 2010 with ordinary least square (OLS) and Granger causality analysis. The data to measure the banking sector by deposit, investment, advances, and profitability and interest earnings were used. The results found that such explanatory variables have a positive impact on economic growth and the Granger-Causality test confirms the bidirectional causal relationship of deposits, advances and profitability with economic growth. On the other side results found unidirectional causal relationship of investments and interest earnings with economic growth runs from investments and interest earnings to economic growth.

Awdeh (2012) used sample of 1992 to 2011 in Lebanon to explore the banking sector development on economic growth employing the Granger causality analysis and regression estimation while utilized size, activity and efficiency variables from financial sector. Variables used to capturing the size, activity and the efficiency of financial sector. Credit to resident private sector as a percent of GDP, banking market interest rate spread, banking sector assets-to-GDP ratio, concentration ratio as market share (assets) of the top 5 banks and annual growth rate of total sector's deposits were the respective variables. However results found that a one-way causality running from economic growth to banking sector measures such as deposit growth and credit to local private sector. Conversely, credit provided by banks to the resident private sector, and the banking sector size, efficiency, and concentration do not impact significantly economic growth. These results provide support for the demand-following hypothesis.

Study done by Prochniak and Wasiak (2016) including the 28 EU and 34 OECD economies and the 1993–2013 periods, measure the impact of the development and stability of the financial sector on economic growth using Blundell and Bond's GMM system estimator. To measure the financial sector, variables of domestic credit provided by financial sector, bank nonperforming loans, bank capital to assets ratio, market capitalization of listed companies, turnover ratio of stocks traded, and the monetization ratio were employed. Results found that financial sector stability showed a relationship with economic growth. Further large size of the financial sector does not lead the economic growth. However the model was included to control the effect of economic growth and which are the inflation rate, population growth, investment rate, fertility rate, life expectancy at birth (years), the share of population aged 15–64, the openness rate and government consumption.

Jordan and Tucker (2013) did the study in Bahamas, to explore the impact from non-performing loans to economic growth. Period from September 2002 to December 2011, quarterly data were utilized with vector error correlation and regression model. Results revealed that growth in economic activity tends to lead to a reduction in nonperforming loans, and there is additionally a small but significant feedback effect from nonperforming loans to output. However the study employed the macroeconomic control variables including air arrivals, which served as a proxy for tourism sector output, foreign direct investment, the weighted average loan rate and inflation.

Onaolapo (2015) did a study on financial inclusion on economic growth of Nigeria and conceptualized that bank intermediation enhance the financial inclusion which is the extent of involvement or participation in financial activities. Results highlighted that especially, it affects the low-income earners or rural dwellers towards the economic growth of a country by number of commercial bank branches per the 10,000km^2. Out of the empirical studies and availability of the cross country data, private credit by deposit money bank account to GDP, commercial bank branches to 100,000 people, banks returns on assets and bank liquidity assets to deposits is selected for the indicators for the banking sector development.

Lucchetti, Papi and Zazzaro (2000) done a study to explore the relationships between banking and economic growth by suggesting a new indicator for the state of development of the banking system based on a measure of bank microeconomic efficiency. They have done the study in the Italian region for the period of 1982 to 1994 using the Generalized Method of Moment. This choice helps to overcome the problem of causality and to capture the effects of the banks' allocated activity. The empirical results indicated that the existence of an independent effect exerted by the efficiency of banks on regional growth and results concluded that the effectiveness of banks is the factor influencing economic growth. However the model was included three control variables on economic growth. The mentioned control variables are human capital, transport cost and efficiency of the legal system.

Adekola (2016) did a study on the effect of bank profitability on economic growth in the Nigerian banking industry, covering a period of ten years from 2005 to 2014 for selected five banks within the Nigerian banking industry. He used a pooled ordinary least square regression (POLS) estimation. Results posited that any change in banks profitability represented by return on capital employed and return on equity will significantly cause a change in the economic growth which is represented by gross domestic product. The result specifically concluded that a direct relationship existed between interest rate and the growth of the economy (GDP) which increased in interest rate will certainly increase savers. To capture the real effect of the variable ratio of gross fixed capital formation to GDP is selected.

Gründler and Weitzel (2013) did a cross country analysis including 188 countries over the time period between 1950 and 2010 to explore the financial sector development on economic growth. To measure the financial sector, overall liquid liabilities of the financial system divided by GDP and the claims of deposit banks in relation to GDP is used. Real GDP per capita growth is employed to capture the economic growth. Endogenous growth model is tested using the variables of human capital by average years of schooling and life expectancy at birth. The control variables are the fertility rate which account for population growth, investment share for savings, government consumption, democracy variable and rule of law, trade of

terms and dummy variables. The study applied the GMM and 3SLS estimations of simultaneous equation models and results found that finance in general exerts a positive influence but this influence vanishes in the development process and eventually becomes negative. Further it said that when finance still boosts growth in developing countries, a growing financial sector hinders the increase of incomes in rich economies.

King and Levine (1993) used four variables representing size and intermediation of the banking sector: ratio of liquid liability to GDP, ratio of deposit money bank domestic assets to deposit money banks domestic assets plus central bank domestic assets, credit issued to private enterprise divided by credit issued to central and local government plus credit issued to public and private enterprises and credit issued to private enterprises divided by GDP in the study of sample 80 countries from the period of 1960 to 1986 in a cross section using regression analysis. Further they have used the real per capita GDP, real per capita capital stock, ratio of gross national investment to GDP and growth rate of other every factors including technology growth, human capital accumulation, increases in the number of hours worked per worker, and improvements in the employment of factor inputs. After that the model was included the control variables which are the initial income, government expenditure, trade openness, inflation rate, initial secondary school enrolment rate and control variable for other economic phenomenon. They concluded that financial services indicators are strongly and robustly linked to economic growth and productivity improvement. Further financial development indicator strongly linked with the rate of physical capital accumulation, and improvements in the efficiency of capital allocation. Therefore financial development indicators significantly predict subsequent values of the growth indicators. Thus financial services stimulate economic growth by increasing the rate of capital accumulation and by improving the efficiency with which economies use that capital.

Berthélemy and Varoudakis (1996) introduce reciprocal externalities between the financial sector and the real sector into a learning-by-doing endogenous growth framework. They assumed that positive influence of financial sector on capital

efficiency on growth and external effect of the real on the financial sector via savings. In this mechanism, the financial sector channels savings to more productive uses by collecting and analyzing information on investment opportunities in return expansion of real sector due to increment of volume of savings. Finally it was believed to happened improvement of size of the financial market induce more competition and technical efficiency through learning by doing in financial sector. However, under with this variable some other control variables have been used the scholars.

Kargbo, Ding and Kargbo (2016) examined the relevance of finance and human capital on growth and its link between financial development and human capital accumulation on economic growth in Sierra Leone from 1980-2012. They used the Ordinary Least Squares (OLS) regression estimation technique and ganger causality test. This study shows that the simultaneous interaction of financial development and human capital accumulation are significant and impact positively on growth. They employed secondary school enrolment as a proxy for human capital on finance to capture the simultaneous effect of finance and human capital on growth of output via and further used the financial development indicators mainly banking sector development indicators including broad money, liquidity liabilities, and credit to the private sector. Ganger causality test confirmed that causality is existed between financial sector development, human capital accumulation and economic growth. The growth model is confined with dependent variable by the real GDP growth and control and condition variables by inflation rate measured by consumer price index, physical capital measured by gross capital formation to GDP, gross national saving to GDP, population growth rate and human capital measured by secondary school enrolment rate.

Ahangari and Morad (2014) did a study to explore the effects of financial development and inflation on economic growth in Iran for period of 1965 to 2011. They have employed the 3 Stage Least Square regression and Engle-Granger causality test. Under which two model have been developed; first, economic growth model specifying the real GDP growth rate for economic growth and investment on

GDP, population growth rate and financial development indicators of money and quasi money, domestic credit to private sector, liquid liabilities and quasi liquid liabilities. The second model, financial development indicator in dependent variable while the explanatory variables of inflation, government expenses, trade openness and real GDP growth were used. Results found that financial development is viewed as an important channel through which inflation can adversely affect growth. Also, the level of financial development is strongly associated with per capita GDP growth and openness. The results of Engle-Granger causality test confirm the existence of bidirectional causality between economic growth and financial development indicator.

Rajan and Zingales (1998) found that industries that are naturally heavy users of external finance grow relatively faster in economies with higher levels of financial development using panel data covering 42 countries and 36 industries. Because these industries are usually R&D-intensive, in which more advanced technologies are used or new technologies are created, therefore financial development might contribute to productivity growth through providing necessary financial support to the development and expansion of these industries.

Valverde *et al.,* (2004) explored the financial innovation in banking on regional economic growth in Spain, With the objective to find the evolution of regional banking sectors and related financial innovations, variables were measured through the Mutual fund business/GDP: as a proxy for product innovation, ATMs/branches: as a first proxy of technical change, Number of cards issued: the total number of bank credit and debit cards showing technological developments in payment services and other five variables. They covered the 17 administrative regions19 of Spain over the period 1986- 2001 using GMM estimation. Results found that product and service delivery innovations contribute positively to regional GDP, investment and gross savings growth. Since, financial intermediaries responded to these demands, these changes will stimulate a higher economic growth.

Based on the six governance indicator, the empirical finding have been illustrated to highlights its impact on the economic growth. AlBassam (2013) used the six indicators to explore the relationship between governance and economic growth during times of crisis before 2008 and after using data on 215 countries with correlation analysis. The results demonstrated that the global economic crisis has had an unnoticeable influence on the relationship between governance and economic growth. This study found that different levels of development of nations affect the relationship between governance and growth in various ways during times of crisis.

Emara and I-Ming Chiu (2016) evaluated the impact of governance on economic growth using a group of 188 countries for seven years. They created a composite governance index (CGI) that summarizes the existing six governance measurements in the Worldwide Governance Indicators (WGI), using the Principal Components Analysis (PCA) method. The first principal component derived from the WGIs explains as much as 81 percent of the variations in the original six WGI measurements on PPP adjusted constant per capita GDP data to find that per capita GDP would raise by about 2 percent if the CGI increases by one unit.

Pere (2015) done a study to explore the impact of good governance in the economic development of Western Balkan countries for the period of 1996 to 2012 using an econometric model based on the examination of panel data. Results found a dependence of economic growth on the good governance level. In some cases the dependence of these indicators is negative, while in some other cases it is not statistically significant. The statistical analysis shows that political stability, absence of violence and the strengthening of law enforcement affect the growth of the same period, but it is not evident for other indicators. Statistical analysis shows that some aspects of good governance can be better identified for their impact on economic growth, displaced in time. Governance accountability affects economic growth in future periods, which means it has a slower future impact.

Elgin and Cakır (2014) used a study using the technological progress component of the total factor productivity (TFP) growth and several scientific and technological

indicators using data from 160 countries over the period from 1960 to 2009 in Turkey. They have used a stochastic frontier analysis to decompose the growth in TFP into three components such as technological progress, scale effect and change in technical efficiency. Following variables used for the study and which were the number of scientific and technical journal and engineering articles in several fields such as physics, biology, and space sciences, number of technicians in R&D and equivalent staff per million of population. These people's work primarily necessitates technical knowledge and experience in engineering, physical or social sciences, ratio of amount of high technology export to the amount of manufactured export. high technology exports are exported products that is produced by using R&D intensely such as computers, aerospace and pharmaceuticals, the ratio of high technology export to GDP, the number of patent applications made by residents and non-residents in a given year, the number of trademark applications made by residents and non-residents in a given year, the ratio of sum of payments and receipts of royalty to GDP, the ratio of expenditures for research and development, including public and private research and development expenditure to GDP and researchers in R&D per million of population. The results among several technological and scientific indicators, number of scientific articles, number of patent applications and number of trademark applications are consistently positively correlated with the technological progress component of the growth in TFP.

According to the empirical and theoretical findings, the direct and indirect impact of the banking sector development on economic growth is identified. The empirical results show that the different results of the BSD on EG are explored based on different purposes. Scholars have explored the causality, linearity and impact between BSD and EG. On the other hand, some evidence shows the BSD has impacted to the EG through different channel variables. Therefore the study is able to capture the direct and indirect impact of the BSD on EG.

To construct the main growth equation and channel effects on economic growth, the dependent and independent variables are extracted from the reviewed literature. At the inception, indicators for the banking sector development were found in the

empirical review section under the determinants of the BSD. The found proxy variables are private credit by deposit money bank to GDP (PCDMB), commercial bank branches per 100,000 adults (CBB), banks return on assets (BROA) and banks liquid assets to deposit (BLAD) are selected.

The variables and proxy variables for main growth equation are identified below. Real Gross Domestic Product (RGDPG) as a proxy variable for the economic growth (EG) is selected for the dependent variable. Then human capital (HC) is measured by the average working population with secondary and tertiary level education (ASTEP), physical investment (PI) is measured by the gross fixed capital formation to GDP (GFCF), technology (TC) is measured by the share of manufacturing exports as a share of merchandise export (MEME) and governance infrastructure is measured by the first principal component of governance indicators (GVI).

For the control variables in main growth equation, government consumption expenditure to GDP (GCE) for the government consumption, log of the per capita GDP (lnPGDP) for the initial income (II), foreign direct investment (FDI), trade openness (TO) for international trade, natural resource rent (NRR) for abundant of natural resources in an economy, annual growth of the population (AGRP) and inflation rate (IFR) are selected.

To explore the indirect effect of BSD on EG, the relevant channel variables and control variables are identified as follows. Initially the control variables for physical investment (PI) is selected as government consumption expenditure to GDP (GCE), initial income (II), inflation rate (IFR), foreign direct investment (FDI), trade openness (TO), rule of law (ROL) and democracy index (DMI) are selected.

Human capital is included with the control variables of technology (TC) is proxied by the share of manufacturing exports as a share of merchandise export (MEME), government consumption expenditure to GDP (GCE), initial income (II), trade openness (TO) rule of law (ROL) and population over 65 and population under15 (AGP).

Channel variable of technology (TC) is confined with the human capital (HC) is proxied by the average working population with secondary and tertiary level education (ASTEP), government consumption expenditure to GDP (GCE), initial income (II), inflation rate (IFR), trade openness (TO), rule of law (ROL), number of live births per 1000 women between the age of 15 and 44 (AFR), terms of trade (TOT) and labor force with primary education level (PELF).

Finally the new governance infrastructure (NGVI) is included the control variable of government consumption expenditure to GDP (GCE), initial income (II), primary education enrolment rate in population (PEE) and

When consider the estimation techniques which have been used to explore the causality, non-linearity and impact, different statistical estimations are available in previous studies. Ordinary Least Square method, panel data estimations and Generalized Methods of Moment, fixed effect method (FE), pooled least square regression (POLS) and seemingly unrelated regression (SUR) have been used in many studies. According to the employed techniques, Three Stage Least Square (3SLS) is most appropriate estimation method which overcomes the available weaknesses in many other techniques. Further, to go for an efficient estimation, the possible parameter biasness is a major concern in the above structural models as several endogenous variables appear in the right hand side of the structural equation. Therefore, three-stage least squares (3SLS) estimator, introduced by Zellner and Theil (1962). 3SLS estimator combines the properties of two-stage least squares (2SLS) and seemingly unrelated regression (SUR) estimators.

2.6 Chapter Summary

Review showed that the determinants of the banking sector development are interlinked with each other variables when concern the theoretical evolution. When it moves to the empirical studies, the cross country evidences showed that determinants of the banking sector developments have been evolved over the previous years.

Economic growth is critically discussed based on the endogenous growth theory which has evolved from the neo-classical economic models. Then scholars have used the endogenous model in the finance growth nexus bringing new ideas especially for the banking intermediation among the finance sector. Depicted theories and empirical findings highlighted the diverse range of results based on the different economies. However, cross country evidence showed that the majority of the studies done to explore the causality and its relationship with different perspectives on the finance sector development. Thus, it is required to make further contribution towards the banking sector development under this study.

It was found that in previous studies, the possible biasness of the parameters and endogeneity in the right hand side regressors have been ignored. Therefore, such estimation has resulted to create the bias estimation which became a major issue in the studies. Furthermore, the requirement to exploring the direct and indirect effect of the banking sector development on economic growth has highlighted the various gaps in such studies. Since, to overcome such drawbacks, the use of GMM and 3SLS has been recommended by some authors.

CHAPTER THREE
MATERIALS AND METHODS

3.1 Introduction

The research design is an essential item for any study. Since, this chapter details to the selection of countries for the study, variables, and conceptual framework and estimation tools.

3.2 Selection of Countries

The criterion to select the countries is shown in Table 3.1. The following criterions were used to select the proper mix of countries for the study. Initially, the total exports and imports values of Sri Lanka with world during the year 2006 to 2014 was ranked ascending order. Then the countries with highest trade openness were sorted including the countries in South Asian region. Finally, the countries with data availability for the relevant variables are considered and 18 countries were sorted

Table 3.1: Countries Representing Exports and Imports with Sri Lanka, Regions and Income Level.

Country	Exports and Imports (USD) (000)	Region	Income Level
Afghanistan	11,002.05	South Asia	Low
Australia	2,313,847.31	East Asia & Pacific	High
Bangladesh	526,933.27	South Asia	Lower middle
China	15,027,232.36	East Asia & Pacific	Upper middle
India	25,655,969.79	South Asia	Lower middle
Indonesia	2,978,192.64	East Asia & Pacific	Lower middle
Japan	5,656,796.54	East Asia & Pacific	High
South Korea	2,378,837.67	East Asia & Pacific	High
Malaysia	3,942,090.37	East Asia & Pacific	Upper middle
Nepal	81,446.47	South Asia	Low
Pakistan	2,705,021.78	South Asia	Lower middle
Russia Federation	2,307,313.28	Europe & Central Asia	Upper middle
Singapore	11,232,882.75	East Asia & Pacific	High
Thailand	3,372,252.34	East Asia & Pacific	Upper middle
UAE	8,725,106.84	Middle East & North Africa	High
UK	10,157,604.54	Europe & Central Asia	High
USA	15,143,213.78	North America	High
Sri Lanka		South Asia	Lower middle

Source: World Integrated Trade Solution, World Bank (2017)

The selected 18 countries in the sample represents the more than 66% of total exports and imports during the period of 2006 to 2014. The selected countries have recorded the exports and imports of $ 134,315,216.41 out of the total exports and imports of $ 202,992,447.75. Further, selected countries represent the countries from different region of the World: South Asian, East Asia & Pacific, Europe & Central Asia, Middle East & North African and North American regions. Furthermore, it stands for different income level of the World: Low, Lower middle, High and Upper middle.

The data on selected variable are extracted for the period of 2006 to 2014 in relation to the selected 18 countries. The period of the study is confined with the 9 years. According to the global economic behaviour, year 2006 recorded a favourable result for the economic performances as well as other macroeconomic variables. However, the global economic downturn happened with the financial crisis which became crucial in the period of 2007 to 2010. Creating diverse range of economic consequences, global economic is still recovering to the normal level but not the level it was before the crisis. Since, data for the variables considered in the study were selected for the period of 2006 to 2014.

3.3 Conceptual Framework

The conceptual frameworks used for this study are shown in Figure 3.1, 3.2 and 3.3. The Figure 3.1 depicts the conceptual framework which illustrates the relationship between the determinants of the BSD. It explains that BSD indicators represent the dependant variable while the determinants represent the independent variables. The prevailing conceptual framework is defined separately according to the four indicators of the BSD: Intermediation (IM), Broad access (BA), Profitability (PF) and Stability (ST). Furthermore, as proposed by the GMM, lagged value of the BSD is included in the model to remove the endogeneity.

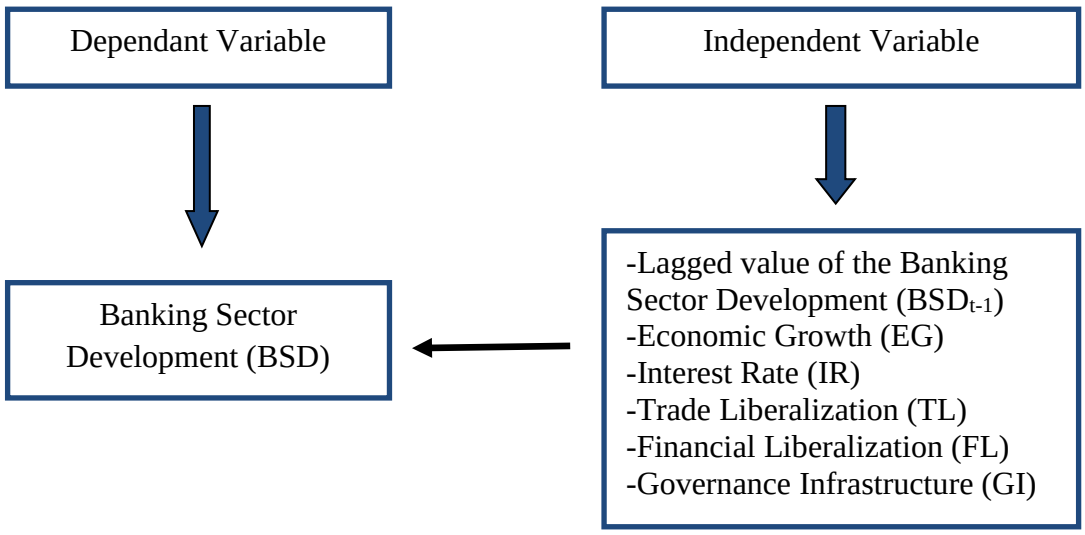

Figure 3.1: Conceptual Framework for Determinants of the Banking Sector Development

Next, the Figure 3.2 shows the direct effect of the BSD on EG. The depicted framework is confined with three sets of explanatory variables including banking sector variables, channel variables and control variables. Same as in Figure 3.1, banking sector development indicators are the intermediation (IM), broad access (BA), profitability (PF) and stability (ST) which apply for this framework separately to explore the direct effect.

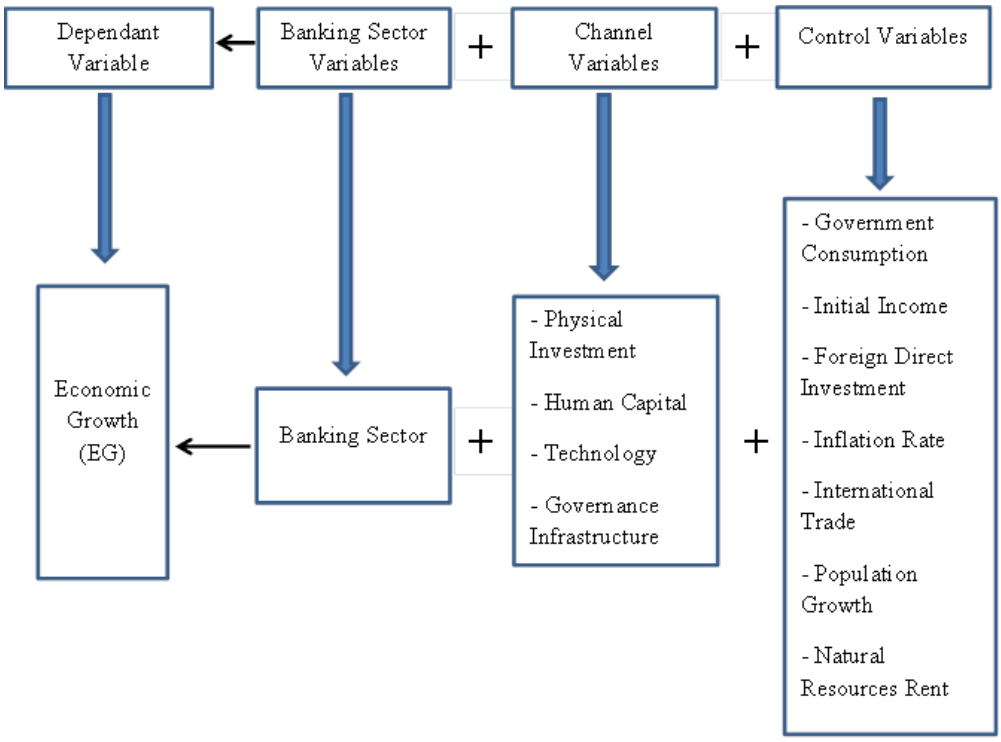

Figure 3.2: Conceptual Framework for Direct effect of Banking Sector Development on Economic Growth

The given conceptual framework in Figure 3.2 indicates that the indirect effect of BSD on EG. The framework depicts the relationship between BSD and EG through channel variables and effect of control variables. Banking sector is represented with intermediation (IM), broad access (BA), efficiency (EF) and stability (ST) and which are to be defined with separate application in the model.

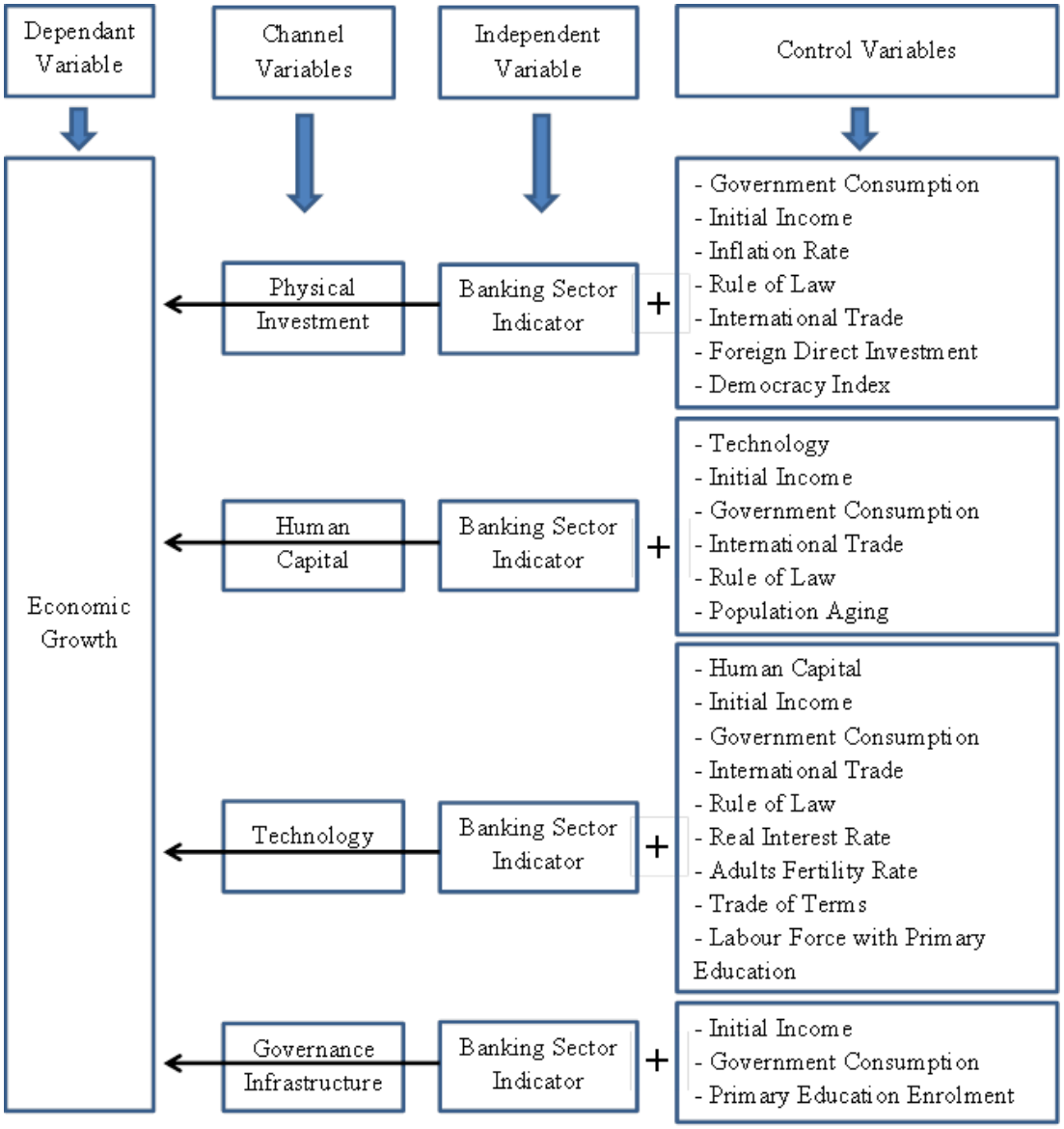

Figure 3.3: Conceptual Framework for Indirect Effect on Banking Sector Development on Economic Growth

3.4 Secondary Data

3.4.1 Selection of Variable for the Dependant Variable in Determinants of the Banking Sector Development

The variable selection for the dependant variables in the determinants of the BSD for the developed model is represented by the four indicators as shows in Table 3.2.

Table 3.2: Four Indicators for the Dependant Variable in the BSD

Variable Code	Indicator	Proxy Variable	Source
IM	Intermediation	Ratio of private credit by deposit money banks to GDP	International Monetary Fund (IMF) database
BA	Broad Access	Commercial bank branches per 100,000 adults	
PF	Profitability	Banks' return on assets	
LQ	Liquidity	Banks' liquid assets to deposit	

3.4.2 Selection of Explanatory Variables in Determinants of the Banking Sector Development

The variable selection for the independent variables in the BSD model is shown in Table 3.3.

Table 3.3: Independent Variables in the BSD

Variable Code	Variable	Proxy Variable	Source
EG	Economic growth	Real Gross Domestic Product Growth	International Monetary Fund (IMF) database
IR	Interest rate	Real Interest Rate	World Bank Development Indicators (WDI) database
TL	Trade liberalization	Trade Openness	International Monetary Fund (IMF) database
FL	Financial liberalization	Foreign Direct Investment	World Bank Development Indicators (WDI) database
GI	Governance Infrastructure	New Governance Indicator	Worldwide Governance Indicator (WGI) database

3.4.3 Selection of Dependant Variable in Direct Effect of the Banking Sector Development on Economic Growth

The variable for the dependant variable in the main growth model of BSD on EG is shown in Table 3.4.

Table 3.4: Dependant Variable in the Direct Effect of the BSD on EG

Variable Code	Variable	Proxy Variable	Source
EG	Economic growth	Real Gross Domestic Product Growth	International Monetary Fund (IMF) database

3.4.4 Selection of Banking Sector Development Variables, Intermediate Variables and Control Variables in Direct Effect of the Banking Sector Development on Economic Growth

Independent variables in the BSD on EG model are represented by the banking sector development variables, intermediate variables and controls variables. Thus, the banking sector development variables are represented in above Table 3.4 and other intermediate variables are shown in below Table 3.5.

Table 3.5: Intermediate Variables and Control Variables in Direct Effect of the BSD on EG

Variable Code	Variable	Proxy Variable	Source
PI	Physical Investment	Gross fixed capital formation to GDP	World Bank Development Indicators (WDI) database
HC	Human Capital	Average of the secondary and tertiary level education with age 25 or above in the population	
TC	Technology	Share of manufactured export in merchandized export	
GI	Governance infrastructure	New Governance indicator	World Wide Governance Indicators (WGI) database

3.4.5 Control Variables in Direct and Indirect Effect of Banking Sector Development on Economic Growth

The control variables are used in the direct and indirect effect of the BSD on EG models. Thus, the selected control variables are shown in below Table 3.6.

Table 3.6: Control Variables in Direct and Indirect Effect in BSD on EG

Variable Code	Variable	Source
GCE	Government Consumption expenditure to GDP	World Development Indicator database
II	Initial Income (Log of Per capita Gross Domestic Product)	World Bank Open database
IFR	Inflation rate	International Monetary Fund database
FDI	Foreign Direct Investment	World Bank Development Indicators (WDI) database
TO	Trade openness	World Development Indicator database
GRPO	Annual growth of population	World Bank Open database
NRR	Natural resource rent	World Bank Open database
AFR	Adolescent fertility rate	World Development Indicator database
TOT	Terms of trade	World Bank Open database
ROL	Rule of Law	World Wide Governance Indicators (WGI) database
DMI	Democracy index	Economist Intelligence Unit (EIU) database
PEE	Primary education enrolment rate	World Development Indicator database
PELF	Primary level education in labour force	World Development Indicator database
PAG	Population aging	World Development Indicator database

3.5 Methodology of Data Analysis

3.5.1 Descriptive Statistics

Initially, the mean, standard deviation, maximum and minimum estimations for panel data are used for the descriptive statistics presentation to highlight the overall, between and within behaviour of the variables in selected countries.

3.5.2 Correlation Coefficient

The correlation coefficient is one of the most common and useful test in statistics. This is used to find the strength of the linearity between two variables. The correlation coefficient between X and Y is given by Formula 3.3.

$$r = \frac{N\sum XY - \sum(X)(Y)}{\sqrt{[N\sum x^2 - \sum(x^2)]\ [N\sum y^2 - N\sum(y^2)]}} \quad (3.3)$$

Where,

r = Pearson r correlation coefficient

N = number of value in each data set

$\sum XY$ = sum of the products of paired scores

$\sum X$= sum of X scores

$\sum Y$ = sum of Y scores

$\sum x^2$ = sum of squared X scores

$\sum y^2$= sum of squared Y scores

UnderH_0: $\rho = 0$, vs. $\rho \neq 0$ is tested by the following statistics in Formula 3.4.

$$T = r\sqrt{\frac{n-2}{1-r^2}} \quad (3.4)$$

UnderH_0, $T \sim t_{n-2}$

3.5.3 Principal Component Analysis

Principal component analysis (PCA) is a statistical procedure that uses an orthogonal transformation to convert a set of large correlated variables into a set of values of linearly uncorrelated variables. These linear uncorrelated variables are called

principal components. The number of principal components is generally equals to the smaller of the number of original variables. Thus PCA involves:

- Transform the multi-dimensional data set into number of new variables (principal components) which are independent of each other.
- Each principal component is a linear combination of the original variables.
- The first principal component(PC) accounts for the maximum variance of the original system
- The 2nd PC accounts for the maximum variance of the original system that has not been accounted for by the 1st PC.
- The 3rd PC accounts for the maximum variance that has not been accounted for by the 1st & 2nd PCs, So on.

Let X_i (i=1, 2…., p) be i^{th} variable of p observed variables which are supposed to be correlated. In general, it is always a better practice to transform all the original variables in to a common platform by standardizing the original variables so that initial variables of which PCA is carried out have mean zero and variance one. Thus the total variance of the initial p-dimensional system is p. The output of the PCA is dependent on the eigenvalues of the correlation matrix of the observed variables and the corresponding eigenvectors. In PCA new set of p variables known as PCs are formed such that given in Formula 3.5 and 3.6.

$$PC_i = \sum_{j=1}^{p} a_{ij} X_j, i = 1,2 \ldots . p \quad (3.5)$$

Let $PC_i = Y_i (i = 1, 2, \ldots . , p)$, Thus

$$Y_i = \sum_{j=1}^{p} a_{ij} X_j, i = 1,2 \ldots . p \quad (3.6)$$

The coefficient a_{ij} (i=1,2…p and j=1,2…p) is the j^{th} eigenscore of the i^{th} PC and the vector $a_i = (a_{i1}, a_{i2}, \ldots . a_{ip})$ is the eigenvector of the i^{th} eigenvalue of the correlation matrix of X.

Thus the PC_1, PC_1 and PC_P are given below in formulas 3.7, 3.8 and 3.9.

$$Y_1 = a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + ...a_{1p}X_p \quad (3.7)$$

$$Y_2 = a_{21}X_1 + a_{22}X_2 + a_{23}X_3 + ...a_{2p}X_p \quad (3.8)$$

.

.

$$Y_p = a_{p1}X_1 + a_{p2}X_2 + a_{p3}X_3 + ...a_{pp}X_p \quad (3.9)$$

It is known that

$V(Y_i) = V(PC_i) = \lambda_i$where λ_i is the i^{th} eigenvalue of the correlation matrix and $\lambda_1 > \lambda_2 > \cdots > \lambda_p$

$\sum V(Y_i) = \sum_{i=1}^{p} \lambda_i = p$

The percentage of variability explained by the i^{th} PC = $\frac{\lambda_i}{\sum_{i=1}^{p} \lambda_i} * 100 = \frac{\lambda_i}{p} * 100$

The cumulative percentage of variability explained by the q (< p) number of PCs = $\sum_{i=1}^{q} \frac{\lambda_i}{p} * 100$

Correlation between PC_i and X_j is given by $a_{ij}\sqrt{\lambda_i}$

The important aspect in PCA is deciding the appropriate number of principal components. This decision is dependent on how much information one is willing to sacrifice (unaccounted variance of the initial system).The commonly recommended method is to select the principal components whose eigenvalue is greater than one. In other words, variance explained by each of the selected component is larger than mean variance of the system explained per principal component (one).

3.6 Model Specification on Determinants of the BSD

According to the initial objective of this study, the determinants of the BSD are explored. Indicators of the BSD are initially identified through the previous studies on financial sector development, financial intermediaries and banking sector performance largely on cross country panel data. Though there are many indicators of the BSD, proxy variables on four indicators of the financial sector development were selected, since the unavailability of the data for many other indicators for some

countries. In some instances, the data estimations showed differences for same indicators in different indexes. Though the proxies have used for the many indicators under the banking sector development, there are differences in measuring such proxies in country levels. When construct the variables and relevant proxies for such variables on the determinants of the BSD, the measurement of such determinants are vary according to the performance of the country level. In here, the endogeneity is one of the challenges in determining the variables from macroeconomic environment and measurement of the banking sector indicators. Another problem is the unobservable heterogeneity across the banks in different nations, which will be largely, varies due to the governance of the country and its financial system.

As mentioned earlier, BSD is proxied by the four variables including private sector credit by deposit money bank to GDP for intermediation (IM), commercial bank branches per 100,000 adults for broad access (BA), banks return on assets for profitability (PF) and banks liquid assets to deposit for liquidity (LQ). Then, the determinants of the BSD are the economic growth, interest rate, financial liberalization, trade liberalization and governance infrastructure. However, the economic growth (EG) is measured by the real gross domestic product growth interest rate (IR) is estimated by the real interest rate, financial liberalization (FL) is measured by the net foreign direct investment, trade openness is represented for the trade liberalization (TL).

Further governance infrastructure (GI) estimated by Kaufmann *et al*., (1999) covers most of the features of institutional environments. They are: Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Voice and Accountability, and Rule of Law. According to Globerman and Shapiro (2002) these indicators are considered as superior to other that have been used elsewhere, because they are estimated using 31 different qualitative indicators from 13 different reliable sources. Thus, these meta-indices would encompass most of the other measures. However, these indices highly correlate with each other. Therefore, following Globerman and Shapiro (2002), an

aggregate measure of these is obtained by estimating their first principal component, which would efficiently represent the institutional excellence.

Furthermore, the model is extended by introducing a lagged dependent variable. Because BSD is persistent, failure to capture that persistency would lead to inconsistent estimates. Therefore, the dynamic panel model developed to measure the effect of the determinants on BSD would take the following form.

Thus, the model equation for the BSD is given in following Formula 3.10.

$$BSD_{i,t} = \beta_0 + \lambda BSD_{i,t-1} + \beta_1 EG_{i,t} + \beta_2 IR_{i,t} + \beta_3 FL_{i,t} + \beta_4 TL_{i,t} + \beta_5 GI_{i,t} + \varepsilon_{i,t} \quad (3.10)$$

Where i = 1……18 countries, t = 1…..9 years

Where, $BSD_{i,t}$ is the BSD of country i in the year t. $EG_{i,t}$ is the economic growth of country i in the year t, $IR_{i,t}$ is the interest rate of country i in the year t, $FL_{i,t}$ is the financial liberalization of country i in the year t, $TL_{i,t}$ is the trade liberalization of country i in the year t, $GI_{i,t}$ is the governance infrastructure of country i in the year t and $\varepsilon_{i,t}$ is the error term of the model.

However, the four models are constructed to explore the determinants of the banking sector development using four indicators of the BSD with following $IM_{i,t}$, $BA_{i,t}$, $PF_{i,t}$ and $LQ_{i,t}$.

3.6.1 Estimation Technique

The endogeneity in the right hand side regresses and resulting estimate bias would be a major issue that should be considered when selecting an appropriate estimation technique for the formula 3.10 above. Traditional panel estimation methods would be biased and inconsistent, because the lagged effect of BSD is correlated with the error

term. The first difference-GMM estimator with instrumental variables suggested by Arellano and Bond (1991) would be an alternative estimation method in this. Under the assumptions that no serial correlation in error term and weakly exogenous explanatory variables, the first difference-GMM estimator uses GMM-type moment conditions and standard moment conditions as instrumental variables to get rid of endogeneity problem. Further, Arellano and Bond (1991) suggested transforming the model into first differences to eliminate the fixed effects and estimate it with the two-step GMM estimator, which provides theoretically more efficient estimates.

However, Arellano and Bover (1995) and Blundell and Bond (1998) indicate that when the autoregressive process is highly persistence the lagged levels are weak instruments in two-step GMM estimator. Hence, to overcome this issue Blundell and Bond (1998) introduced the System-GMM estimator that combines the moment conditions for the differenced model with those for the levels model. Therefore, the two-step System-GMM estimator is used as the estimation technique in this study. However, if the coefficient effect of the lagged levels is highly persistence, Arellano-Bond GMM estimator is suggested. Post estimation tests of Sargan-test, and Arellano and Bond serial correlation tests are then applied to test the validity of instruments and the serial correlation of the disturbances, respectively.

3.7 Structural Equation Model

The basic framework for the structural model consists of M (m = 1….5) structural relationships. This includes a cross-country growth equation and another four channel equations for each of the channels discussed previously. The structural relationship is measured over a T time period (from 2006 to 2014) for N (eighteen) countries (i = 1….N). Thus, a set of T*M equations can be identified for the most unrestricted form of the model as given in Formula 3.11.

$$\beta_{11}^{tm} y_{i11} + \ldots + \beta_{T1}^{tm} y_{iT1} + \ldots + \beta_{1M}^{tm} y_{i1M} + \ldots + \beta_{TM}^{tm} y_{iTM} + \lambda_{11}^{tm} x_{i11} + \ldots + \lambda_{T1}^{tm} x_{iT1} + \ldots + \lambda_{1L}^{tm} x_{i1L} + \ldots + \lambda_{TL}^{tm} x_{iTL} = \varepsilon_i^{tm} \quad (3.11)$$

Where, all the superscripts indicate equations and subscripts indicate variables. However, as the above model is far too general, following Tavares and Wacziarg

(2001) several restrictions are introduced. To ensure the model is not dynamic, the non-contemporary coefficients are made equal to zero ($\beta_{sm}^{tm} = \lambda_{sm}^{tm} = 0$ for all s different from t). A cross-time parameter restriction is imposed to equalize coefficients across time, that is; $\beta_{tm}^{tm} = \beta_{tm}^{sm}$ *and* $\lambda_{tm}^{tm} = \lambda_{tm}^{sm}$. To specifically identify the m[th] variable as the dependent variable for the m[th] equation β_m^m is equalled to one. According to the restrictions imposed so far, each set of T equations for one of the available M relationships would be given in Formula 3.12.

$$y_{im} = \varepsilon_i^m - \beta_1^m y_{i1} - ... - \beta_M^m y_{iM} - \lambda_1^m x_{i1} - ... - \lambda_L^m x_{iL} \qquad (3.12)$$

Where, y_{im}, x_{il}, and ε_i^m are the (T x 1) vectors that stack each endogenous variable m = 1….M, each exogenous variable l = 1….L, and each disturbance m = 1.…M, over the T time periods. Thus Formula 3.12 depicts the properties of panel data model, where the data for each of the individual country have been stacked over time.

The joint estimation of above system of equations would generate a large covariance matrix for the ε_i^m errors. This can be stacked into a vector of ε_i where, $E(\varepsilon_i) = 0$ and $E(\varepsilon_i \varepsilon_i') = \sum$. Cross-period and cross-equation error covariance of the system are represented by the off-diagonal elements of $\sum$. Allowing these off diagonal elements to be differ from zero would ensure the efficiency of the estimates (Wacziarg, 2001). Further, differing this cross-period error covariance from zero is similar to allowing the error terms to represent country specific effects which are independent from the right-hand side variables (Tavares & Wacziarg, 2001; and Wacziarg, 2001). Thus, the system would form an approach equivalent to the random effects model.

3.7.1 Three Stage Least Square Estimation

The possible parameter biasness is a major concern in the above structural model as several endogenous variables appear in the right-hand side of the structural equation. Therefore, these (T*M) equations are jointly estimated by using three-stage least

squares (3SLS) estimator, introduced by Zellner and Theil (1962). 3SLS estimator combines the properties of two-stage least squares (2SLS) and seemingly unrelated regression (SUR) estimators. Thus, it is an instrumental variable-generalized least squares (IV-GLS) technique that guarantees consistency and efficiency through instrumenting and appropriate weighting. The robustness of the estimation method is tested by employing SUR estimator, which is considered as less consistent but highly efficient. However, it may provide a good indication of the model's robustness.

3.7.2 Model Specifications for Direct and Indirect effect of BSD on EG

Following cross-country growth literature (Greenwood & Jovanovic, 1990; Bencivenga & Smith; 1991; and Gründler & Weitzel, 2013), an AK model (Romer, 1990) is developed as the growth equation, which includes the indicator of the banking sector development as intermediation (IM), broad access (BA), profitability (PF) and Liquidity (LQ) and which are separately proxied by private credit by deposit money bank to GDP, commercial bank branches per 100,000 adults, banks return on assets and bank liquid assets to deposit. In addition to that four channel variables of physical investment (PI), human capital (HC), technology (TC) and governance infrastructure (GI) are included. Then the control variables of government consumption (GCE), initial income (II), inflation rate (IFR), average growth of population (AGRP), foreign direct investment (FDI), trade openness (TO) and natural resource rent (NRR) are included. However, all the channel variables appear jointly in the growth regression in Formula 3.13, any effect of BSDs on growth will be reflected through these channel variables.

$$EG_{i,t} = \beta_0^Y + \beta_1^Y BSD_{i,t} + \beta_2^Y PI_{i,t} + \beta_3^Y HC_{i,t} + \beta_4^Y TC_{i,t} + \beta_5^Y GI_{i,t} + \beta_6^Y GCE_{i,t} + \beta_7^Y II_{i,t} + \beta_8^Y IFR_{i,t} + \beta_9^Y AGRP_{i,t} + \beta_{10}^Y FDI_{i,t} + \beta_{11}^Y TO_{i,t} + \beta_{12}^Y NRR_{i,t} + \varepsilon_{i,t} \quad (3.13)$$

Growth equation with four different indicators of BSDs are derived by four equations applying the four indicators of $IM_{i,t}$, $BA_{i,t}$, $PF_{i,t}$ and $LQ_{i,t}$.

Then the mediate variable which are found from the empirical literature on endogenous growth and others are $PI_{i,t}$ the physical investment is measured by a proxy variable of gross fixed capital formation, $TC_{i,t}$ the technology is measured by a proxy variable of share of manufactured export to merchandise exports, $HC_{i,t}$ the human capital By a proxy variable of average secondary and tertiary education attainment for the population Age 25 or Over and $GI_{i,t}$ the Governance Infrastructure is measured by the first principal component of the six Governance Indicators estimates. Globerman and Shapiro (2002), an aggregate measure of these is obtained by estimating their first principal component, which would efficiently represent the institutional excellence.

The other part of the equation is confined with the control variables derived from the literature review and which are the $II_{i,t}$ initial income is proxied by the log of the per capita GDP, $FDI_{i,t}$ foreign direct investment, $IFR_{i,t}$ inflation rate, $TO_{i,t}$ trade openness, $AGRP_{i,t}$ Average growth rate of population, $NRR_{i,t}$ natural resources rent and $GCE_{i,t}$ government consumption expenditure.

Model specifications for the four channel equations are determined based on the empirical literature. Because, several other channel variables in the system may appear on the right hand side of channel equations, each of these equations suffers from endogeneity. Thus, maintaining the rank and order conditions of Greene (1993), several exogenous variables are introduced to the system as instrumental/control variables. Same as the growth equations, the four indicators of the BSDs are applied in each channel variables. Further IM , BA , PF and LQ the main independent variables in these four equations. In order to isolate the effect of such variables of the BSD, several control variables (CV) are also introduced based on the literature review as in formulas 3.14, 3.15, 3.16 and 3.17.

$$PI_{i,t} = \beta_0^{PI} + \gamma_1^{PI} BSD_{i,t} + \sum_{l=1}^{7} \beta_l^{PI} CV_{i,t}^{PI} + \varepsilon_{i,t}^{PI} \quad (3.14)$$

$$HC_{i,t} = \beta_0^{HC} + \gamma_1^{HC} BSD_{i,t} + \sum_{l=1}^{6} \beta_l^{HC} CV_{i,t}^{HC} + \varepsilon_{i,t}^{HC} \quad (3.15)$$

$$TC_{i,t} = \beta_0^{TC} + \gamma_1^{TC} BSD_{i,t} + \sum_{l=1}^{10} \beta_l^{TC} CV_{i,t}^{TC} + \varepsilon_{i,t}^{TC} \quad (3.16)$$

$$NGVI_{i,t} = \beta_0^{NGVI} + \gamma_1^{NGVI} BSD_{i,t} + \sum_{l=1}^{3} \beta_l^{NGVI} CV_{i,t}^{NGVI} + \varepsilon_{i,t}^{NGVI} \quad (3.17)$$

Therefore, the channel variables can be illustrated according to the relevant indicators of the BSD indicators of intermedeation (IM), broad access (BA), profitability (PF) and Liquidity (LQ).

Control variables to the formula of Physical Investment (PI) are: initial income (II), government consumption expenditure (GCE), Democracy Index (DMI), trade openness (TO), foreign direct investment (FDI), Rule of Law (ROL) and inflation rate (IFR).

Control variables to the formula of Human Capital (HC) are: technology (TC), initial income (II), government consumption expenditure (GCE), Rule of Law (ROL) and population aging (PAG) and trade openness (TO)

Control variables to the formula of Technology (TC) are: human capital (HC), initial income (II), government consumption expenditure (GCE), inflation rate (IFR), trade openness (TO), real interest rate (RIR), Rule of Law (ROL), adolescent fertility rate (AFR), Terms of Trade (TOT) and labour force with primary education (PELF)

Control variables to the formula of Governance Infrastructure are: initial income (II), government consumption expenditure (GCE) and primary education enrolment (PEE).

3.8 Estimating the Channel Effect

In estimating the indirect effect or the channel effect, a procedure developed by Sobel (1982), which is commonly known as Sobel test, is employed in this study. Herein, the interested parameters are the ones that describe the effect of BSDs on each of the channel variables (γ_1^{PI} , γ_1^{TC}, γ_1^{HC} and γ_1^{GVI}) and the parameters that describe the effect of each channel variable on growth (β_1^Y, β_2^Y, β_3^Y and β_4^Y). Then, the product of the corresponding parameters on a particular channel path will provide the respective channel effect. When testing the statistical significance of the channel effects, the standard error of $\gamma_1^m \beta_m^Y$ (S_{ab}) can be obtained from the following Formula 3.18 (Sobel, 1982);

$$S_{ab} = \sqrt{b^2 S_a^2 + a^2 S_b^2 + S_a^2 S_b^2} \qquad (3.18)$$

Where, S_{ab} is the standard error of the $\gamma_1^m \beta_m^Y$. b indicates β_m^Y. a indicates γ_1^m. S_a^2 is the variance of the equation that describe the effect of BSD on channel variable. S_b^2 is the variance of the equation that describe the effect of channel variable on growth.

CHAPTER FOUR

EXPLANATORY DATA ANALYSIS

4.1 Introduction

This chapter comprises the visual presentation of the determinants of the BSD. Initially the line charts explain the behaviour of the determinants of the BSD. Then the Principal component analysis is illustrated to explore a new variable for the governance infrastructure which will use in the study. Furthermore, descriptive statistics of the panel data indicates the basic features and behaviour of the variables. Then, the correlation analysis is done to explore the strength and direction of the association between variables. Since, this would give a comprehensive picture of the variable to achieve the objectives of the study.

4.2 Behaviour of the Determinants of the Banking Sector Development

The behaviour of the determinants of the banking sector development provides an important picture. As per the literature review, there are five determinants of the banking sector development which depicts the global and selected countries behaviour.

4.2.1 Real Gross Domestic Product Growth (RGDPG)

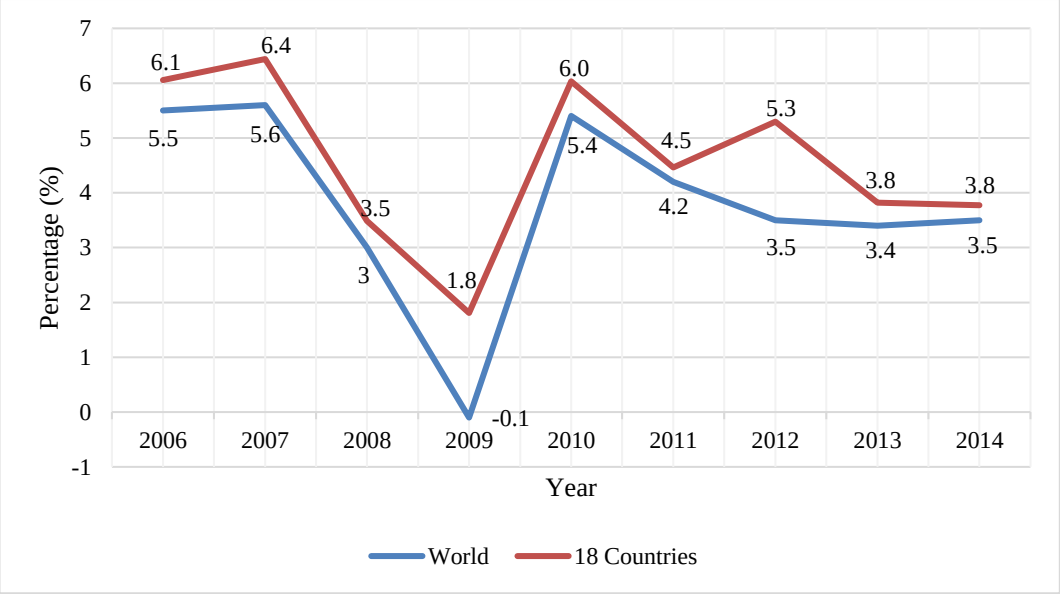

Figure 4.1: Real Gross Domestic Product Growth in the World versus 18 Countries

Source: World Bank Group (2016)

The figure 4.1 shows the RGDPG of the World and the selected 18 countries and it is the proxy variable for the economic growth (EG). According to the figure, it represents the data for the period from 2006 to 2014. Furthermore, it depicts that there was a frequent fluctuations of RGDPG during such period and which has significantly went down in the year 2007 globally and selected countries. The RGDPG of the selected countries has recorded the higher growth comparatively to the global performances. However, the recorded economic growth of 5.5 percent in year 2007 has come down to -0.1 percent in year 2009 in global scenario. It evidences that the global financial crisis has caused to the economic meltdown during the period of year 2006 to year 2010 with parallel to the selected countries performances. Then, the figure shows that again it has reached to the 5.4 percent growth in year 2010. Subsequently, it has again gradually come down to 3.4 percent in year 2013 and come up to 3.5 percent in year 2014.

However, in the year of 2009, the average RGDPG of 18 countries recorded at 1.8 percent which is more than the global scenario. This is due to the most crucial time during the financial crisis. It evidences that selected countries have recorded the economic growth of 5.3 percent in the year 2012, while the global economic growth was 3.5 percent showing an opposite trend.

4.2.2 Real Interest Rate (RIR)

The Real Interest Rate (RIR) is another determinant of the banking sector development and which is the proxy variable for the interest rate (IR). Figure 4.2 indicates the behaviour of the average real interest rate between the World (including 157 countries) and 18 countries.

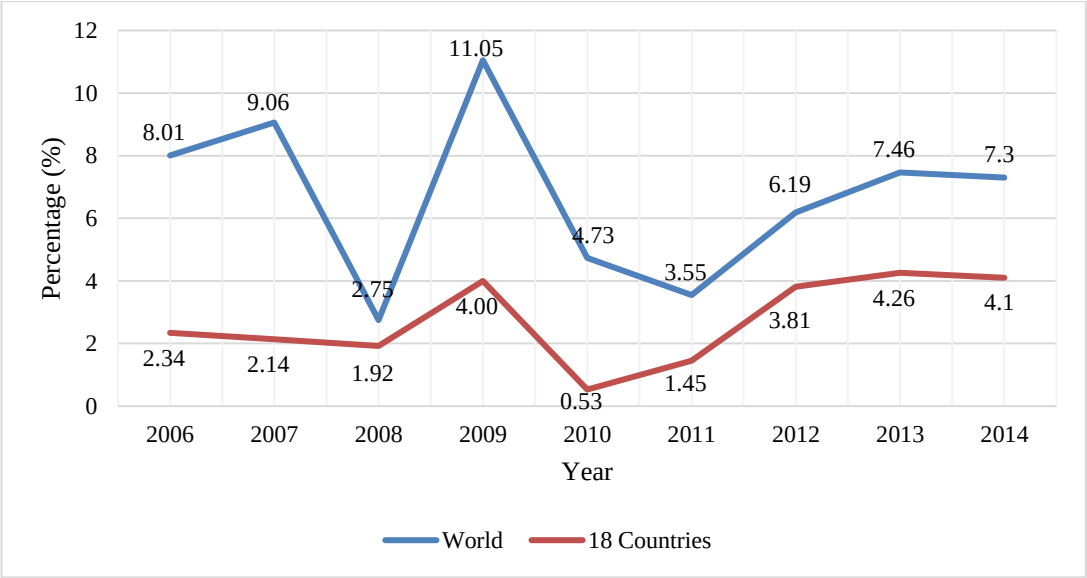

Figure 4.2: Average Real Interest Rate in the World versus Selected 18 Countries
Source: World Bank Group (2016)

The figure indicates that average highest real interest rate of the world has reached to 11.05% in the year 2009 while the selected countries recorded a far behind rate at 4%. However, it indicates clearly the financial crisis has greatly affected to the selected countries than global. According to the results, the 18 countries have reached to the lowest rate in the year 2010 at 0.53% when compare to the global scenario which has reached to at 4.73%. More precisely figure depicts that after the year 2011, the selected countries have recorded the real interest rates among parallel to the behaviour of the world.

After financial crisis taken place, the global real interest rate has reached to lowest rate at 2.75% in year 2009. The IMF (2014) indicated that steady increase in income growth of emerging markets, demand for safe assets increased and persistent decline in investment rates in advanced economics accounted for the declining of real interest rate.

4.2.3 Trade Openness (TO)

Figure 4.3 shows the behaviour of the Trade Openness of the World and 18 countries during the period of year 2006 to 2014. TO is the proxy for the trade liberalization (TL).

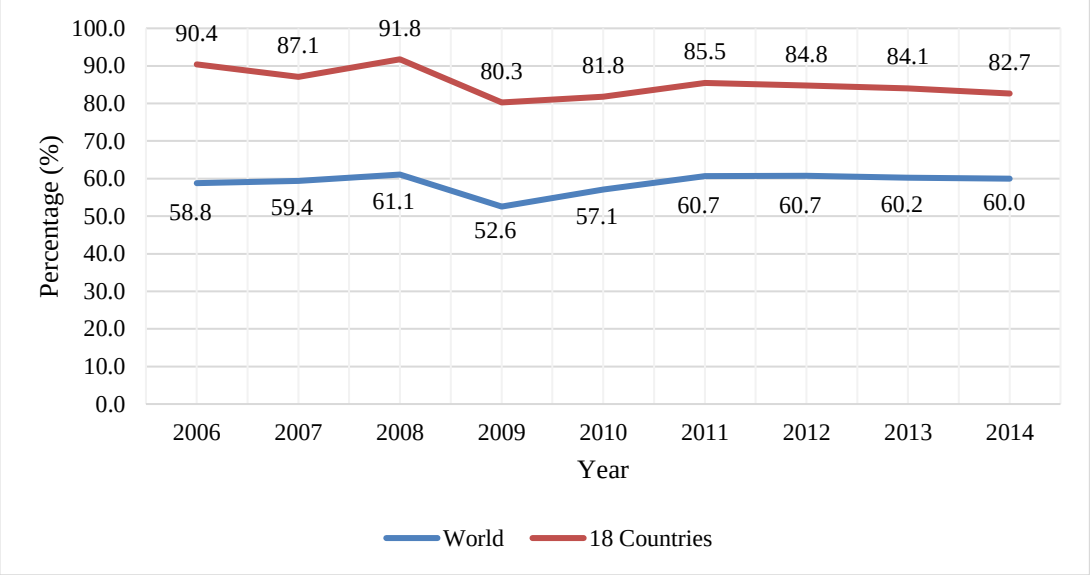

Figure 4.3: Trade Openness in the World versus 18 Countries

Source: World Bank Group (2016)

According to the figure, World's trade openness has come down in the year 2009 recording its share to GDP at 52.6. However, the international trade of 18 countries and World have followed a parallel pattern during the period without intersecting performances of each line. Throughout the period, the selected countries have captured higher TO values than the global performances. Therefore, the figure showed that the impact of the financial crisis during the period of 2008 to 2009 was same for the selected countries and global. It further highlights that the international trade of the selected countries may contribute to the global trade development.

4.2.4 Foreign Direct Investment (FDI)

The Figure 4.4 indicates that the net foreign direct investment to GDP of the World and selected 18 countries. This proxy variable represents the financial liberalization (FL). Not like RGDPG, RIR and TO, FDI of the global results and 18 Countries have indicated its convergence during the period of 2006 to 2014.

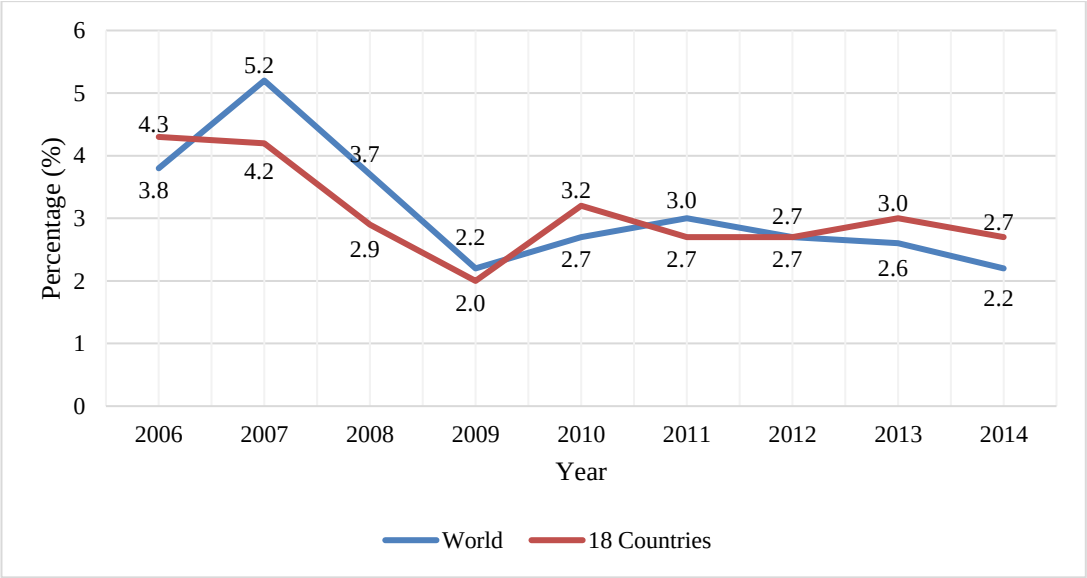

Figure 4.4: Net Foreign Direct Investment in the World versus 18 Countries

Source: World Bank Group (2016)

Figure indicates that both global and 18 countries have drastically dropped down to 2.2 and 2.0 respectively in the year 2009 and the reason may be the negative influence of the financial crisis. However, after the crisis time, FDIs of 18 countries has come up to the higher level at 3.2 than the global results of 2.7 in year 2010. Then, eventually, the results of FDIs of both global and selected countries performed convergent manner.

4.2.5 New Governance Indicator (NGVI)

Governance indicators are confined with six indicators including Control of Corruption (CC), Government Effectiveness (GE), Political stability and Absence of violence (PA), Regulatory Quality (RQ), Rule of Law (RL) and Voice and Accountability (VA). Figure 4.5 shows the behaviour of the average governance indicators among the 18 countries during the period of 2006 to 2014 which is the proxy variable for the governance infrastructure (GI).

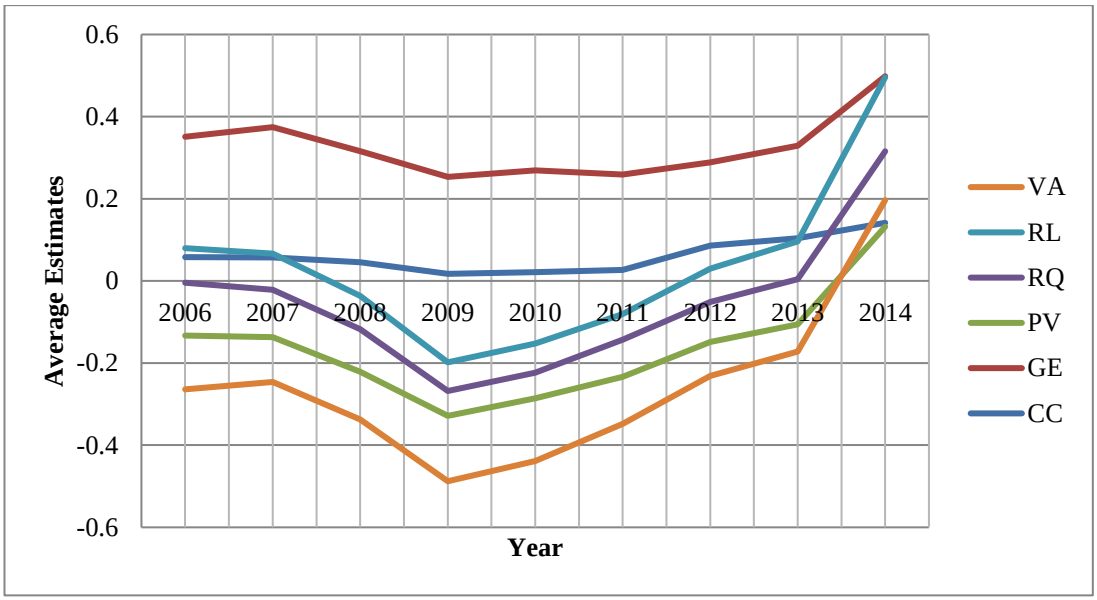

Figure 4.5: Average Estimates of Governance Infrastructure Indicators for the 18 Countries

Source: World Bank Group (2016)

According to the figure indicated, CC and GE has recorded average estimates above the 0 during the period of 2004 to 2016. However, indicators of RL, PV and VA have been received negative estimates inception of year 2006, until it reach to positive estimates in year 2014. The figure indicates that, satisfactorily all the indicators have earned positive estimates in year 2014. Furthermore, the figure depicts that from the year 2007 all the estimates recorded a downward trend until year 2009.

Then the following Figure 4.6 indicates the new governance infrastructure indicator derived from the first principal component using above six governance indicators. The figure indicates that more or less same pattern compared to the average of the six governance indicators of the selected 18 countries.

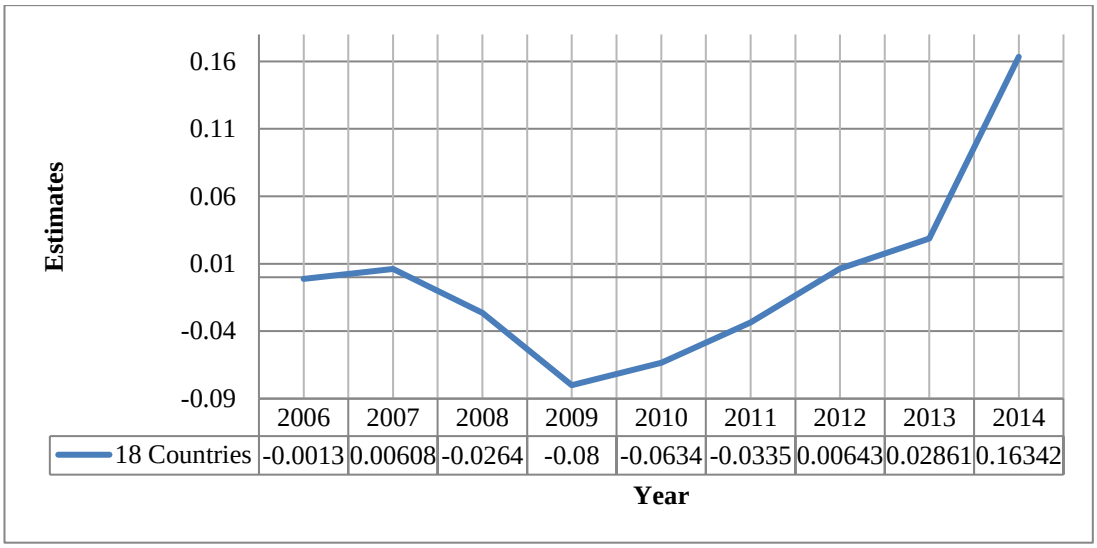

Figure 4.6: New Governance Indicator for the 18 Countries

Source: World Bank Group (2016)

Figure indicates that estimates of the NGVI of the selected countries have shown a series fall down from year 2007 to 2009 recording the estimates of 0.006 and -0.08 respectively. However, the figure further shows that it has come again to the more or less same estimates which were in 2007recorded result of 0.0064 in the year of 2012. It can be assumed that the reason behind the downfall of the estimates for the negative results may have a relationship with the financial crisis taken place during such periods. However, after the year 2012, estimates have rose marking a significant result at 0.1634 estimates in the year of 2014. It seems that the uncertain environment of the global has been recovering to favourable position in regarding to the good governance.

4.3 Principal Component Analysis for Governance Indicators

Results of the correlation for CC, GE, PA, RQ, RL and VA are shown in Table 4.1. The study constructs the principal component indices for the governance infrastructure using first principal component since, which has accounted for the maximum variance of the original system.

Table 4.1: Correlation among the Indicators of Governance Infrastructure

Indicators	CC	GE	PA	RQ	RL	VA
CC	1.000					
GE	0.954**	1.000				
PA	0.832**	0.790**	1.000			
RQ	0.943**	0.977**	0.719**	1.000		
RL	0.967**	0.955**	0.823**	0.948**	1.000	
VA	0.726**	0.713**	0.462**	0.774**	0.791**	1.000

**Correlation is significant at the 0.01 level (2-Tailed)

The results show that the indicators of the governance infrastructure CC, GE, PA, RQ, RL and VA are highly correlated each other and the coefficient of the results confirm that correlation among indicators are significantly difference from zero. Since, correlation results fulfil the initial requirement of higher correlation among the variables to construct a principal component.

Then the results of the analysis of Eigenvalues of the correlation matrix are shown in below Table 4.2.

Table 4.2: Eigenvalues of the Correlation Matrix

Eigenvalue	5.1592	0.5540	0.2016	0.0462	0.0249	0.0141
Proportion	0.860	0.092	0.034	0.008	0.004	0.002
Cumulative	0.860	0.952	0.986	0.994	0.998	1.000

Result indicates that the eigenvalues are greater than 1 only for the first dimension of the six variables. Since the initial 6 dimension system can be reduced to one dimension system. Therefore, this results able to capture 86% of the variability of the initial system. Furthermore, the cumulative percentage also becomes the same value being the first and only component records the eigenvalue greater than 1 which is 5.1592. Being the PC1 represents the first dimension of the output and which

accounts for 86% of the initial variability of the system, so there is no need to further reduce the complexity of the dataset.

Furthermore, using a Scree plot, it can be clearly identified that PC1 has eigenvalues more than 1. It is given in following Figure 4.10. According to the eigenvalues of the first component, it can be determined to retain in the given solution.

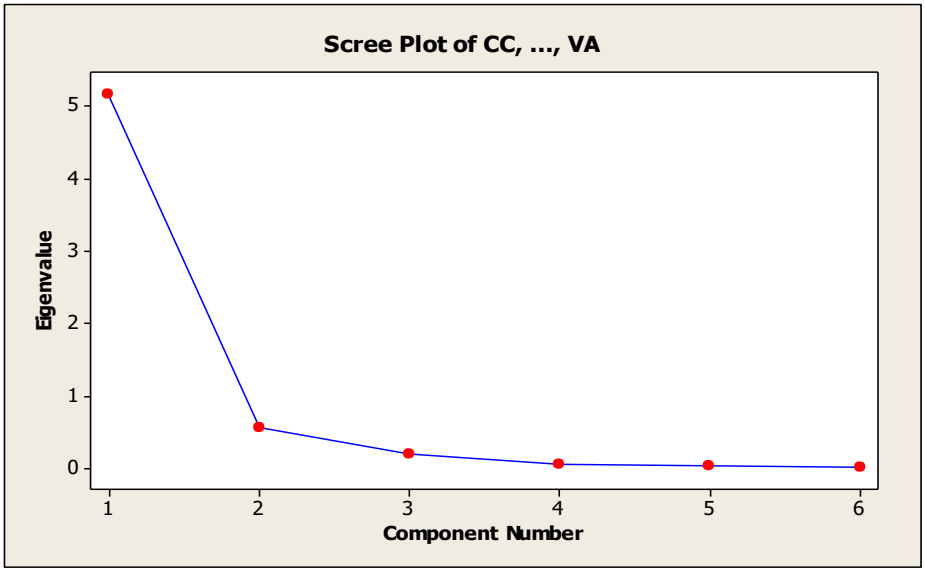

Figure 4.7: Scree Plot of the Initial Solution of Governance Infrastructures

The Eigenvalues of the correlation matrix and scree plot confirm to select the PC1. Since the Eigenscores of the PC1 to PC6 are given in below Table 4.3.

Table 4.3: Eigenscores of the PC1 to PC6

Variable	PC1	PC2	PC3	PC4	PC5	PC6
CC	0.431	-0.102	0.107	0.785	-0.402	0.122
GE	0.429	-0.061	0.412	-0.386	0.046	0.701
PA	0.367	-0.651	-0.576	-0.277	-0.161	-0.084
RQ	0.427	0.113	0.455	-0.302	-0.243	-0.669
RL	0.436	0.000	-0.047	0.230	0.853	-0.168
VA	0.352	0.741	-0.527	-0.120	-0.156	0.102

According to the results, PCI represents the only one dimension which has recorded Eigenvalue more than 1 and which is the optimum solution. Since, relevant

Eigenscores of the PC1 can be used to forecast the New Governance Infrastructure Indicator.

Furthermore, the correlation values can be derived to confirm the correlation of PC1 which estimates the correlation between each of the six variables and the estimates components. The correlation values can be estimated based on the given Formula 4.1 in relation to the each Eigenscores of the relevant variables.

$$Correlation = \sqrt{Eigenvalue}\ of\ the\ dimension\ which\ is\ greater\ than\ 1$$
X Each Eigenscore of the elevant variables in the PC (4.1)

As a thumb rule, the correlation more than 0.4 can be considered as appropriate in selecting the variables in following Table 4.4.

Table 4.4: Correlation Values of the PC1

Variable	PC1
CC	0.978
GE	0.974
PA	0.833
RQ	0.969
RL	0.990
VA	0.799

The results in the Table 4.2 and 4.3 also clearly indicate that CC, GE, PA, RQ, RL and VA have the higher the chance to cluster for PC1.

Therefore the New variable on Governance Infrastructure can be expressed based on the PC1 using the Standardized variables of the original six indicators of the governance infrastructures. The following Formula 4.2 for NGVI is given below.

$$NGVI = PC1_{CC}\ X\ \text{CC} + PC1_{GE}\ X\ \text{GE} + PC1_{PA}\ X\ \text{PA} + PC1_{RQ}\ X\ \text{RQ} +$$
$$PC1_{RL}\ X\ \text{RL} + PC1_{VA}\ X\ \text{VA} \quad (4.2)$$

Where, *NGVI* is the first principal component represents the new governance indicator, $PC1_{CC}$ is the eigenscore of the Control of Corruption indicator in principal component 1 and CC is the estimates for the Control of Corruption indicator, $PC1_{GE}$

is the eigenscore of the Government Effectiveness indicator in principal component 1 and GE is the estimates for the Government Effectiveness indicator, $PC1_{PA}$ is the eigenscore of the Political Stability and Absence of violence indicator in principal component 1 and PA is the estimates for the Political Stability and Absence of violence indicator, $PC1_{RQ}$ is the eigenscore of the Regulatory Quality indicator in principal component 1 and RQ is the estimates for the Regulatory Quality indicator, $PC1_{RL}$ is the eigenscore of the Rule of Law indicator in principal component 1 and RL is the estimates for the Rule of Law indicator, $PC1_{VA}$ is the eigenscore of the Voice and Accountability indicator in principal component 1 and VA is the estimates for the Voice and Accountability indicator.

Thus, the new governance indicator can be estimated based on the eigenscores of the PC1 as follows in Formula,

$$NGVI = 0.438CC + 0.429GE + 0.367PA + 0.427RQ + 0.436RL + 0.352VA \quad (4.3)$$

4.4 Descriptive Statistics for the Determinants and Indicator of the Banking Sector Development

Results of the descriptive statistics for determinate of the BSD are shown in Table 4.5.

Table 4.5: Descriptive Statistics of the Determinants of the Banking Sector Development

Variable		Mean	Std. Dev	Min	Max
EG	Overall	4.54	3.64	-7.82	15.24
	Between		2.48	0.49	9.89
	Within		2.73	-6.43	13.97
IR	Overall	2.77	4.07	-8.58	17.47
	Between		2.11	-0.57	8.00
	Within		3.51	-13.82	16.40
TL	Overall	85.37	84.03	24.49	439.65
	Between		85.41	28.86	384.91
	Within		11.33	49.55	140.11
FL	Overall	3.07	4.53	-0.07	26.52
	Between		4.26	0.20	19.46
	Within		1.80	-10.05	10.12
GI	Overall	0.000	2.27	-3.77	3.62
	Between		2.33	-3.51	3.56
	Within		0.14	-0.37	0.47

Results include the panel descriptive statistics of economic growth (EG), interest rate (IR), trade liberalization (TL), financial liberalization (FL) and governance infrastructure (GI) for the 18 countries.

According to the results, the overall mean of EG of the countries indicates that reasonably average at 4.54% spreading -7.82% to 15.24% with higher variability which is proxied by the real gross domestic product growth (RGDPG). This is the measurement on how does the economic performance of the countries. Since, the standard deviation, 3.64% indicates a moderate variability of EG. According to the results, the economic growth of the Afghanistan in 2009 and Japan in 2009 respect to the maximum and minimum values. However the global economic downfall between the years of 2007 to 2010 may has influenced to the higher variability of the economic performances. The variability of the EG between the countries at 2.48%, while the within variability of the EG of the countries shows at 2.73%. However

results indicate that the variation in EG across countries is nearly equal to that observed within country overtime.

The mean IR of the countries records at 2.77% associated standard deviation of 4.07% and this is measured by the real interest rate (RIR). During the period, RIR of the countries lies between the minimum of -8.58% and the maximum of 17.47%. In here the real interest rate gives the idea of investors' and savers' net receive after the inflation. However both lowest and highest IR of countries recorded by the Afghanistan during the years 2007 and 2009. When the variability of IR of between the countries at 2.11%, the within variability is recorded at somewhat higher rate at 3.51%. Since the spread of the IR level is higher within the countries with the minimum of -13.82% and maximum of 16.40%. It seems that the investors have suffered much from the inflation within the countries and more uncertainty was existed. However the global financial crisis has become a reason for overall countries during the period between years 2007 to 2010.

Trade openness (TO) be a measurement for the trade liberalization (TL) and which accounts for total imports and exports to the GDP by a country. Average of the TL records at 85.37spreading 24.49 to 439.65 for selected countries and average value indicates more favourable rate. The variability of the TL of the countries at 84.03 which is very higher in regards to the derived results. However the selected countries are represented by the most developed and developing nations except to under developed countries. Since, Japan recorded the lowest TO as a share of their GDP in 2009 while Singapore recorded the highest value of TO on their GDP in 2008. The variability of the TL between the countries records at 85.41 and this would also indicates that the diversity of the countries' international trade. When compare to the variability across countries, countries within the over the time of TL at 11.32. This indicates that sum of imports and exports of the country level are varies by lower amount compared to between the countries. However, it seems that international trade has brought the diverse range of economic benefits to the selected countries, though there was the financial crisis during the period

The financial liberalization (FL) is represented by the Foreign Direct Investment (FDI). The average of the FL for selected countries records at 3.06. Then the mean results of FL indicate that the average of FDIs of the selected countries is recorded at 3.07. However, the variability of FL at 4.55 and the minimum and maximum values are lied from -0.07 to 27.52. This indicates that the net results of the investments made by a company or an individual in one country in business interest in another country as a share of GDP has become diverse among the countries. Nepal recorded the lowest FDI as -0.07 on GDP in 2006 while Singapore recorded the highest value of 26.52 on its GDP in 2007. The variability of FL of between countries indicates the share of 5.28. Further, the minimum of 0.21 and maximum of 19.57 are more favourable when compared to the overall and within FL of the countries. However the variability of the overall countries and across the countries follows the more equal results. But the variability of the FL of within overtime of the countries records at 1.81 and which is quite low when compared to others.

Finally the mean of the NGVI indicates at 0.0000 estimates which are derived from the six variables of the governance indicators and which is proxied for governance infrastructure. However the standard deviation records at 2.27 estimates for the selected countries. According to the results, Afghanistan has received the lowest estimates of -3.78 when Australia received the highest estimate of 3.63. The variability for the GI in within level also records quite a same value to the overall performance at 2.32 estimates. This indicates that the variability of the GI are follows same results for both overall countries and between estimation. Then the variability for the GI in within estimates records at 0.139 compared to the lower variability. Results depicts that the estimates received for the Control of Corruption, Government Effectiveness, Political stability and Absence of violence, Regulatory Quality, Rule of Law and Voice and Accountability for the selected countries during the period of period of year 2007 to 2010 have resulted due to the lower governance practices in some countries.

The following Table 4.6 shows the results of the descriptive statistics for the indicators of the BSD. There are four indicators including intermediation (IM), broad

access (BA), profitability (PF) and liquidity (LQ). These are proxied by the private credit by deposit money bank to GDP (PCDMB), commercial bank branches per 100,000 adults (CBB), banks return on assets (BROA) and banks liquid assets to deposit (BLAD) respectively.

Table 4.6: Descriptive Statistics of the Indicators of the Banking Sector Development

Variable		Mean	Std. Dev	Min	Max
IM	Overall	70.65	44.15	3.92	202.19
	Between		44.31	6.19	171.75
	Within		9.11	43.86	107.70
BA	Overall	16.18	10.65	0.96	38.47
	Between		10.79	1.97	35.51
	Within		1.67	10.64	22.85
PF	Overall	0.98	0.82	-2.25	2.89
	Between		0.55	0.17	1.94
	Within		0.61	-1.58	2.98
LQ	Overall	24.81	13.93	5.44	70.89
	Between		13.18	9.40	56.73
	Within		5.38	10.07	49.33

Results indicate that, average IM of the selected countries is 70.65. However the IM between from 3.92 to 202.19 indicating a larger spreads in the selected countries. The standard deviation also indicates a higher dispersion among the variable at 44.15. This is a commonly used indicator measured by the PCDMB and it indicates the higher variability of the banking sector in selected countries. According to the results, Afghanistan has recorded the lowest PCDMB to GDP by 3.92 in 2014 while United Kingdom recorded the highest value by 202.19 in 2009. However the between variability of the IM is recorded as 44.31 same as to the overall results and which also a higher result. Then within variability of the IM is at 9.11 compared to others. Thus, the results indicate that variation in banking intermediation within over the time is much lower than the variation of such indicator across the countries. These results depict according to the banking system of the countries, level of intermediation is decided.

Then the mean of BA indicates at the 16.18 branches associated with the standard deviation of 10.65 branches. This is a very useful indicator on banking access which

has been recognized by the banking industry. However the minimum and maximum commercial bank branches are varies from 0.96 to 38.47 branches among the countries. According to the results, minimum bank branches are recorded by the Afghanistan approximately 1 branch in 2006 while maximum bank facilities show by the Russia at 38 branches in 2013. However the dispersion of broad access (BA) between the countries records at 10.79 branches spreading from 1.97 branches to 35.51 branches. When compared to the dispersion between countries, dispersion within the time is at quite lower value of 1.67 branches. Since, the results indicate that variation in broad access within over time much lower than the broad access across countries in selected countries.

Average of PF records at 0.98 spreads between -2.25 to 2.89 recording a lower variability of 0.82 and which is measured by the BROA. However, the Bangladesh records the lowest BROA in their banking sector as the -2.25 in 2006 while the Malaysia records its highest of 2.90 in 2011 among the countries. However, the banks return on assets is a most important proxy on banks' profitability (PF). However, the dispersion of the BROA for the between countries is 0.55 while the within the time period records 0.61 respectively. When consider the banks' profitability, variation in BROA across countries are quite lower than the within a country over time. Thus, the dispersion of the PF over time indicates that the profitability has been differently behaved according to the banking industry and the entities operations. This may have been resulted by the impact of the global financial crisis.

Finally, the mean of LQ is at the 24.81 associated with the standard deviation of 13.93. The minimum and maximum of LQ in the selected countries are recorded 5.44 and 70.89 respectively. The banks' liquid asset to deposit is the proxy on banks' liquidity (LQ) and which is a more important indicator in the banking sector. However, the Korea and Afghanistan are recorded such minimum and maximum values respective to the years 2009 and 2006. The variability of the LQ of between countries is recorded at 13.18 which are similar to the variability of overall countries. However the variability of the ST within over time is at 5.38. This indicates that the

dispersion of the LQ in relation to the across countries are higher and this may reason the nature of the banking sectors in the different countries in the panel. Since, much higher stocks of banks' liquid assets to deposit are recorded in the developed countries. Thus, the variability within over time is not much compared to between effects and thus the special scenarios happened during the period not much impacted to the behaviour of the variable.

4.5 Correlation Analysis between Indicators and Determinants of the Banking Sector Development

Results of the correlation analysis between indicators of the BSD and determinants are shown in below Table 4.7. The determinants of the banking sector developments are identified with five variables namely EG, IR, TL, FL and GI. The correlation test is done by the Pearson correlation.

Results indicate that the association between EG and indicators of BSDs shows the mix results. There is a negative correlation between EG and IM ($r = -0.293$, $p = 0.000$) and BA ($r = -0.487$, $p = 0.000$). Both correlation coefficient shows that correlations are significantly difference from zero.

IR shows association between one indicators of BSDs, which is also a negative correlation with BA ($r = -0.179$, $p = 0.023$). The correlation coefficient of the relationship between IR and BA confirms that correlation between IR and BA are significantly difference from zero.

When concern the correlation coefficient results of TL and BSDs indicators, both positive and negative association is existed with two indicators. According to results, there is a positive association between TL and IM ($r = 0.242$, $p = 0.002$) while the negative association between TL and BA ($r = -0.256$, $p = 0.001$). However, both coefficient results confirm that correlation between TL and such variables are significantly difference from zero.

Table 4.7: Correlation Results of the Indicators and Determinants of the Banking Sector Development

Variable	IM	BA	PF	LQ	EG	IR	IL	FL	NGVI
IM	1.000								
BA	0.335**	1.000							
PF	-0.203**	-0.119	1.000						
LQ	-0.086	-0.008	0.058	1.000					
EG	-0.290**	-0.492**	0.204**	-0.025	1.000				
IR	0.115	-0.174*	0.005	0.008	-0.044	1.000			
TL	0.242**	-0.256**	0.145	0.070	0.084	0.040	1.000		
FL	0.259**	-0.073	0.116	0.131	0.192*	0.003	0.804*	1.000	
NGVI	0.595**	0.544**	-0.016	-0.072	-0.336**	-0.134	0.307**	0.424**	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

There is a positive association between FL and IM (r = 0.259, p = 0.001) and the coefficient results of such correlation is significantly difference from zero and which is the only significant relationship among the BSDs indicators.

When come to the GI, there are two types of significant correlation between the three indicators of BSDs. According to such results, as the first relationship, there is a positive association between GI and IM (r = 0.625, p = 0.000), in second the association exists between GI and BA (r = 0.527, p = 0.000). However, the coefficient results of such two correlations are significantly difference from zero.

4.6 Descriptive Statistics for the Intermediate Variables and Control Variables on Economic Growth

The results of the following Table 4.8 and Table 4.9 show the descriptive statistics in relation to the intermediate variables and control variables which are used to explore the direct and indirect effect on economic growth by banking sector development. The Table 4.8 depicts the intermediate variables on the economic growth equation. Physical Investment (PI), Technology (TC), Human Capital (HC) and the governance infrastructure (GI) are shown in the table. Gross fixed cost capital formation (GFCF), share of manufacturing exports on merchandise exports (MEME) and average secondary and tertiary education enrolment in population (ASTEP) are the proxy variable for the PI, TC and HC respectively while the new governance indicator (NGVI) is proxied for the governance infrastructure.

Table 4.8: Descriptive Statistics of the Intermediate Variables

Variable		Mean	Std. Dev	Min	Max
PI	Overall	25.07	6.71	12.52	45.51
	Between		6.63	15.00	43.25
	Within		1.80	19.48	31.17
TC	Overall	60.44	27.62	3.12	94.02
	Between		28.14	5.60	93.42
	Within		3.23	50.05	76.09
HC	Overall	1.89	0.99	0.45	3.73
	Between		1.00	0.49	3.67
	Within		0.16	1.31	2.35
GI	Overall	0.000	2.27	-3.77	3.62
	Between		2.33	-3.51	3.56
	Within		0.14	-0.37	0.47

As per the results, mean of the physical investment (PI) of the selected countries is 25.07 which are measured by the gross fixed capital formation to GDP (GFCF). The

dispersion of GFCF at 6.71 shows a moderate variability among the selected countries. Furthermore, standard deviation 12.52 to 45.51 indicating a spread of the PI in the selected countries. According to the results, Pakistan recorded the lowest value on GFCF by 12.52 in 2011 and highest value for China by 45.51 in 2013. However the between variability of the GFCF is recorded as 6.63 quite a variability to the overall countries while the minimum and maximum results of 15.00 and 43.25 respectively. Then variability of within the PI is at 1.80 which is a very lower compared to other results. Since, the variability in physical investment within over time is much lower than the variability of such indicator across the countries. It seems that during the period of 2004 to 2016, the physical investment of the each country does not show much fluctuation, but the overall countries do.

Technology (TC) is measured by the share of manufacturing exports on merchandise exports (MEME) of the countries. The average of MEME records at 60.44 association with the standard deviation of 27.62 which indicates higher variability in the selected countries. The spreads of the MEME at the minimum level is 3.12 while the maximum level is at 94.02. When consider the variability between the countries at 28.14 and it takes similar value to overall result. Results indicate that highest value of MEME is recorded by the China in 2013 and lowest value by United Arab Emirates in 2007. The variability within over time of the countries indicates as the 3.23. The minimum and maximum value of MEME 50.05 and 76.09 also indicate the lower spread between values. Since the variation in TC within over time is much lower than the variation of TC across the countries depicts that the share of manufacturing exports on merchandise exports of individual countries has been diverged due to the capacity and size of the economies by its business operations.

Then the mean of the HC records at the 1.89 which is measured by the average secondary and tertiary education enrolment in population (ASTEP). The variations of the ASTEP of overall countries records at 0.99 while the minimum and maximum at 0.45 and 3.73 respectively. According to the results, the highest value 3.75 is achieved by the United States of America in 2010 and 3.74 the lowest value of 0.45 by Afghanistan in 2007. As per the results, the dispersion of ASTEP between the

countries indicates at 1.00 approximately same to the overall performance. However the variability over the time is at 0.16 which is very lower results when compared to others. Since, the variability within over time for HC is also lower than the between across the countries. Thus results depict that average secondary and tertiary education enrolment in population across countries shows higher diversity and it indicates the investment for the education by different countries according to their capacity and vision to develop the HC in their economies.

Then the results of NGVI indicate the estimates created for the governance infrastructure using six indicators by principal component analysis.

Results of the descriptive statistics for control variables are shows in Table 4.9. The descriptive statistics of the table is confined with the variables of Government consumption expenditure (GCE), per capita gross domestic product (PCGDP) is proxied for initial income (II), inflation rate (IFR), annual growth rate of population (GRPO), rule of law (ROL), democracy index (DMI), population with primary education in labour force (PELF), terms of trade (TOT), primary education enrolment in population (PEP), adults fertility rate (ADFR) and population over age 65 and below age 15 (PAG).

Table 4.9: Descriptive Statistics of the Control Variables

Variable		Mean	Std. Dev	Min	Max
GCE	Overall	74.11	16.53	45.71	126.21
	Between		16.75	46.96	119.52
	Within		2.60	64.19	81.01
II	Overall	18,791.13	20,402.71	280.25	67,649.82
	Between		20,532.50	519.35	53,416.97
	Within		3,954.15	1,447.97	33,013.98
IFR	Overall	5.18	3.94	-1.35	15.84
	Between		3.11	0.26	10.59
	Within		2.51	-2.92	14.27
AGRP	Overall	1.52	2.20	-0.32	15.03
	Between		1.78	0.05	7.85
	Within		1.35	-5.81	8.70
ROL	Overall	0.54	0.21	0.12	0.94
	Between		0.21	0.18	0.87
	Within		0.04	0.46	0.70
DMI	Overall	5.96	2.01	2.42	9.22
	Between		2.05	2.55	9.14
	Within		0.22	5.09	6.92
PELF	Overall	28.90	18.15	1.80	67.60
	Between		18.38	2.32	59.10
	Within		2.93	17.77	40.95
TOT	Overall	103.76	38.80	44.19	215.87
	Between		38.53	50.78	176.53
	Within		9.70	60.00	143.10
PEE	Overall	4.53	1.45	1.66	6.15
	Between		1.48	1.88	6.11
	Within		0.13	4.19	4.80
AFR	Overall	34.58	29.23	1.65	123.16
	Between		29.57	1.90	99.74
	Within		4.85	11.57	58.00
PAG	Overall	32.77	7.15	14.03	50.05
	Between		7.28	15.15	49.26
	Within		0.84	29.95	35.65
NRR	Overall	4.73	6.25	0.00	26.17
	Between		6.28	0.00	12.21
	Within		1.25	-1.68	8.85

According to the results in above Table 4.9, average of government capital expenditure (GCE) is the 74.11 associated with the standard deviation of 16.53 which is a higher variability of the data. Furthermore, results indicate that GCE spreads from 45.71 to 126.21 for the Singapore and Afghanistan respectively. Though the variability across the countries records a similar value to overall at 16.75, the dispersion over the time is much lower at 2.60.

When consider the mean of II, it records at $ 18,781.13. The variability of II is at $ 20,402.71 associated minimum and maximum of $ 280.25 and $ 67,649.82 respectively. However the variability across the countries also indicates similar to the overall results at $ 20,532.50. Further results indicate that dispersion of II over the time of the countries is very low at $ 3,954.14.

The mean of IFR is at 5.18% which is a moderate value while the dispersion of IFR records at 3.94% showing a moderate value for the selected countries. However, the IFR deviates from -1.35% to 15.84%. It records lowest and highest IFR from Afghanistan especially. When consider the variation over the time, it indicates at 2.51% and which is not indicate much different from the variation across the countries at 3.11%.

Though the AGRP records a standard deviation of 2.20, the average is the 1.52. However the AGRP spreads -0.32 to 15 in the selected countries. The variability of across the countries and over the time is record at 1.78 and 1.38 respectively. Since the results indicate both the variability of the AGRP do not show a much difference in relation to the population growth.

The variable of ROL depicts the, average of the rule of low estimates at 0.54. However the variability records at 0.21 estimates, it records same estimates for the variability across countries at 0.21. Furthermore, minimum and maximum for overall results is indicated at 0.12 and 0.94 and similar estimates for the across the countries spread. The variability of ROL over time at 0.04 estimates and which is a very lower dispersion.

Democracy index (DMI), mean value at 5.96 estimates while huge dispersion among countries records with the standard deviation of 18.15 estimates. Results shows that highest DMI in the Australia among the data. The variability across the countries similar as overall performance at 2.05 estimates and which is higher than over the time variability recorded at 0.22 estimates.

PELF takes the average of 28.91 and this is the primary level education in labour force spreading between 1.8 to 67.6results respect to the USA and Sri Lanka. The dispersion of the PELF indicates at 18.15 which are much higher. However the dispersion across countries shows similar results for overall at 18.38 while the lower variability is displayed for overt the time at 2.93.

The average of the TOT records at 103.7 associated standard deviation of 38.8. Since it records a higher variability, TOT spreads between the minimum of 44.19 for Republic of Korea and maximum of 215.87 for United Arab Emirates. This result also indicates the higher variability of across the countries at 38.53 than variability over time at 9.70.

Then the average of PEE records at 4.53 while takes standard deviation of 1.45. The dispersion between the countries also records at 1.48. Though the both variability are moderately lower, the dispersion over the time is much lower at 0.13. The minimum and maximum of PEE for the overall results shows between to 1.66 to 6.15.

The AFR is indicated by the adolescent fertility rate of the countries. The mean results of the variable records at 34.58% while takes the maximum of 123.16% for the Afghanistan. Among the countries, the dispersion of the AFR records at the 29.23% which is quite a higher value. However the variability across the countries records at 29.57% similar to the overall, the variability over time indicates at 4.58% showing a lower result than others.

Then the PAG which is the population aging rate gets the average of 32.77%associated with the standard deviation of 7.15% which is a huge deviation among the countries from its average value. Further it records the minimum and maximum of 14.03% and 50.05%. Same as to the overall variability, the variability across the countries also records at 7.28%. However, the variability over time is very lower at 0.84% for the selected countries.

Finally, the NRR indicates its average value at 4.73% associated standard deviation of 6.25%. The spreads of the NRR records 0.00% to 26.17% respectively. The variability of NRR across the countries indicates a similar value to the overall dispersion at 6.28%, while the quite lower variability records for overtime at 1.25%.

4.7 Correlation Analysis between Economic Growth, Banking Sector Development, Intermediate and Control Variables

Below Table 4.10, Table 4.11, Figure 4.8 and Figure 4.9 shows the correlation output between banking sector development variable and economic growth and intermediate variables and economic growth respectively.

However, following Figure 4.8 shows the correlation between economic growth and banking sector development indicators. Y axis of all the graphs represents the economic growth by real gross domestic product growth (RGDPG). The the X axis of the Graph A represents the bank intermediatio (IM) by private credit to deposit money bank (PCDMB). In Graph B, X axis idicates by the commercial bank branches per 100,000 adults (CBB) which is proxy variable for the bank access (BA). Then Graph C indicates the X axis by bank resturn on assets (BROA) which is the proxy variable for bank profitability. Finally, the Graph D shows the X axis by bank liquid assets to deposit (BLAD) which is the proxy variable for bank liquidity (LQ).

As per the results, there is a negative association between EG and IM ($r = -0.290$, $p = 0.000$) and which is the weak linear negative relationship between the EG and IM. Thus, the correlation coefficient between EG and IM is significantly different from zero. Graph A in Figure 4.8 also confirms such relationship among the two variables of cross countries when increase the IM, the EG is decreased. In the case of the BA and EG, the association between such variables is evidenced by its coefficient ($r = -0.492$, $p = 0.000$) and which is significantly difference from zero. The results show that moderate negative linear association between the BA and EG and Graph B in Figure 4.8 also confirms from its fitted line, when increase the BA, decrease the EG. Further there is a positive association between the EG and PF and which is confirmed by its coefficient ($r = 0.204$, $p = 0.001$) and the correlation is significantly

difference from zero. However, though it is a positive weak relationship, when PF increases, the EG also improve. The Graph C in Figure 4.8 further shows its slightly upward trend from the fitted line. The other BSD indicator, LQ shows that there is no association between EG and LQ (r = 0.025, p = 0.749) and which is not significantly difference from zero among the cross-country data. Thus, Graph D in Figure 4.8 figure also the confirmed its insignificant behaviour.

As per the results given in the Table 4.10, the association between EG and IM, BA, PF and ST are illustrated initially and Figure 4.8 shows its relationship graphically as follows.

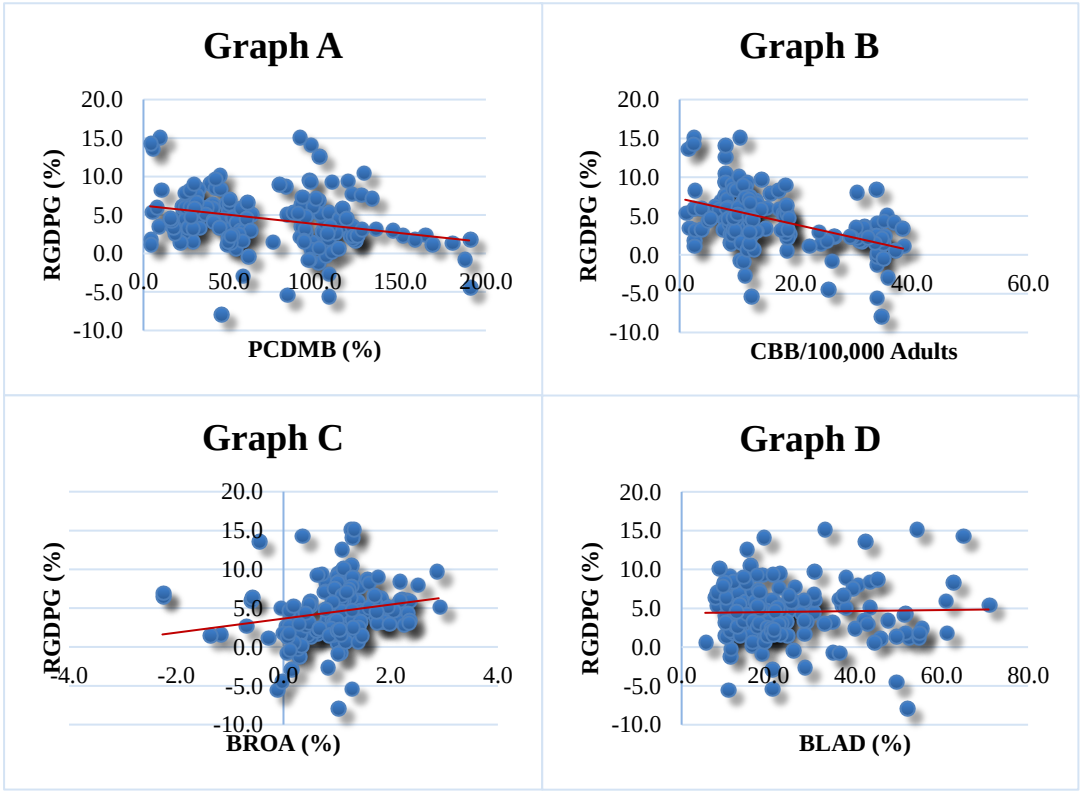

Figure 4.8: Correlation between the EG and Indicators of the BSD

Table 4.10: Correlation between the EG, BSD Variables and Intermediate Variables

Variable	EG	IM	BA	PF	LQ	PI	TC	HC	NGVI
EG	1.000								
IM	-0.290**	1.000							
BA	-0.492**	0.332**	1.000						
PF	0.204**	-0.203**	-0.116	1.000					
LQ	0.025	-0.082	-0.008	0.058	1.000				
PI	0.351**	0.175*	-0.199*	0.152	-0.403**	1.000			
TC	0.044	0.261**	-0.141	-0.310**	-0.477**	0.266**	1.000		
HC	-0.435**	0.477**	0.858**	-0.133	0.010	-0.194*	-0.087	1.000	
NGVI	0.336**	0.595**	0.544**	-0.016	-0.072	-0.101	-0.052	0.601**	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

Then the correlation results of the intermediate variables and economic growth is illustrated in the same Table 4.10. There are four variables for the intermediate variables under the growth equation. To test the direct effect of the BSD on EG namely PI, TC, HC and GI are used. Further, the relationship between EG and intermediate variables are depicted in the Figure 4.9 with four picture panels.

The following Figure 4.9 depicts the correlation between economic growth and channel variables. According to the four graps, Y axis of all the graphs represents the economic growth by real gross domestic product growth (RGDPG). The the X axis of the Graph A indicates the gross fixed capital formation to gross domestic product (GFCF) which is the proxy variable for physical investment (PI). Then Graph B represents the X axis by the proxy variable of manufacturing export share on merchandise exports (MEME) for technology variable (TC). The X axis of Graph C indicates the average working population with secondary and tertiary education level (ASTEP) which is a proxy variable for the human capital (HC). In last, the Graph D shows the X axis by new governance indicator (NGVI) to represents the governance infrastructures (GI) in the selected economies.

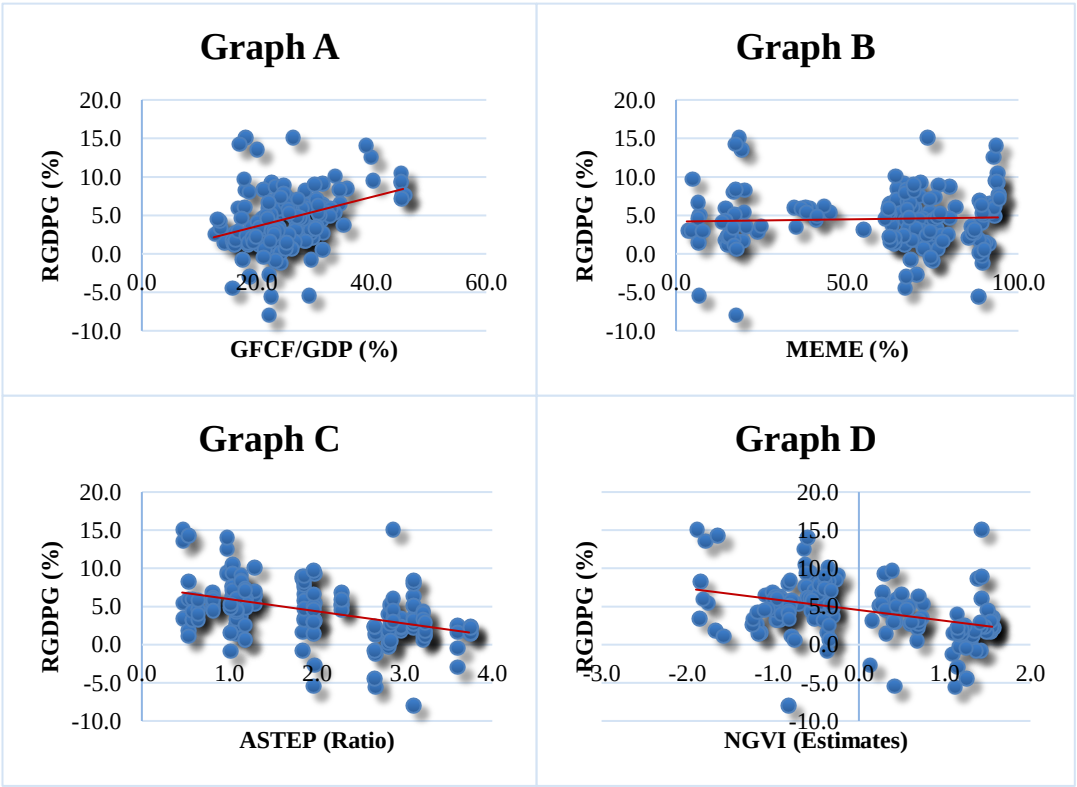

Figure 4.9: Correlation between the EG and Intermediate Variables

However, the correlation results indicate that, there is a positive association between EG and PI ($r = 0.351$, $p = 0.000$). The coefficient results confirm that correlation between EG and PI is significantly difference from zero. In addition to that, the

Graph A in Figure 4.9 also confirms its positive weak relationship, when increase the PI, the EG is increased. The second intermediate variable, TC shows its positive association between EG. However the results evidence that there is no significant correlation between EG and TC (r = 0.044, p = 0.582) thus the coefficient also confirms the relationship between such variables are not significantly difference from zero. The Graph B in Figure 4.9 gives further pictorial description it's no relationship.

In next, there is a negative association between EG and HC (r = -0.435, p = 0.000). The coefficient results also confirm that the correlation between EG and HC is significantly difference from zero. The Graph C in Figure 4.9shows, when increase the HC, decrease the EG in direct effect. Finally results depicts that there is a negative association between EG and GI (r = -0.336, 0.000). The variable GI is the new variable of the governance infrastructure variable including six indicators. The Graph D in Figure 4.9 also depicts its negative relationship, when increase the GI, decrease the EG. As per the coefficient results, the correlation between EG and GI is significantly difference from zero.

Further above Table 4.10 shows the correlation between the BSD indicators and intermediate variable. This given result also important to illustrate, because the channel effect of the each BSD indicators are checked through the mentioned intermediate variables.

The results confirm that there is a positive association between IM with considered intermediate variables. The coefficient of the each intermediate variable with IM confirms that its association between IM and PI (r = 0.175, p = 0.026), IM and TC (r = 0.261, p = 0.001), IM and HC (r = 0.476, p = 0.000) and IM and GI (r = 0.625, p = 0.000) respectively. Results confirm that the correlations are significantly difference from zero. In the case of the association between BA and PI, HC, GI shows the significant correlation. The coefficient between BA and PI (r = -0.199, p = 0.011) is the negative weak correlation. However HC (r = 0.858, p = 0.000) and GI (r = 0.527, p = 0.000) shows it correlations are strongly and moderate positive with CBB

respectively. However PF shows an association between TC (r = -0.299, p = 0.000). Finally the results show there is a negative association between PF and its channel variables of PI, TC and GI respectively. The coefficient results confirm that the correlation between PF and PI (r = -0.403, p = 0.000) and PF and TC (r = -0.476, p = 0.000) are significantly difference from zero.

The correlation results between EG and control variables are shown in below Table 4.11. There are seven control variables in the main equation on economic growth. Which are the GCE, II, IFR, TO, FDI, GRPO and NRR.

Table 4.11: Correlation between the EG and Control Variables

Variable	EG	GCE	II	IFR	TO	FDI	AGRP	NRR
EG	1.000							
GCE	-0.133	1.000						
II	-0.414**	-0.467**	1.000					
IFR	0.180*	0.299**	-0.602**	1.000				
TO	0.084	-0.519**	0.320**	-0.221**	1.000			
FDI	0.192*	-0.471**	0.342**	-0.168*	0.804**	1.000		
AGRP	0.021	-0.012	0.079	0.174*	0.281**	0.144	1.000	
NRR	0.020	-0.361**	0.224**	0.084	0.075	-0.022	0.440**	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

The results show that except to NRR, there is an association between other control variable and the EG. There is a negative association between the GCE and EG (r = -0.289, p = 0.000). It further says that when increase the GCE, the EG decreases. In the results of II, it is shows a negative association between EG (r = -0.455, p = 0.000). However the IFR, TO, FDI and GRPO show the positive association between EG indicating the IFR (r = 0.283, p = 0.000), TO (r = 0.197, p = 0.000), FDI (r = 0.231, p = 0.000) and GRPO (r = 0.181, p = 0.000) respectively. However, the correlation coefficient results confirm that the association between EG and such variable except NRR are significantly difference from zero.

4.8 Correlation Analysis between Intermediate Variables and Control Variables

To explore the indirect relationship between the BSD and EG, the four channel variables have been identified based on the endogenous economic growth model.

According to the results, there are four intermediate variables namely, PI, HC, TC and GI. Initially the correlation results between PI and its control variables are shown in following Table 4.12. Result shows according to the eight control variable.

Table 4.12: Correlation between the PI and Control Variable

Variable	PI	II	GCE	TO	IFR	ROL	DMI	FDI
PI	1.000							
II	-0.040	1.000						
GCE	-0.605**	-0.447**	1.000					
TO	0.044	0.320**	-0.519**	1.000				
IFR	-0.134	-0.602**	0.299**	-0.221**	1.000			
ROL	-0.018	0.882**	-0.381**	0.361**	-0.580**	1.000		
DMI	0.024	0.454**	-0.100	-0.109	-0.329**	0.632**	1.000	
FDI	0.078*	0.342**	-0.471**	0.804**	-0.168*	0.400**	0.005	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

The association between the PI and considered control variables shows both positive and negative relationship. There is an association between GCE and PI (r = -0.630, p = 0.000) and the coefficient results confirms that association between mentioned variables are significantly difference from zero. On the other hand association between TO and PI also significantly difference from zero according to its coefficient values (r = 0.172, p = 0.029). Then the FDI also depicts the positive association between PI (r = 0.203, p = 0.010) while the negative association display by the variable between ADFR and PI (r = -0.270, p = 0.001). Thus, both mentioned association are significantly difference from zero according to its significance results.

The correlation result of HC between its controls variables are shown in Table 4.13.

Table 4.13: Correlation between the HC and Control Variables

Variable	HC	TC	II	GCE	TO	PAG	ROL
HC	1.000						
TC	-0.087	1.000					
II	0.862**	-0.115	1.000				
GCE	-0.228**	-0.168*	-0.467**	1.000			
TO	0.083	0.003	0.320**	-0.519**	1.000		
PAG	-0.405**	0.087	-0.670**	0.756**	-0.494**	1.000	
ROL	0.737**	0.079	0.882**	-0.381**	0.361**	-0.494**	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

Results shows that there are five significant associations between HC and control variables except the TO variable. There is a negative association between HC and TC ($r = -0.169$, $p = 0.032$). Same as the TC, GCE also shows the negative association between HC ($r = -0.198$, $p = 0.11$). Further, results depicts that another negative association between PAG and HC ($r = -0.433$, $p = 0.000$). The positive association between II and HC ($r = 0.847$, $p = 0.000$) and ROL and HC($r = 0.720$, $p = 0.000$) are respectively mention. However, according to the coefficient of the mentioned pair variables, associations are significantly difference from zero.

The below Table 4.14 shows the correlation between TC and control variables. Results show that available association among variables are negative. Thus, first variable depicts that there is a negative association between HC ($r = -0.169$, $p = 0.032$). Then the TO and TC show the negative association ($r = -0.171$, $p = 0.029$). ADFR, IFR and TOT confirm by its coefficient results, there is a negative association between ADFR and TC ($r = -0.255$, $p = 0.001$), IFR and TC ($r = -0.178$, $p = 0.024$) and TOT and TC ($r = -0.813$, $p = 0.000$) respectively. It confirms the associations between variables are significantly difference from zero.

Table 4.14: Correlation between the TC and Control Variables

Variable	TC	HC	II	PELF	TO	GCE	RIR	ADFR	ROL	IFR	TOT
TC	1.000										
HC	-0.087	1.000									
II	-0.115	0.862**	1.000								
PELF	0.196*	-0.341**	-0.195*	1.000							
TO	0.003	0.083	0.320**	-0.077	1.000						
GCE	-0.168*	-0.228**	-0.447**	-0.162*	-.519**	1.000					
RIR	0.046	-0.195*	-0.179*	0.000	0.040	0.168*	1.000				
ADFR	-0.173*	-0.655**	-0.756**	-0.029	-0.295**	0.665**	0.221**	1.000			
ROL	0.079	0.737**	0.882**	-0.035	0.361**	-0.381**	-0.070	-0.677**	1.000		
IFR	-0.144	-0.414**	-0.602**	0.047	-0.221**	0.299**	-0.010	0.438**	-0.578**	1.000	
TOT	-0.901**	0.200*	0.264**	-0.139	-0.042	0.004	-0.131	0.000	0.038	-0.024	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

Table 4.15: Correlation between the NGVI and Control Variables

Variable	GI	II	GCE	PEE
GI	1.000			
II	0.765**	1.000		
GCE	-0.323**	-0.447**	1.000	
PEE	0.588**	0.835**	-0.463**	1.000

**Correlation is significant at the 0.01 level (2-Tailed)
*Correlation is significant at the 0.05 level (2-Tailed)

The results of the correlation between GI, first principal component of the governance infrastructure indicators and considered control variables are shown in Table 4.15. According to the results, there is a positive association between II and GI ($r = 0.773$, $p = 0.000$). Then the GCE denote its association between GI as the negative one ($r = -0.285$, $p = 0.000$). Finally the association between PEE and GI is the positive result ($r = 0.531$, $p = 0.000$). However according to the coefficient results among the association confirms that, the correlation between mention variables are significantly difference from zero.

4.9 Chapter Summary

This chapter thoroughly discussed the nature of the variable selected in the study initially by the descriptive statistics and graphical presentation by the line charts. The line charts depicted the behaviour of the determinants of the banking sector development. It showed that the global scenarios of EG, IR, TL and FL have behaved according to the more or less same pattern during the period of 2006 to 2010. It can be suggested that global financial crisis and negative economic consequences has influenced to the variables globally and selected countries. However, GI also indicated that the developed countries with higher income has recorded a higher estimates for the GI while the developing countries and emerging economies recorded the middle level or lower level estimates. This also shows a kind of relationship between financial crisis and governance of such countries.

Then the panel descriptive statistics explains the nature of the selected variables, including mean, standard deviation, maximum and minimum. Especially, results

shows the behaviour of the variables according to the across the countries and over the time of the countries in addition to the overall performances.

Principal component analysis is done to extract the component which accounts for the maximum variance of the original system of the governance infrastructure. The test has done using six indicators of the governance infrastructures and result found the new governance indicator using PC1 which has accounted for the maximum variation of the original system.

Then the correlation analysis has done using the Pearson correlation analysis. The correlation analysis has done for the variables between indicators and determinists of the banking sector development, between economic growth, banking sector development, intermediate and control variables and between intermediate variables and control variables. Finally the results confirmed that there is association between among majority of the variables except few are not available. However, according to the objectives of this study, correlation analysis is not a compulsory test, but it also confirmed the strong relationship between variables.

CHAPTER FIVE

DETERMINATS AND EFFECT OF THE BANKING SECTOR DEVELOPMENT, ECONOMIC GROWTH

5.1 Introduction

This chapter presents the results of the determinants of the BSD found by the Generalized Method of Moment (GMM) estimation and direct and indirect effect on economic growth by the Three Stage Least Square (3SLS) estimation. Results of the four models are presented using the indicators of BSD, bank intermediation (IM), bank broad access (BA) and bank profitability (PF), however the mention three models for determinants of the BSD are explored by the Arellano-Bond GMM estimation while the bank liquidity (LQ) is estimated by the System GMM. Next, the direct and indirect effect of BSD on EG is estimated. Direct effect is measured by way of the mentioned four indicators of the BSD on economic growth, while the indirect effect is measured through the channel variables of physical investment (PI), technology (TC), human capital (HC) and governance infrastructure (GI) by the four indicators of the BSD on economic growth using 3SLS estimation.

5.2 Model Developed for Bank Intermediation (IM) using Arellano-Bond-GMM

Under this model, the results of the determinants of BSD are derived based on private credit by deposit money bank to GDP (PCDMB) which is proxied for the bank intermediation (IM). The results of the model are given in following Table 5.1.

Table 5.1: Determinants of development of the Bank Intermediation (IM)

Variables	Co-efficient	P-value
IM_{t-1}	0.6001*	0.000
	(11.80)	
EG	-0.9777*	0.000
	(-10.28)	
TL	-0.1456*	0.008
	(-5.31)	
GI	6.0146*	0.021
	(2.32)	
FL	-0.1839	0.136
	(-1.49)	
IR	0.1146*	0.042
	(2.04)	
Sargan-test		0.9895
Order 1		0.1147
Order 2		0.1978

Note: t-statistics. * significance at 5% level.

Based on the derived results, the developed model can be written as follows.

$$IM_{i,t} = 0.6001\, IM_{i,t-1} - 0.9777\, EG_{i,t} - 0.1456\, TL_{i,t} + 6.0146\, GI_{i,t} + 0.1146\, IR_{i,t} + \varepsilon_{i,t}$$

Initially the results in Table 5.1 show that the calculated p-values for the Sargan-test is greater than 0.05, since it confirms the hypothesis that over identified instruments are valid for the model. Meanwhile the p-values for the Arellano and Bond serial correlation tests indicates the presence of the first order serial correlations (p = 0.1147) was insignificant but, it can be ignored being the second order serial correlations (p = 0.1978) for the model is absent. Therefore, Sargan-test provides the evidence for the un-biasness while, Arellano and Bond serial correlation test results confirm that consistency of the coefficients estimated for by the second order serial.

The coefficient of lagged value of the IM is significant (p = 0.000) and positive. The coefficient of 0.6001 indicates that the improvement of one unit of PCDMB in

previous year has improved the average PCDMB of current year holding other predictors in the model constant. Therefore, it further indicates that development of the one unit in bank intermediation in previous year in selected countries is expected to increase the bank intermediation in current year by 60.01%. Since, this result shows the statistical significant of Arellano-Bond GMM which is appropriate estimator, thus empirical results can be relied upon for statistical inference.

Then, the results show that EG significantly determines the reduction of IM. According to the results, the coefficient of RGDPG -0.9777 is significant (p = 0.000) and it indicates that improvement of every additional unit of EG of the selected countries is expected to decrease the average of bank intermediation by 97.77%. As per the previous empirical studies, though it is expected the positive relationship between bank intermediation and economic growth, results shows the negative impact on this bank intermediation indicator. Hsu and Lin (2000) found that banking development is positively related to the short and long term economic growth. Yu and Gan (2010) found that real GDP has positively related to the domestic credit in Malaysia.

In the case of TL, it determines the reduction of IM significantly. The coefficient of TO -0.1456 is significant (p = 0.008) and indicates that for every additional unit change in TL is expected to decrease the average bank intermediation by 14.56% while holding other predictors in the model constant. Though many empirical studies found the positive impact by TO on BSD, the results of this study found the negative impact. But, Law and Habibullah (2009) found that trade openness and capital flows are statistically significant determinants of the financial development.

The coefficient of the GI, 6.0146 is significant (p = 0.021) and positive toward the IM. Since, results indicate that every additional unit change in governance infrastructure is expected increase the average IM by 6.01 estimates while holding other predictors in the model constant. However, previous studies have showed that mixed results on governance. Naceur (2014) found the results of positive link of institutional variable, rule of law has impacted on the banking sector development in

a cross country studies. The results of the studies done by the previous scholars (Özkan-Günay, Günay & Günay, 2013; Filippidis & Katrakilidis, 2014; and Donia, 2012) confirm the results in this study.

Further coefficient result of IR indicates which has significantly determined the IM. Since, coefficient result of RIR, 0.1146 is significant ($p = 0.042$) and indicates that every additional unit change in IR is expected to increase the average IM by 11.46%. As per the theoretical assumptions, positive RIR promotes financial development through the increased volume of savings and stimulates growth through improving of volume of productivity of capital (McKinnon, 1973 and Shaw, 1973).

However, the coefficient result of FL is insignificant ($p = 0.136$) and it indicates that every additional unit change in FL does not influence to the average IM. However Demerguç-Kunt and Huizingha (2001) found that in the context of developing economies, too rapid and uniformed liberalization of the banking industry might not bring optimal outcome, due to huge competition among the banking sector it has resulted to lower banking sector performance.

5.3 Model Developed for Bank Broad Access (BA) using Arellano-Bond-GMM

The results of the determinants of BSD are derived based on commercial bank branches per 100,000 adults (CBB) which is the proxy for bank broad access (BA). The results of the model are given in following Table 5.2.

Table 5.2: Determinants of development of the Bank Broad Access (BA)

Variables	Co-efficient	P-value
BA_{t-1}	0.7738*	0.000
	(55.01)	
EG	0.0330*	0.000
	(4.20)	
TL	0.0119*	0.032
	(2.14)	
GI	-0.3112*	0.039
	(-2.06)	
FL	0.0116	0.078
	(1.76)	
IR	0.0049	0.103
	(1.63)	
Sargan-test		0.9872
Order 1		0.1308
Order 2		0.5613

Note: t-statistics. * significance at 5% level.

Based on the derived results, the developed model can be written as follows.

$$BA_{i,t} = 0.7738\, BA_{i,t-1} + 0.0330\, EG_{i,t} + 0.0119\, TL_{i,t} - 0.3112\, GI_{i,t} + \varepsilon_{i,t}$$

The results in Table 5.2 show that the calculated p-value for the Sargan-test is greater than 0.05, since, it confirms the hypothesis that over identified instruments are valid for the model. Then the p-values for the Arellano and Bond serial correlation tests indicates the presence of the first order serial correlations (p = 0.1308) is insignificant but, it can be ignored being the second order serial correlations (p = 0.5613) for the model is absent. Therefore, Sargan-test provides the evidence for the un-biasness meanwhile, Arellano and Bond serial correlation test results confirms that consistency of the coefficients estimated for by the second order serial.

The coefficient of lagged value of BA, 0.7738 also shows a positive significant (p = 0.000) in relation to the model. Results indicate that improvement of every additional unit of bank broad access in previous year in selected countries is expected to

increase the average bank broad access in current year by 77,380 bank branches in selected 18 countries holding other predictors in the model constant. Since, this result further shows the statistical significant of Arellano-Bond GMM which is appropriate estimator, thus empirical results can be relied upon for statistical inference.

The results show that economic growth significantly determines the development of bank access. According to the results, the coefficient of EG 0.0330 is significant (p = 0.000) and it indicates that every additional unit improvement of real GDP growth of the selected countries is expected to increase the average bank access by 3,300 branches while other predictors in the model constant. As per the McKinnon's words (1973), there is a widespread agreement that flow of savings and investment in decentralized market, would lead to economic growth. Thus, Kaushal and Ghosh (2016) found that development of economy has helped to develop the banking institutions and causality is exhibited from the economic growth. This is confirmed by the hypothesis of demand following on economic growth propel the financial development by Patrick (1960). Among the countries, developed and emerging has greatly influenced by the economic growth to development of commercial banks than developing markets.

On the other hand, results of the TL and GI also positively and negatively determine the development of the bank broad access. The coefficient result of TL, 0.0119 (p = 0.032) indicate that every additional unit change in trade openness of the selected countries is expected to increase the average bank access by 1,119 branches while other factors in the model are constant. Furthermore, previous researchers (Gezae, 2015; Harrison, 1994; and Rajan & Zingales, 2003) also confirm the significant impact of trade openness on banking sector development. However, the coefficient result of the GI, -0.3112 (p = 0.039) indicate that every additional estimate change in GI is expected to decrease the average of bank access by 31,120 branches in selected sample of the countries while other predictors in the model constant. When the total imports and exports are improved, that has strengthened the commercial bank branches network in the financial sector. On the other hand implication of the governance infrastructure indicators have caused to brought more impediments to the

development of commercial bank branches among the selected countries. This result further confirms that institutional quality has negatively influenced to develop the BA. Capasso (2004) emphasized that good institutions enable the financial markets to channel resources to productive activities and to minimize their waste and misuse. Therefore, the results confirm that the inverse impact by GI on BA, due to the lower institutional qualities among emerging and developing countries. It further highlights its downward pressure for savings and lending access.

The coefficient results of the FL ($p = 0.078$) and IR ($p = 0.103$) are insignificant in relation to the development of the bank broad access. Since, every additional unit change in the FL and IR does not make any change the results of the average BA. This would be a reason of people didn't access to banks for their financial needs due to the lower value of money, thus they may have used their funds for the consumption or any other alternative purpose. Other reason is the financial meltdown during these periods has reduced the trust of banks on people which has impacted to reduce its development. Some scholars (Klein & Olivei, 2008; and Ibrahim & Habibullah, 2013) also found that financial liberalization is vital determinants towards the banking sector development.

5.4 Model Developed for Bank Profitability (PF) using Two-Step System-GMM

The initial results of the determinants of the BSD are derived based on banks return on assets (BROA) which is a proxy for the bank profitability (PF) indicator and results are shows in Table 5.3.

Table 5.3: Determinants of development of the Bank Profitability (PF)

Variables	Co-efficient	P-value
PF_{t-1}	0.3314*	0.000
	(11.42)	
EG	0.0159*	0.001
	(3.38)	
TL	0.0072*	0.001
	(3.45)	
GI	-0.1820	0.070
	(-1.81)	
FL	0.0124	0.112
	(1.59)	
IR	0.0130*	0.005
	(2.83)	
Sargan-test		0.9998
Order 1		0.0469
Order 2		0.4642

Note: t-statistics. * significance at 5% level.

Based on the derived results, the developed model can be written as follows.

$$PF_{i,t} = 0.3326\, PF_{i,t-1} + 0.0155\, EG_{i,t} + 0.0071\, TL_{i,t} + 0.0126\, IR_{i,t} + \varepsilon_{i,t}$$

According to the results in Table 5.3, the calculated p-value for the Sargan-test is greater than 0.05, it confirms the hypothesis that over identified instruments are valid for the model. Then, the p-values for the Arellano and Bond serial correlation tests indicate the presence of first order significant serial correlations (p = 0.0469) and the absence of second order serial correlations (p = 0.4642) for the model. Therefore, both Sargan-test and Arellano and Bond serial correlation test results provide the evidences for un-biasness and consistency of the coefficients estimated for the model.

Initially, the coefficient of lagged value of the bank profitability is significant (p = 0.000) and positive. The coefficient of 0.3314 depicts that the one unit changes in BROA of previous year has improved the average BROA of current year holding

other predictors in the model constant. Thus, it further indicates that for every additional unit of banks' profitability in previous year in selected countries is expected to increase the average banks' profitability in current year by 33.14%. Since, this result further shows the statistical significant of dynamic GMM which is appropriate estimator, thus empirical results can be relied upon for statistical inference.

Results indicate that EG, TL and IR determine the development of the bank profitability in selected countries significantly. The BROA is a proxy variable which shows the ability of generates profit from their assets which is an important measure of the financial efficiency. The coefficient of EG 0.0159 is significant (p = 0.001) and indicates that for every additional unit of real gross domestic product is expected to increase the average bank profitability by 1.59% while other predictors in the model constant. The influence of the EG has showed that improvement in the real sector has created the demand for financial services, under which financial intermediation has earned its return on their assets. However, the financial crisis during this period has impacted to developed economics than developing, thus it was able to record the slight improvement. Asthanasoglou, Delis and Staikouras (2006) found that variables such as GDP positive impact on profitability in South Eastern European regions. Yu and Gan (2010), and Razal, Shahzadi and Akram (2014) found that the similar results in their studies.

The coefficient of the IR indicates that, RIR has significantly determined the development of PF. The coefficient of IR 0.0130 is significant (p = 0.005) and depicts that change in every additional unit of real interest rate is expected to increase the average banks' profitability by 1.30% while holding other predictors in the model constant. On the other hand, banking sector has earned out of their assets through the given loans to individual and public sector. Because of the improvement of IR, the banks have able to lend before the crisis more and given loans accrued the huge interest during these period. researchers also found that equal results in their studies regarding the interest rate (Gezae, 2015; Yu & Gan, 2010; McKinnon, 1973; and Shaw, 1973).

Furthermore, the coefficient results TL indicates that TO has significantly determined the development of BROA. Results indicates that the coefficient of 0.0071 is significant ($p = 0.001$). However, every additional unit change in TL of the selected countries is expected to increase the average of PF by 0.72% while holding other predictors in the model constant. Results confirms, though the crisis time brought down the international trade by significant amounts, prevailed trades among the countries without barriers have encouraged to lend for the importers and exporters which has slightly increased the banks' return.

However, GI and FL show that it determines the development of the PF negatively and positively respected manner, but the results are not the significant one due to not comply the statistical parameters. Since, the changes of governance indicators and foreign direct investment did not change the value of banks' return on assets during the period for the selected 18 countries.

5.5 Model Developed for Bank Liquidity (LQ) using Arellano-Bond-GMM

The results of the determinants of the BSD are derived based on banks liquid assets to deposit (BLAD) which is proxied for bank liquidity (LQ) and results are shows in Table 5.4.

Table 5.4: Determinants of development of the Bank Liquidity (LQ)

Variables	Co-efficient	P-value
LQ_{t-1}	0.1840*	0.000
	(5.66)	
EG	-0.0277	0.416
	(-0.81)	
TL	-0.0539*	0.000
	(-3.50)	
GI	-10.4644*	0.000
	(-6.68)	
FL	0.1353*	0.045
	(2.00)	
IR	0.1141*	0.004
	(2.88)	
Sargan-test		0.9804
Order 1		0.0903
Order 2		0.5581

Note: t-statistics. * significance at 5% level.

Based on the derived results, the developed model can be written as follows.

$$LQ_{i,t} = 0.1840\, ST_{i,t-1} - 0.0539\, TL_{i,t} - 10.4644\, GI_{i,t} + 0.1353\, FL_{i,t} + 0.1141\, IR_{i,t} + \varepsilon_{i,t}$$

According to the results in Table 5.4, the calculated p-value for the Sargan-test is greater than 0.05, it confirms the hypothesis that over identified instruments are valid for the model. Then the p-values for the Arellano and Bond serial correlation tests indicates the presence of the first order serial correlations (p = 0.0903) is insignificant but, it can be ignored being the second order serial correlations (p = 0.5581) for the model is absent. Therefore, Sargan-test provides the evidence for the un-biasness meanwhile, Arellano and Bond serial correlation test results confirms that consistency of the coefficients estimated for by the second order serial.

The BLAD is a proxy variable for stability of the banking sector. Initially, the coefficient of lagged value of the LQ is significant (p = 0.000) and positive. The

coefficient of 0.1840 depicts that every one unit of changes in the LQ of previous year has improved the average LQ of current year holding other predictors in the model constant. Thus, it further indicates that change in every additional unit of bank stability in previous year in selected countries is expected to increase the average banks' stability in current year by 18.40%. Since, this result further shows the statistical significant of Arellano-Bond GMM which is appropriate estimator, thus empirical results can be relied upon for statistical inference.

According to the result, the TL determine the reduction of the BS in selected 18 countries, because the coefficient of the TO, -0.0539 which is significant (p = 0.000). Since, results indicate that every additional unit change in TL of the selected countries is expected to decrease the LQ by 5.39% while other predictors in the model constant. In this scenario, improvement of trade liberalization discouraged the LQ in selected countries during the crisis time. But according to the many empirical results, positive impact can be seen. Ahmad and Sehrish (2014) found that trade openness and real GDP have positive and significant impact on financial sector of SAARC countries.

Then the coefficient result of GI, -10.4644 shows the negatively significant impact (p = 0.000). The coefficient indicates that every additional unit change in GI is expected decrease in average LQ by 10.46 estimates while holding other predictors in the model constant. The institutional quality and governance is vital for the sustainable development of the banking sector. In here, it can be seen that poor institutional quality of the developing countries compared to developed economies has influenced by way of negative pressure on LQ.

On the other hand, FL also determines the development of LQ. The coefficient of FDI, 0.1353 is recorded as the significant impact (p = 0.045). Result indicates that every additional unit change in FL of the selected countries is expected to increase average LQ by 13.53% while other predictors in the model constant. Though this is the crisis period, the FDI inflows to the countries have improved the BLAD.

Coefficient results of the IR, 0.1141 indicates the positive significant (p = 0.004) impact on the development of the LQ. Result indicates that one unit change in IR of the selected countries is expected to increase the average bank stability by 11.41% while other predictors in the model constant. Thus the IR of the countries has influenced to accumulate funds before the crisis period has come to liquid during the periods. This is because, when IR increases, the banking stability by way of cancelling long term deposits for the availability for the private sector requirements. However in the study of Ahmad and Sehrish (2014), revealed a negative impact of RIR on financial development in SAARC countries.

However, the EG shows negative insignificant results (p = 0.416) towards the development of LQ, because every additional unit change in EG of the selected countries doesn't make any impact on the development of the LQ.

5.6 Direct and Indirect effect of Bank Intermediation (IM) on Economic Growth

Table 5.5: Results of 3SLS for IM on EG

	Direct Effect Model	Indirect Effect Models			
Variable	**EG**	**PI**	**HC**	**TC**	**GI**
R^2	0.3166	0.6038	0.8582	0.8625	0.6072
Constant	46.9528*	77.0387*	-6.2538*	193.7412*	-9.2589*
	(2.89)	(17.71)	(-12.94)	(14.00)	(-8.78)
IM	0.0131	0.0138	-0.0060*	0.1713*	0.0082*
	(1.32)	(1.23)	(-5.90)	(5.65)	(2.39)
PI	-0.0155				
	(-0.10)				
HC	3.1311*			14.5643*	
	(3.03)			(5.03)	
TC	-0.0487		0.0056*		
	(-1.60)		(4.27)		
GI	-0.1443				
	(-0.54)				
GCE	-0.1469	-0.3755*	-0.0037	-0.3420*	0.0037
	(-1.49)	(-14.59)	(-1.18)	(-4.61)	(0.49)
II	-3.8333*	-3.0108*	0.8653*	-8.4267*	1.0777*
	(-4.73)	(-6.49)	(16.97)	(-3.99)	(8.22)
IFR	-0.2983*	-0.2262*		-0.8547*	
	(-3.25)	(-2.10)		(-3.32)	
AGRP	0.4554*				
	(2.50)				
FDI	0.3844*	0.1794			
	(4.11)	(1.48)			
TO	-0.0127	-0.0353*	-0.0019*	-0.0164	
	(-1.40)	(-4.94)	(-4.60)	(-1.26)	
NRR	-0.1041				
	(-0.60)				
RIR				-0.0628	
				(-0.34)	
ROL		9.3827*	-0.8552*	-19.1721*	
		(2.07)	(-2.48)	(-2.03)	
DMI		-0.0075			
		(-0.03)			
PAG			0.0462*		
			(5.86)		
AFR				0.0181	
				(0.35)	
TOT				-0.5960*	
				(-24.43)	
PEE					-0.2440
					(-1.76)
PELF				0.1487*	
				(2.66)	
Channel Effect		-0.0002	-0.0189*	-0.0083	-0.0012
		(-0.02)	(-2.69)	(-1.54)	(-0.52)

Note: t-statistics. * significance at 5% level.

In here, the results of the direct and indirect impact of BSD development on EG are explored by BSD indicator of the IM. The direct effect of the IM on the EG is measured on the EG model while the indirect effect of IM is measured through the channel variables of PI, TC, HC and GI. The results of the 3SLS estimation are given in above Table 5.5.

According to the results, R^2 results show that the fit of each models. Results indicate that 60% variation in the PI is explained by its predictors. Then 86%, 86% and 61% variations in HC, TC and GI respectively are explained by its relevant predictor variables. The strength of the fit of the EG model is shown as 32%.Though, the R^2 is reported a lower variance for the EG model, the objective of this section is to explore the direct and indirect effect of the IM on EG. Since, the value of $R^2$of the economic growth model can be avoided according to the purpose.

Results depict that the direct effect of the IM on EG is positive as expected, but the result is not significant. It evidences that though one unit change of the IM doesn't improve the average EG while other predictors in the model constant. Rachid and Mbarek (2011) has used the real gross domestic product growth for the study on OECD and MENA countries and found the long term relationship of economic growth. Thus, improvement of PCDMB is not sufficient to improve the economic growth in selected countries. One of assumed reasons for this result can be the financial crisis taken place during the period of 2008 to 2010 which has brought diverse range of negative results to economies. Therefore, the private credit lent couldn't achieve the expected results and banks may not have chosen the correct projects and ventures to spur the economy. On the other hand, inflation may bring unexpected negative consequences. Inflationary effect was much stronger on Private Credit to GDP (Akosah, 2013). Since, it should focus on improving credit allocation by the banking sector by sufficient manner for the most effective projects.

Further, when considered the four channel variables in the growth model, only HC significantly influence on economic growth in selected countries. Since the coefficient results of the HC, 3.1333 is positive (t = 3.03). As per the Neo-classical

and endogenous growth theories, improvement of human capital has influenced the economic growth (Solow, 1956 and Romer, 1990). Since, this result indicates that every one unit change in HC has increased the average EG by 313% while other predictors in the model constant. Results denote that improvement of secondary and tertiary level education in the population of countries has delivered the expected skills to improve the economic growth of selected economies.

PI, TC and GI are the other channel growth determinants that are not significant in the growth equation. Though financial intermediaries have undertaken the costly process of researching with investment on technology, the financial crisis during the 2007 to 2010 has prevented the results of technological improvement due to the lower manufacturing exports as a share of merchandise export, because the international trade has showed a significant drop during these years. Then the investment on gross fixed capital formation also didn't support to improve the EG. Further, GI also shows the insignificant negative impact due to the lower institutional quality especially among the emerging and lower income countries.

Then the coefficient of II, -3.8333 records the negative significant effect on EG (t = -4.73) to the economic growth. Thus, it shows the conditional convergence in terms of growth among the countries as Levine *et al*., (2000) found to account for growth convergence effect. Then the IFR also shows the negative significant effect (t = -4.73) by the coefficient result of -0.2983 and which highlights the available macroeconomic instability has influenced to economic growth. Further it indicates that every one unit change of the IFR has decreased the average economic growth of selected countries by 29.83% while holding other predictors constant. The coefficient of FDI, 0.3844 (t = 4.11) and AGRP, 0.4554 (t = 2.50) have positively impacted on the economy and which are significant. Results indicate that every unit change of the FDI and AGRP has improved the average economic growth by 38% and 45% respectively while other predictors in the model constant. Since the net foreign investment inflows and population growth have improved the economy, though the countries have undergone a huge financial and economic crisis during period of 2007 to 2010. However, the TO and NRR record the insignificant negative coefficients in

regard to the EG. It indicates through TO and NRR behaved with negative results, the economic growth is not affected.

According to the results of the indirect impact of IM on EG is estimated by the 3SLS, the results indicate that effects of IM are statistically significant on three channel variables except to physical investment (PI). However, the expected positive result records for the physical investment. Though the banking sector lend by way of private credit to deposit money bank in countries, it did not improve gross fixed capital formation, because money did not flow to the capital investment during the period.

IM coefficient towards the HC depicts a significant negative impact. Coefficient result of -0.0060 is significant (t = -5.90) and which is indicates that every one unit change in PCDMB has decreased the average human capital of the selected countries by 0.6%. The population with age 25 or above with secondary and tertiary level of the education which is a proxy variable for the human capital (Barro and Lee, 1993). Results suggest that though banks have disbursed more private credit for the improvement of skills labour, individuals and entrepreneurs just have spent money for the unskilled labour. That is the reason behind slight decrease the population with age 25 or above with secondary and tertiary level of the education by 0.6%. On the other hand, lower funds allocation by the individuals and firms for training and development in developing countries. However the coefficients of TC, II, PAG, TO and ROL are significant towards the HC while GCE indicates the insignificant influence on HC.

The coefficient of the IM on TC shows a positive significant result. The coefficient of IM on TC, 0.1713 (t = 5.65) and it indicates that every additional unit change in bank intermediation has improved average TC towards the economic growth by 17.13% while other predictors in the model constant. Romer, (1990) also found that the manufacturing exports as a share of merchandise export as a proxy variable for technology. According to the results, IM increases the technological improvement by way of private credit for technology improvement and then which has improved the

manufacturing exports as a share of merchandise export in the countries by 21%. Ali, Bajwa and Batool (2016) proved this result and commented that increase in human and physical capital and changes in the technology which cause the increase in the productivity is documented as economic growth. Further, it can be suggested that as a result of developing new goods and services in an economy which creates more demand for that. This is consisted with results of the coefficient of human capital, 14.5643 (t = 5.03) in IM to TC. Kargbo and Adamu (2009) viewed that fostering technological innovation and economic growth by providing basic services such as mobilizing savings, monitoring managers, evaluating investment projects, managing and pooling risks, and facilitating transactions by financial intermediation. The other control variables for TC, II, GCE, IFR, ROL, TOT and PELF also record the significant impact on TC.

The coefficient result of IM on GI indicates a negative significant result recording the coefficient of -9.2589 (t = -8.76) for the selected countries. The results indicate that every unit change in IM have decreased the average estimates of GI by 9.25. In here though the banks increase the private credit, it did not bring the improvement of practices of good governance as a requirement for the development. Further, results show that II is only significant with positive influence while PEE and GCE become insignificant.

Sobel test results indicate that the coefficient of the channel effects of IM through PI, HC, TC and GI on EG. The results indicate that only the HC has brought the influence of bank intermediation by way of PCDMB towards the EG. The coefficient result of the channel effect of HC is -0.0189 and which is significant (t = -2.69). Results indicate effect of the improvement of bank intermediation by way of the private credit to deposit money bank to develop the population with age 25 or above with secondary and tertiary level of the education has discouraged the economic growth. Since, the private credit towards the development of skills labour force in the economies did not bring the expected results to the economic growth or the developed skills may have idle or outdated to fulfil the growth requirements in the economies. Sometimes, the lending to improve the skilled labour may have diverted

to just hiring casual labour and day to day labour expenses rather than training and higher education. However the channel effect of other variables of PI, TC and GI are insignificant and results brought to the economy are insignificant. Thus HC only significantly cared the economic growth effects of IM in the 18 countries.

5.7 Direct and Indirect effect of Bank Broad Access (BA) on Economic Growth

Table 5.6: Results of 3SLS for BA on EG

	Direct Effect Model	Indirect Effect Models			
Variable	**EG**	**PI**	**HC**	**TC**	**GI**
R^2	0.4034	0.6279	0.8969	0.8802	0.5942
Constant	41.0675*	67.5336*	-3.3762*	188.1338*	-9.1473*
	(2.74)	(12.47)	(-7.52)	(14.25)	(-6.94)
BA	-0.2575*	-0.2256*	0.0523*	0.2386	0.0102
	(-3.36)	(-3.27)	(10.89)	(0.84)	(0.58)
PI	-0.0485				
	(-0.31)				
HC	2.8381*			3.2376	
	(2.55)			(0.68)	
TC	-0.0679*		0.0031*		
	(-2.26)		(2.92)		
GI	-0.2159				
	(-0.86)				
GCE	-0.1682	-0.3656*	-0.0018	-0.3306*	-0.0014
	(-1.75)	(-14.55)	(-0.70)	(-4.55)	(-0.17)
II	-1.8970*	-1.3368*	0.3919*	-3.8209*	1.1633*
	(-3.08)	(-1.96)	(7.44)	(-1.96)	(8.69)
IFR	-0.2326*	-0.2336*		-1.1421*	
	(-2.69)	(-2.24)		(-4.55)	
AGRP	0.2559				
	(1.70)				
FDI	0.4275*	0.2275			
	(4.70)	(1.85)			
TO	-0.0323*	-0.0494*	0.0014*	-0.0337*	
	(-3.06)	(-5.98)	(3.17)	(-2.29)	
NRR	-0.2037				
	(-1.18)				
RIR				-0.2937	
				(-1.61)	
ROL		6.3877	-0.4806	-2.0350	
		(1.41)	(-1.67)	(-0.24)	
DMI		0.2240			
		(0.86)			
PAG			0.0322*		
			(4.73)		
AFR				-0.0585	
				(1.16)	
TOT				-0.6462*	
				(-25.48)	
PEE					-0.2563
					(-1.71)
PELF				0.0108	
				(0.18)	
Channel Effect		0.0109	0.1485*	-0.0162	-0.0022
		(0.30)	(2.48)	(-0.78)	(-0.48)

Note: t-statistics. * significance at 5% level.

In here, the results of the direct and indirect impact of BSD development on EG are explored by the BSD indicator of BA. The direct effect of the BA on the EG is measured on the EG model while the indirect effect of BA is measured through the channel variables of PI, TC, HC and GI. The results of the 3SLS estimation are given in above Table 5.6.

According to the results, R^2 results show that the fit of each models. Results indicate that 40% variation in the EG is explained by its predictors. Since, the strength of the fit of the EG model is shown as 40%. Though, the R^2 is reported a lower variance for the EG model, the objective of this section is to explore the direct and indirect effect of the BA on EG. Furthermore, the variations in PI, HC, TC and GI are 63%, 90%, 88% and 59% respectively explained by its relevant predictor variables.

Then initially consider the direct impact of the BA on EG in the model. The coefficient results of the BA, -0.2575 (t = -3.26) shows significant results on the EG. The coefficient result indicates that every additional unit change in CBB has decreased average RGDPG by 25.75% among the selected countries while other factors are constant. Being the CBB is a proxy variable for the banking broad access, it suggests that though countries have opened up the bank branches in the economies incurring huge amount of capital, it consequences didn't influence the economic improvement in short run. It would improve the long term economic growth, when remove the collateral and documentary barriers for the customers to access the financial services. On the other hand Estrada et al., (2010) viewed that while physical access prevents some SMEs from access financial services, limited assets or lack of collateral and documentary requirements for bank lending are additional barriers. Developing more competitive banking systems may improve access of SMEs to financial services. Therefore it seems there were restrictions for the customers for their bank services and uneasy collateral requirements. Scholars (Onaolapo, 2015; Lucchetti, Papi & Zazzaro, 2000; and King & Levine, 1993) provide the further evidences on this.

Then the coefficient results of the channel variables of main growth model show that HC and TC significantly effect on EG. The coefficient results of HC, 2.8381 (t = 2.55) and TC, -0.0679 (-2.26) are evidenced for that. The coefficient results of the HC depict that when increases the one unit in HC has increased average EG by 283% while other predictors in the model constant. This is because the improving banking access in the economies, has given more facilities to draw loans and funds to develop human capital with better education level by the individuals and organizations. On the other hand, the coefficient results of TC indicate that, when increases the TC by one unit, it has decreased the average EG by 6.79% while other predictors in the model constant. It suggests that though the manufacturing exports have been improved by the technology development, because of the lower productivity of the technology towards the manufacturing exports has negatively impacted to the economic growth. When the exports are more intense in technology, the product growth is higher due to higher gains in externality and productivity (Raiher, Carmo & Stege, 2017). On the other hand, consequences of the economic meltdown and financial crisis may have influenced to the manufacturing exports due to the higher inflation and diseconomies of trade of terms then which has discouraged the economic growth. This result confirms by the negative result of the terms of trade and inflation rate among the countries.

However the coefficient results of PI and GI indicates that the effect of such variables on EG is insignificant. Results reveal that though the gross fixed capital formation and governance infrastructure have improved, which were not sufficient to improve the EG in selected countries.

Coefficient of the control variables of main growth model, the II, -1.8970 (t = -3.08), IFR, -0.2326 (t = -2.69), FDI, 0.4275 (t = 4.70) and TO, -0.0323 (t = -3.06) indicate the significant influence towards the economic growth. As per the theories, per capita GDP is a proxy variable for the initial income and which shows a negative effect. Then the IFR also shows it's expected negative result, decreases the real economic growth. Thus, it indicates that the macroeconomic instability among the countries which has negatively influenced to the growth of economies. As expected the

positive signs of FDI and TO, results show that FDI improves the economy with the net investment inflow while exports and imports flow improves the economy. However, GCE, AGRP and NRR are not significant, but the GCE shows the expected negative result which the government size in relation to the private sector (Estrada, Park & Ramayandi, 2010). On the other hand, AGRP shows positive results being the expected results are exaggerated and result implies that due to the favourable motivation caused by increased dependency, and the more favourable attitudes, capacities, and motivations of younger populations compared with older ones improve the economy (Easterlin, 1967). Then the NRR on GDP shows the negative insignificant results against the economic growth. Though the expected sign is positive, results show that the abandon of natural resources in economies which influences negatively.

3SLS estimation results further indicate that effects of BA are statistically significant only on channel variables of PI and HC. When consider the coefficient of BA on PI and HC, results indicates the negative sign for PI while HC shows as expected positive signs, however the coefficients of the TC and GI are insignificant.

Coefficient result of BA on PI, -0.2256 (t = -3.27) indicates that an unfavourable influence towards stabilizing physical investment of the selected countries. According to the results, when increase the BA by one unit, it has decreased the average PI by way of gross fixed capital formation by 22.56% while other predictors in the model constant. Though the bank access has been increased, the prevailed restrictions for financial service access and inefficient information handling have discouraged the development of fixed capital formation. Since, investors couldn't get money for capital projects. Furthermore, the expected services of the commercial banks couldn't achieve due to lack of services and facilities for the suitable private investment on capital projects. If it further emphasis, restriction on loans and collateral problems has discourages the individuals to gain the effective results from the banks. Petersen (1999) stated that efficient information and credit for investment would lead to economic growth. Further result indicates that GCE, II, TO and IFR

have significantly influenced the PI in relation to the economic growth by controlling the effect of BA.

As mentioned above, BA coefficient on human capital, 0.0523 (t = 10.89) indicates that when improve the BA by one unit, it has significantly improved the average HC by 5.23% while other predictors in the model constant. It reflects that improvement of commercial bank branches has influenced to productive usage of the skilled population with primary and secondary education level in economies by 5.23%. Further, it indicates that TC, II, TO and PAG show a significant effect in the model.

The coefficients of BA on TC and GI show the expected positive and negative signs according to the results, but not sufficient to impact on channel variables on TC and GI being the results are insignificant.

Results of Sobel test indicate that the coefficient of the channel effects of BA through PI, HC, TC and GI on EG. The results indicate that only the HC has brought the influence of BA towards the EG. The coefficient result of the channel effect of HC is 0.1485 and which is significant (t = 2.85). Results indicate effect of the improvement of the commercial bank branches to 100,000 adults to develop the population with age 25 or above with secondary and tertiary level of the education have increased the economic growth. Since, the development of skills labour force in the economies has been received the benefit of opening up more commercial bank branches and got the financial access towards the economic growth. The results on the studies done by previous scholars (Kargbo, Ding & Kargbo, 2016; and Greenwood & Jovanovic, 1990) also provide the evidences for this study. Since, organizations and individuals have invested the financial facilities and funds for the development of skill labour to fulfil the growth requirements in the economies. However the channel effect of other variables of PI, TC and GI are insignificant and results brought to the economy are insignificant. Thus HC only significantly cared the economic growth effects of BA in the 18 countries.

5.8 Direct and Indirect effect of Bank Profitability (PF) on Economic Growth

Table 5.7: Results of 3SLS for PF on EG

	Direct Effect Model	Indirect Effect Models			
Variable	**EG**	**PI**	**HC**	**TC**	**GI**
R^2	0.3576	0.5970	0.8300	0.8466	0.5938
Constant	39.5526*	77.4700*	-5.8036*	207.1813*	-9.8108*
	(2.45)	(17.34)	(-10.12)	(13.88)	(-8.57)
PF	0.1134	-0.0231	0.0193	-3.4582*	0.0691
	(0.37)	(-0.05)	(0.43)	(-3.12)	(0.48)
PI	0.0387				
	(0.25)				
HC	2.7585*			14.3228	
	(2.56)			(4.72)	
TC	-0.0368		0.0037*		
	(-1.28)		(2.53)		
GI	-0.0875				
	(-0.34)				
GCE	-0.1168	-0.3826*	-0.0001	-0.4599*	0.0019
	(-1.19)	(-14.64)	(-0.03)	(-5.74)	(0.24)
II	-3.3339*	-2.9811*	0.7848*	-7.6022*	1.2100*
	(-4.17)	(-6.40)	(14.32)	(-3.44)	(9.91)
IFR	-0.2908*	-0.2477*		-1.1394*	
	(-2.96)	(-2.40)		(-4.28)	
AGRP	0.4155*				
	(2.33)				
FDI	0.3837*	0.1835			
	(4.07)	(1.51)			
TO	-0.0114	-0.0357*	-0.0017*	-0.0207	
	(-1.28)	(-4.99)	(3.83)	(-1.58)	
NRR	-0.0790				
	(-0.46)				
RIR				-0.1573	
				(-0.83)	
ROL		10.4734*	-1.1506*	-7.1977	
		(2.38)	(-3.07)	(-0.78)	
DMI		0.0548			
		(0.22)			
PAG			0.0402*		
			(4.72)		
AFR				0.0150	
				(0.29)	
TOT				-0.5999*	
				(-23.66)	
PEE					-0.2350
					(-1.67)
PELF				0.1519	
				(2.67)	
Channel Effect		-0.0009	0.0532	0.1275	-0.0060
		(-0.05)	(0.42)	(1.18)	(-0.27)

Note: t-statistics. * significance at 5% level.

The results of the direct effect of the PF on the EG is measured on the EG model while the indirect effect of PF is measured through the channel variables. 3LSL is given in above Table 5.7.

According to the results, R^2 results show that the fit of each models. Results indicate that 36% variation in the EG is explained by its predictors. Since, the strength of the fit of the EG model is shown as 36%. Though, the R^2 is reported a lower variance for the EG model, the objective of this model is to explore the direct and indirect effect of the PF on EG. Thus the indicated results of the variations in PI, HC, TC and GI are 60%, 83%, 85% and 59% respectively explained by its relevant predictor variables.

The results shows that coefficient of the PF does not significantly influence the economic growth. Since the coefficient of the PF is the 0.1134 (t = 0.37). The PF is a proxy variable for the banking efficiency. Though the results show the expected positive coefficient, the every one unit change of PF didn't change the results of the EG in selected countries, because the banking sector return on assets in the countries are insufficient to increase the economic growth. To explore the impact of BSD on EG, use the indicator of efficiency of the banking sector is more meaningful and such results depict the quality of the finance. Hasan, Koetter and Wedow, (2009) viewed that economic growth benefits receive from more efficient banks. During the period of 2007 to 2010, financial crisis has caused many private commercial banks to traded and amalgamated. Mirzaei, Liu and Moore (2013) found that market concentration has a negative impact on bank profitability and stability while controlling other factors. The efficiency improves both the profitability and stability of individual small banks during the crisis period rather than huge financial conglomeration. It evidenced that though the individual banks have improved its profitability during the crisis time, overall shock of the crisis has brought down the economic growth.

Results of the model of mediate variables effect on economic growth model indicate that HC significantly impact on economic growth. As expected, the positive coefficient of HC, 2.7585 (t = 2.56) is significant. The result evidences that when one

unit change of the HC has increased the EG by 275% while the other predictors in the model are constant. Results indicate that working age population with secondary and tertiary education level has influenced the economic growth in selected countries. Romer (1990) viewed that conjecture that an increase in the labour force can reduce the rate of technological change under appropriate assumptions about the possibilities for substitution between capital goods, physical labour, and skilled human capital, for example in the form of managers. In this scenario, the coefficient of HC indicates a larger proportional impact, because the labour force is competent with skills and trainings. However, the coefficients of PI, TC and GI show the insignificant impact on EG. This indicates that though the gross fixed capital formation (PI), manufacturing exports as a share of merchandise exports (TC) and governance and institutional qualities (NGVI) have did not sufficiently improve the economic growth in selected countries.

Then the coefficient of the control variables in main growth model, II, -3.3339 (t = -4.17), IFR, -0.2908 (t = -2.96), FDI, 0.3837 (t = 4.07) and AGRP, 0.4155 (t = 2.33) indicates the significant results towards the economic growth. II shows the negative significant impact which is in accordance with the conditional convergence growth theories. Then the IFR also shows its expected negative result, decreasing the real economic growth. It shows the macroeconomic instability among the countries which has negatively influenced to the growth of economies. As expected, the positive sign of FDI indicates that which improves the economy. Then the AGRP indicates the positive significant impact on economic growth which depicts that the economies of scale and specialization with motivation of younger population has caused for the economic growth. However, GCE, TO and NRR are not significant on economic growth in main model.

Then 3SLS estimates the channel effect of PF through the channel variables. Results denote that effect of PF is statistically significant only on TC. The coefficient of PI, HC and GI indicate insignificant by the PF. Further the PI indicates a negative sign, while HC and GI indicate the expected positive signs.

The coefficient of PF on TC, -3.4582 is significant (t = -3.12) and it influences on TC in negative way. The coefficient results indicates that every unit change of the PF has decreased the TC by 345% while other predictors in the model constant. This implies that the manufacturing exports as a share of merchandise exports among the countries has been decreased substantial manner due to the lack of implication of technology and innovation. It further evidences that financial crisis has created diverse negative consequences, since the banking sector couldn't focus on productive technological improvement and innovation, being the inflation and terms of trades have negatively impacted to the exports. This further confirms by the negative effect of the trade openness. Therefore it is important to maintain a healthy profitability level move to enable the higher research and development for technological innovations among the economies. Since, King and Levine (1993) confirmed that the financial system affects the rate of technological change by determining the frequency with which society allocates funds to those entrepreneurs with the highest probability of successfully innovating. Further, HC, II, GCE, IFR, TOT and PELF indicate the significant results on TC as the control variables in the models.

As mentioned in the table, the coefficient results of PF on PI, HC and GI are insignificant. Since, results indicate that though the banks return on assets change, it didn't bring the change effect on gross fixed capital formation (PI), working age population with secondary and tertiary education level (HC) and governance infrastructure indicators (NGVI) in the selected countries during this period.

To explore the channel effect of the mediate variables on economic growth, Sobel test result is explored. Test indicates that the coefficient of the channel effects of PF through PI, HC, TC and GI on EG. The results indicate that none of the channel variables are significant. Since, the channel variables didn't care the economic growth effects of PF in these countries.

5.9 Direct and Indirect effect of Bank Liquidity (LQ) on Economic Growth

Table 5.8: Results of 3SLS for LQ on EG

	Direct Effect Model	Indirect Effect Models			
Variable	**EG**	**PI**	**HC**	**TC**	**GI**
R^2	0.3711	0.5964	0.8285	0.8357	0.5950
Constant	36.5140*	78.6085*	-5.5513*	209.0885*	-9.7259*
	(2.20)	(17.06)	(-10.35)	(13.55)	(-9.09)
LQ	0.0092	0.0285	0.0031	0.0253	-0.0078
	(0.40)	(0.87)	(0.97)	(0.31)	(-0.87)
PI	0.0749				
	(0.47)				
HC	2.7274*			14.7323*	
	(2.51)			(4.68)	
TC	-0.0300		0.0042*		
	(-1.06)		(2.93)		
GI	-0.0280				
	(-0.11)				
GCE	-0.1007	-0.3984*	-0.0011	-0.4137*	0.0041
	(-0.99)	(-12.44)	(-0.30)	(-4.66)	(0.48)
II	-3.3158*	-5.1513*	0.7595*	-8.3456*	1.2053*
	(-4.06)	(-6.15)	(13.31)	(-3.65)	(9.91)
IFR	-0.2786*	-0.2425*		-1.2230*	
	(-2.79)	(-2.36)		(-4.46)	
AGRP	0.4017*				
	(2.15)				
FDI	0.3796*	0.1514			
	(3.74)	(1.19)			
TO	-0.0102	-0.0358*	-0.0019*	-0.0261	
	(-1.12)	(-5.00)	(-3.83)	(-1.75)	
NRR	-0.0433				
	(-0.25)				
RIR				-0.2070	
				(-1.06)	
ROL		11.6404*	-1.0045*	-3.3205	
		(2.51)	(-2.52)	(-0.34)	
DMI		0.0965			
		(0.39)			
PAG			0.0370*		
			(4.29)		
AFR				-0.0157	
				(-0.30)	
TOT				-0.6240*	
				(-22.81)	
PEE					-0.2220
					(-1.58)
PELF				0.1139*	
				(2.01)	
Channel Effect		0.0021	0.0085	-0.0007	0.0002
		(0.41)	(0.90)	(-0.29)	(0.10)

Note: t-statistics. * significance at 5% level.

The results of the direct and indirect impact of BSD development on EG are explored by BSD indicator of the LQ. The direct effect of the LQ on the EG is measured on the EG model while the indirect effect of LQ is measured through the channel variables of PI, TC, HC and GI. The results of the 3SLS estimation are given in above Table 5.8.

R^2 results show that the fit of each models. Results indicate that 60% variation in the PI is explained by its predictors. Then 83%, 84% and 59% variations in HC, TC and GI are explained by its relevant predictor variables respectively. The 37% variance in the EG is explained by its explanatory variables.

However, the coefficient of the LQ on economic growth indicates the positive insignificant results of 0.0092 (t = 0.40), but it shows that direct impact of the LQ in selected countries are insufficient to increase the economic growth. BLAD is a proxy variable for the banking stability. Banks that aim at staying in business wish to keep a good reputation concerning its ability to meet liquidity demands. As a result of this, banks may want to keep liquid assets in order to be able to meet large liquidity shocks as suggested by the theory of liquidity assets as a buffer and which a criterion for the banking sector stability. Results indicate that though the LQ has changed it didn't bring changes on economic growth. In this scenario, it suggests that banking sector have met the liquidity requirements of the people by way of short term obligations and withdrawal of deposit, but due to a hidden reason they didn't incur such money for the productive ventures, thus economy didn't grow. On the other hand, when the crisis hit the countries, many mortgage loan became default due to loss of repayment of the customers, then bank got cash problems. This became a one reason for some banks' has collapsed. Alger and Alger (1999) found that banks with relatively more demand deposit have relatively less liquid assets in contrast to theoretical predictions and small banks seem to rely on liquid assets to meet the liquidity shocks. Then banks were not willing to disburse many loans due to the uncertain situation among the economies and loss of the trust on the market, then which has made the crisis worse, economy further came down. By pooling liquidity risk, banks play a growth enhancing role in reducing inefficient liquidation of long

term projects, but they may face liquidity crises associated with severe output losses (Gaytan & Ranciere, 2003).

Results of the channel variables on the main economic growth model indicate that only the HC significantly impact on economic growth. As expected, the positive coefficient of HC, 2.7274 (t = 2.51) indicates that one unit change in HC has improved the average economic growth by 272% while other predictors in the model are constant. The coefficients of other channel variable, PI, TC and GI indicates that the one unit change of such variable, didn't make any change of the results of the EG.

Coefficient results of the control variables in the main growth model, II, -3.3158 (t = -4.06), IFR, -0.2786 (t = -2.79), FDI, 0.3796 (t = 3.74) and AGRP, 0.4017 (t = 2.15) indicate a significant result towards the economic growth with expected signs. II shows a negative significant impact and it is accordance with the conditional convergence growth theories. Then, the IFR influence to decrease the EG. Thus, it shows the macroeconomic instability among the countries which has negatively influenced to the growth of economies. As expected, the positive signs of FDI and AGRP result show that which improves the economic growth. However, GCE, TO and NRR are not significant to the economic growth.

Results further indicate that none of the channel variable shows the significant effect of the ST on EG. Coefficient of LQ on PI, HC and TC indicate the positive insignificant coefficient while it indicates a negative sign for the GI. Being the coefficient of LQ on the channels of PI, HC, TC and GI are insignificant; results confirm that though the changes of one units of ST didn't improves the results of the PI, HC, TC and GI in the selected countries.

To explore the channel effect of the mediate variables on economic growth, Sobel test result is found. Test indicates that the coefficient of the channel effects of LQ through PI, HC, TC and GI on EG. The results indicate that none of the channel

variables are significant. Since, the channel variables did not care the economic growth effects of LQ in these countries.

5.10 Chapter Summary

This chapter illustrated the determinants of the banking sector development and direct and indirect effect of banking sector development on economic growth. Arellano-Bond GMM estimation is used to explore the determinants of the IM, BA and LQ while the System-GMM estimation is used to explore the determinants of the PF. The results indicated that TL has determined the development of four indicators of the banking sector, IM, BA, PF and LQ. Furthermore, results denote that EG has determined three indicators of the BSD in-spite the LQ. While the GI determines the three indicators of the BSD in-spite of the PF, IR has determined the indicators of the BSD without the BA. However results depict that FL became the only determinant of development of LQ. Finally results evidence that the entire variable together determine none of the indicators of the BSD.

Then the 3SLS estimation showed the derived results for the direct and indirect effect of the banking sector development on economic growth. Results summarized that BA has only showed the significant direct effect on the economic growth. However the channel effects is concerned, results denote that only the HC has significantly caring economic growth effects of IM and BA out of four models. The channel effect of the IM on HC indicates that due to the more private credit by the deposit money has flowed to the economy for the investment on education opportunities and business ventures. Since, such ventures have invested to develop more skilled labour by way of trainings and higher education which have ultimately improved the economic growth. On the other hand, channel effect of BA on HC indicates that due to the reliable and easy access to banking facilities, individual and organizations have used the funds from the banks and other banking facilities for the development of the skills and educational opportunities of the labour force. Ultimately this scenario has caused to improve the economic growth of the selected countries.

CHAPTER SIX

CONCLUSION, RECCOMENDATIONS AND SUGGESTIONS

6.1 Conclusion

This chapter draws the conclusions regarding the determinants of the banking sector development, direct and mediate effect of the banking sector development on economic growth.

According to the results, trade liberalization has significantly influenced in developing banking access and banks' profitability. Since, trade openness played a significant role in banking sector development (Gezae, 2015; Harrison, 1994; and Rajan & Zingales, 2003). Same as above, the economic growth also has involved in developing the banking access and banks' profitability. Yu and Gan (2010) and Razal *et al.,* (2014) found that degree of economic development determine the role of its banking sector. Then the governance infrastructure has determined the development of the bank intermediation. The economic crisis in late 2000s caused many countries to suffer politically and economically as a result of weak economic infrastructures at both global and local level on banking sector development (Özkan-Günay, Günay & Günay, 2013; Filippidis & Katrakilidis, 2014; and Donia, 2012). The interest rate level of the countries has influenced in developing the banking intermediation, liquidity and profitability. However, Gezae (2015), Yu and Gan (2010), McKinnon (1973) and Shaw (1973) found that imposing constraints over the banking sector such as interest rate ceilings would result in negative real interest rates to raise. Finally, results of the financial liberalization have only influenced in developing the banking sector liquidity out of the four indicators. Some scholars (Klein & Olivei, 2008; and Ibrahim & Habibullah, 2013) also found that financial liberalization is vital determinants towards the banking sector development.

However, the banking access has significantly influenced in discouraging economic growth. Scholars (Onaolapo, 2015; Lucchetti *et al.,* 2000; and King & Levine, 1993) found that banking access with efficient banking facilities and hassle-free service requirements influences economic improvement. Apart from the direct effect of the banking sector development on economic growth, the potential several

macroeconomic factors in mediating banking sector development is considered with the study. However, out of the four mediators, only human capital development shows the significant mediatory effects. It was evidenced that, developing human capital through banking access and bank intermediation providing credit facilities for education and projects on skill development and trainings, human capital cared a positive and negative mediatory effects on economic growth respectively. However, scholars (Kargbo *et al.,* 2016; and Greenwood & Jovanovic, 1990) also found evidences in supporting this. It further confirms the spill-over effect of human capital in attaining economic development (Romer, 1990).

6.2 Recommendations

In respect to the results of the study, the following recommendations can be given.

In regarding the determinants on BSD, Governments and authorities of the banks in respective economies must monitor the GDP growth in placing sustainable level to further stimulation of bank lending and broad ranges of banking services for the productive ventures in the economies. Further, a special attention must be given on exports and imports of the countries untightening the various barriers and promoting the SME sector for international trade. The good governance practices among bank institutions must be filtered to grass root level of the economies which create the win-win situation among the banks and general public. However, innovative terms must be brought to attract foreign direct investment towards the economies. Further, they must maintain the interest rate level to control the inflation of the countries and to protect the interest of the deposit holders towards a crisis free economy.

Governments and monetary authorities must initiate a healthy public-private partnership to stimulate the economic growth of the countries and encourage the commercial banks to lend on the productive economic activities for large scale entrepreneurs and SME entrepreneurs with hassle free banking services. Further, credit on bank deposits must be further encouraged towards the productive economic activities through innovative banking products.

Authorities must further extend their attention for the development of skilled labour force through innovative trainings programmes providing special financial support via the commercial banks. For this, government must subsidise and monitor the financial support given through modernized banking system.

Banks must be instructed to lend on prioritized growth requirements of the economies; especially for projects in higher level investments as well as micro level technology improvement and technology transformation. Involvement in diverting the long-term funds on infrastructure development projects and promoting good governance practices by the banks must be promoted. Since, it is important to shape the attitudes of general public regarding diverse banking requirements imposed by the banks and monetary authorities towards a healthy banking system.

6.3 Suggestions

There are huge opportunities and requirements to find the new trends behaviour of the banking sector development on economic growth. However, it is important to carry out empirical studies on micro finance sector which has significantly influenced to the development of the economies.

Furthermore, analysis on insurance sector development also a very important area to be considered, because the impact of insurance operations have been given lower concern compare to the finance growth nexus.

However, involving with the studies of cross country panel data are vital and there are plenty of data from the recommended sources. Thus it is important to analyse and doing researches on panel data using proper econometric tool to reveal important findings relating to the macro and micro environment. Since, majority of studies have been done for the entire financial sector rather than its sub categories.

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APPENDIX - A Panel Data for 18 countries with 24 variables from year 2006 to 2014

Country	Year	RGDPG	PCDMB	CBB	BROA	BLAD	PI	TC
Afghanistan	2006	5.55414	4.68822	0.96417	1.64735	70.89000	23.35623	19.49861
	2007	13.74020	4.90393	1.28779	-0.46867	42.16000	19.86494	18.90153
	2008	3.61137	8.29803	1.53165	2.14344	42.00000	18.86967	34.61742
	2009	15.24038	8.86608	2.30099	1.23836	54.16000	17.89225	18.04330
	2010	8.43329	9.83481	2.46329	0.76677	62.56000	17.86878	19.62656
	2011	6.11369	7.28951	2.29004	-0.61966	60.82000	16.55824	14.11812
	2012	14.43474	3.96956	2.21120	0.33516	64.78000	16.81390	16.96402
	2013	1.95912	3.93499	2.34022	0.52748	61.03000	17.23174	14.21934
	2014	1.31253	3.92973	2.39735	0.18033	52.21000	18.23764	14.72194
Australia	2006	2.98287	103.94400	31.24218	2.23274	16.99000	28.03413	23.51028
	2007	3.75766	109.15030	31.67888	1.16921	19.99000	27.77327	24.45420
	2008	3.70670	115.76750	31.57869	0.86254	18.69000	28.76307	20.11516
	2009	1.81968	123.21290	31.23160	0.61036	17.36000	28.20362	19.17727
	2010	2.01818	121.68990	30.74978	0.91023	16.78000	27.73588	16.59950
	2011	2.37956	120.16990	30.36533	0.93869	18.24000	26.69530	14.64972
	2012	3.63272	121.45440	30.21501	0.79474	18.83000	28.01838	15.57290
	2013	2.44005	121.83680	29.53904	0.80577	17.98000	28.25110	14.81122
	2014	2.49985	124.54200	29.17649	0.87722	18.66000	27.33624	15.11106
Bangladesh	2006	6.67187	28.48569	6.92032	-2.25841	11.72000	26.14415	91.33143
	2007	7.05864	29.69958	6.95573	-2.25841	12.85000	26.17850	88.28249
	2008	6.01379	31.13321	7.00503	0.96734	14.46000	26.20227	91.91505
	2009	5.04512	32.83521	7.21713	1.46331	16.87000	26.20606	92.70457
	2010	5.57180	35.60349	7.47090	1.84179	17.62000	26.24666	91.68557
	2011	6.46438	39.25464	7.67272	1.79760	17.87000	27.42097	92.77901
	2012	6.52144	39.68338	7.87027	-0.60306	16.60000	28.26234	92.38972
	2013	6.01360	39.76236	8.03825	1.37174	19.67000	28.38962	92.28476
	2014	6.06109	39.52287	8.22413	0.48546	21.14000	28.57788	92.48450
China	2006	12.71948	102.29140	7.72466	1.06969	14.93000	39.74840	92.37870
	2007	14.23139	97.43145	7.72289	1.27013	18.81000	38.87478	93.07605
	2008	9.65429	96.36049	7.73722	1.01389	22.44000	40.06125	92.98912
	2009	9.39981	109.56540	7.71386	1.09406	18.35000	44.89913	93.57406
	2010	10.63614	128.29750	7.71758	1.24305	15.73000	44.99120	93.55065
	2011	9.53644	118.91700	7.78024	0.70413	20.81000	44.89488	93.29944
	2012	7.85626	121.23210	7.64376	1.39224	25.98000	45.26563	93.93434
	2013	7.75764	126.71460	7.72873	1.13368	22.25000	45.51477	94.02167
	2014	7.29767	132.95020	7.96822	0.76481	16.10000	45.04112	93.99402

Country	Year	RGDPG	PCDMB	CBB	BROA	BLAD	PI	TC
India	2006	9.26396	38.44168	8.89578	0.97977	10.91000	31.28907	66.25703
	2007	8.60820	41.02541	9.00610	1.01889	11.83000	35.57015	64.20260
	2008	3.89096	44.37484	9.31294	1.13988	11.09000	34.95154	62.78339
	2009	8.47978	44.52106	9.60198	0.98862	9.68000	34.29191	66.81665
	2010	10.25996	44.05978	10.03761	1.09532	8.44000	33.41376	63.76402
	2011	6.63836	47.79597	10.51198	1.07555	9.42000	34.31326	62.22553
	2012	5.48402	48.70382	11.18509	0.97933	7.88000	33.38462	64.77094
	2013	6.54030	49.61748	11.85445	0.98819	7.55000	31.24692	61.87681
	2014	7.17943	49.61802	12.87162	0.75127	7.86000	30.26020	64.00565
Indonesia	2006	5.50095	22.54074	5.72028	1.67681	36.93000	24.13099	44.68730
	2007	6.34502	22.68064	5.97007	1.80146	36.18000	24.94694	42.92987
	2008	6.01370	23.41982	6.58366	1.14118	28.18000	27.69859	38.81244
	2009	4.62887	23.99283	7.64727	1.89370	30.30000	31.11477	40.58097
	2010	6.22385	22.29731	8.12407	2.18882	30.13000	30.99941	37.49779
	2011	6.16978	24.07142	14.74011	2.28413	30.48000	31.30745	34.16080
	2012	6.03005	27.26244	16.92653	2.33274	28.31000	32.71963	36.17690
	2013	5.55726	29.83440	17.72089	2.09774	23.08000	31.96578	37.80095
	2014	5.02389	30.74298	17.93057	2.11080	22.84000	32.57701	40.93542
Japan	2006	1.41998	99.69073	34.11281	0.50114	10.42000	24.71762	91.02499
	2007	1.65428	97.95601	33.89569	0.43556	9.80000	24.11780	90.08740
	2008	-1.09348	101.76720	33.84024	0.27905	11.03000	23.96231	89.22586
	2009	-5.41712	107.89150	33.79883	-0.13484	10.53000	22.36136	88.03425
	2010	4.19229	104.81570	33.79300	0.21927	9.91000	21.32970	88.99813
	2011	-0.11546	106.03020	33.87113	0.25632	11.12000	21.90389	89.09016
	2012	1.49503	105.93830	33.92434	0.27742	10.10000	22.41927	89.56120
	2013	2.00049	107.44320	33.88856	0.29260	11.54000	23.32814	88.19388
	2014	0.33566	109.61500	33.88086	0.31377	15.98000	23.93173	88.23686
Korea, Rep	2006	5.17613	83.14558	17.82439	-0.06996	37.74000	30.74047	89.45732
	2007	5.46341	87.05186	18.36036	0.48900	10.22000	30.51392	89.21067
	2008	2.82921	94.16575	18.78761	0.03469	11.21000	31.38203	86.91452
	2009	0.70752	97.25165	18.28889	0.17796	5.44000	31.31846	89.59162
	2010	6.49679	91.70688	18.26218	1.22772	10.00000	30.50037	88.96672
	2011	3.68170	91.58608	18.31289	0.89141	11.36000	30.24319	85.93090
	2012	2.29238	91.03187	18.41195	0.59967	10.92000	29.56949	85.08231
	2013	2.89622	111.82260	18.11816	0.39473	12.16000	29.26230	86.23528
	2014	3.34145	135.14990	17.33287	0.13669	9.87000	29.15494	86.79530

Country	Year	RGDPG	PCDMB	CBB	BROA	BLAD	PI	TC
Malaysia	2006	5.58485	100.64360	11.72652	0.45413	13.13000	21.95505	73.67856
	2007	9.42767	96.93298	11.43315	0.61987	17.22000	22.40433	71.04948
	2008	3.31959	93.73731	11.23250	0.45635	23.23000	20.57046	54.35368
	2009	-2.52583	107.57460	11.07814	0.81163	28.20000	21.97641	69.91224
	2010	6.98096	101.68710	10.86363	1.07312	30.30000	22.43528	67.20400
	2011	5.29379	102.82030	11.20357	2.89605	22.36000	22.18314	62.17695
	2012	5.47439	107.91030	11.11633	1.72985	25.07000	25.36358	61.74301
	2013	4.69292	114.10110	10.91227	1.46479	22.72000	26.47708	60.77790
	2014	6.01217	115.48400	10.76383	1.00788	16.66000	25.97613	61.80182
Nepal	2006	3.36461	28.44677	2.60553	1.81179	34.65000	20.72089	70.03811
	2007	3.41156	32.11969	3.58491	1.84522	28.70000	21.06778	69.85152
	2008	6.10464	36.44630	3.56974	2.15480	25.64000	21.87755	69.56715
	2009	4.53308	45.69767	4.70017	2.29746	27.34000	21.35434	66.51299
	2010	4.81641	51.25075	5.19381	2.03453	24.43000	22.20773	71.89854
	2011	3.42183	50.05305	7.37277	1.72344	23.99000	21.41477	73.82534
	2012	4.78119	51.66027	8.39822	1.41653	22.64000	20.76710	68.57314
	2013	4.12888	53.76948	8.31299	1.68558	18.08000	22.59406	68.73198
	2014	5.98898	56.45940	8.41887	1.67666	18.54000	23.51764	67.86090
Pakistan	2006	6.17754	26.70662	7.92351	1.11516	20.59000	17.73199	81.30726
	2007	4.83282	27.22095	8.17618	0.08703	19.41000	17.18706	79.53997
	2008	1.70141	28.14353	8.52263	-1.18425	15.68000	17.60585	73.45369
	2009	2.83166	22.98101	8.60087	-0.71020	13.15000	15.94948	76.39121
	2010	1.60669	20.98225	8.63662	-1.38443	13.30000	14.20456	74.09039
	2011	2.74840	17.83776	8.81397	0.08252	12.63000	12.52063	71.50548
	2012	3.50703	16.92592	9.05990	2.33102	14.11000	13.47596	75.80581
	2013	4.39646	15.68377	9.38529	1.10436	14.83000	13.35733	74.01006
	2014	4.67471	15.11247	9.66237	1.50337	12.37000	13.03527	74.82572
Russia	2006	8.15343	25.99917	30.35482	2.49020	40.51000	18.50341	16.48457
	2007	8.53508	31.54588	33.70150	2.15951	43.25000	20.99526	16.95656
	2008	5.24795	35.74767	35.56203	1.93203	43.31000	22.29049	16.73590
	2009	-7.82089	44.93548	34.62967	1.00944	51.89000	21.99515	17.20857
	2010	4.50373	40.17754	35.04582	0.39158	51.39000	21.62540	14.09774
	2011	4.26418	40.36208	36.70921	1.11135	51.28000	19.99393	13.20720
	2012	3.51794	43.71258	38.20561	1.33789	47.45000	20.20399	16.30239
	2013	1.27945	48.64885	38.47196	1.39107	45.73000	20.21580	16.58182
	2014	0.73146	53.40701	36.98869	0.98837	44.21000	21.24769	17.37361

Country	Year	RGDPG	PCDMB	CBB	BROA	BLAD	PI	TC
Singapore	2006	8.86020	82.54807	11.14333	1.54485	44.99000	23.06062	79.51918
	2007	9.11153	78.87592	10.75545	1.27050	37.65000	24.48138	76.38747
	2008	1.78762	93.11570	10.32972	1.28435	28.15000	28.33759	70.41970
	2009	-0.60339	96.59931	10.21648	1.04794	34.74000	29.27099	74.21698
	2010	15.24038	90.89501	10.22326	1.28956	32.85000	26.12747	73.12927
	2011	6.20745	98.35732	9.96581	1.05709	27.97000	25.56583	68.66919
	2012	3.67014	108.49160	9.77140	1.26578	19.10000	26.76273	69.76192
	2013	4.67548	117.91520	9.50703	1.06381	21.56000	27.92328	70.62124
	2014	3.26002	127.07030	9.38906	0.92489	22.91000	26.54772	71.29422
Sri Lanka	2006	7.66829	30.56968	11.85685	0.92610	39.39000	24.87205	70.77137
	2007	6.79683	30.39753	13.06364	1.07216	37.14000	24.72102	68.03233
	2008	5.95009	29.26773	13.83836	0.90060	25.16000	25.28657	67.13185
	2009	3.53891	25.31250	14.59054	0.96912	28.08000	23.73052	67.34174
	2010	8.01596	23.80939	15.50646	1.24745	9.34000	24.46425	66.52746
	2011	8.40474	26.75334	16.85848	1.57682	14.70000	28.23950	69.17714
	2012	9.14458	28.97259	18.09380	1.74175	14.05000	29.89166	68.96966
	2013	3.39571	28.43052	18.44279	1.41997	16.24000	30.06912	69.84284
	2014	4.87860	27.24486	18.65158	1.25901	18.27000	27.30891	67.67752
Thailand	2006	4.96792	93.95560	9.10137	0.76616	17.87000	26.84661	75.95013
	2007	5.43509	89.52483	9.73997	0.17104	17.33000	25.45621	76.83830
	2008	1.72567	93.13215	10.35865	0.91373	19.53000	26.44773	73.91384
	2009	-0.73828	95.92780	10.86318	0.99370	18.27000	23.12011	74.63004
	2010	7.50671	92.17236	11.09106	1.20178	17.47000	24.00548	75.32976
	2011	0.83368	101.91730	11.42099	1.13853	16.11000	25.85105	71.95125
	2012	7.23096	100.12480	11.76878	1.15736	17.75000	27.00692	73.77315
	2013	2.70212	106.86020	12.17588	1.37496	17.26000	25.42252	74.94717
	2014	0.81763	113.42710	12.60891	1.37044	18.89000	24.82051	76.28822
UAE	2006	9.83732	41.43376	13.95817	2.84244	30.42000	17.57911	4.48882
	2007	3.18439	56.03238	13.09242	2.32440	32.68000	23.57303	3.12335
	2008	3.19184	58.51852	12.92727	1.72630	17.65000	22.37393	4.01790
	2009	-5.24292	83.54062	12.19147	1.26129	20.77000	28.91298	6.32523
	2010	1.63545	74.88027	11.90936	1.44291	24.18000	24.99447	6.25474
	2011	5.20780	62.68808	11.75012	1.57135	21.94000	21.42704	6.56293
	2012	6.79262	60.14924	11.94322	1.67276	24.50000	21.90744	6.15801
	2013	4.72890	59.53558	12.36615	1.71695	21.30000	21.71074	6.04327
	2014	3.07988	62.05786	11.86033	1.95374	22.13000	22.82530	7.48751

Country	Year	RGDPG	PCDMB	CBB	BROA	BLAD	PI	TC
UK	2006	2.50301	151.05910	26.45099	0.64051	55.24000	17.59743	77.02139
	2007	2.55582	164.08950	26.42115	0.86718	39.79000	18.04983	72.94189
	2008	-0.62721	187.15330	26.08414	0.04728	36.27000	17.33429	68.16152
	2009	-4.32774	202.19960	25.47455	-0.05027	49.32000	15.57021	66.51784
	2010	1.91516	190.24250	24.75898	-0.02289	51.51000	15.62458	68.43904
	2011	1.50906	179.87050	24.12211	0.05354	49.45000	15.67494	63.37278
	2012	1.31302	168.22030	22.13842	-0.29911	54.56000	15.92561	66.36867
	2013	1.91108	157.97580	25.19268	0.08789	54.73000	16.10887	68.63510
	2014	3.07048	144.95860	23.81773	0.27142	42.68000	16.59799	73.82201
USA	2006	2.66663	55.15097	33.75201	1.27243	19.50000	22.84966	79.15333
	2007	1.77857	57.43963	34.57786	0.87520	22.60000	22.11339	77.57774
	2008	-0.29162	60.74443	34.96290	0.10139	25.64000	21.00362	74.04306
	2009	-2.77553	57.59837	35.70800	0.13318	20.75000	18.53639	66.78708
	2010	2.53192	51.53658	35.21670	0.65648	20.42000	17.98343	66.15531
	2011	1.60145	50.39451	34.93094	0.82398	19.54000	18.27563	63.52946
	2012	2.22403	49.05528	34.67212	0.99075	20.51000	18.96811	63.42808
	2013	1.67733	48.68451	33.42676	1.05220	20.93000	19.20865	62.31348
	2014	2.37046	50.53301	32.22227	1.02249	21.07000	19.63723	61.96733

Country	Year	HC	NGVI	GCE	lnPGDP	IFR	TO	AFR
Afghanistan	2006	0.45500	-3.5071698	124.25853	5.63567	7.25490	100.55535	123.16160
	2007	0.45500	-3.573829	120.66139	5.94123	8.48289	76.17376	117.39000
	2008	0.45500	-3.7311607	118.20990	5.95099	15.84211	73.06552	111.47080
	2009	0.45500	-3.7780684	109.59939	6.12895	-1.35284	56.90682	105.55160
	2010	0.52000	-3.709042	117.05085	6.34553	0.89254	54.96733	99.63240
	2011	0.52000	-3.6476338	121.52844	6.43355	10.20166	50.30122	93.71320
	2012	0.52000	-3.2906446	116.81164	6.53791	7.21826	44.65925	87.79400
	2013	0.52000	-3.3197884	126.21814	6.48211	7.65432	56.06567	82.26380
	2014	0.52000	-3.1184223	121.36702	6.45197	4.60433	52.87356	76.73360
Australia	2006	2.86000	3.5099376	74.12449	10.49363	3.53849	41.01725	17.06380
	2007	2.86000	3.5649288	73.74155	10.62030	2.33236	41.40257	17.10000
	2008	2.86000	3.6047368	73.45325	10.81231	4.35264	42.11824	16.78540
	2009	2.86000	3.5509786	71.97366	10.66231	1.82011	44.94695	16.47080
	2010	2.94500	3.5563725	73.40355	10.85603	2.84523	39.86036	16.15620
	2011	2.94500	3.6251214	71.83442	11.03838	3.30385	41.24351	15.84160
	2012	2.94500	3.5852866	71.77109	11.12205	1.76278	42.69560	15.52700
	2013	2.94500	3.4987547	72.82238	11.12214	2.44989	40.88920	14.96600
	2014	2.94500	3.5828741	73.26859	11.03497	2.48792	42.30167	14.40500
Bangladesh	2006	0.79000	-2.0780441	79.26085	6.20628	6.76526	38.11192	96.09960
	2007	0.79000	-1.9006873	79.77322	6.29726	9.10698	39.94238	93.57700
	2008	0.79000	-1.8253305	81.10093	6.42661	8.90194	42.62091	91.93560
	2009	0.79000	-1.8097913	80.00647	6.52739	5.42347	40.09280	90.29420
	2010	1.02000	-1.7412688	79.50796	6.63376	8.12668	37.80284	88.65280
	2011	1.02000	-1.7250754	80.15573	6.73167	10.70480	47.42085	87.01140
	2012	1.02000	-1.8249597	79.52541	6.75569	6.21818	48.11092	85.37000
	2013	1.02000	-1.8793339	78.83103	6.86108	7.52997	46.29640	84.43000
	2014	1.02000	-1.6385995	77.95688	6.99099	6.99117	44.51408	83.49000
China	2006	0.96000	-1.1444251	50.33554	7.64933	1.46319	65.61892	7.91360
	2007	0.96000	-1.0592927	49.30499	7.89929	4.75030	62.66474	7.85500
	2008	0.96000	-0.9801955	49.64275	8.15227	5.86438	56.95747	7.78820
	2009	0.96000	-1.0108111	49.34930	8.25282	-0.70295	44.50696	7.72140
	2010	1.02000	-1.105227	48.74220	8.42519	3.31455	48.88930	7.65460
	2011	1.02000	-1.0829274	49.92533	8.63654	5.41085	50.59983	7.58780
	2012	1.02000	-1.1112541	50.05694	8.75430	2.62492	48.10786	7.52100
	2013	1.02000	-1.0734489	50.16753	8.86471	2.62712	46.56524	7.43440
	2014	1.02000	-0.875087	50.48417	8.94683	1.99685	45.65192	7.34780

Country	Year	HC	NGVI	GCE	lnPGDP	IFR	TO	AFR
India	2006	1.12000	-0.256821	67.28716	6.70531	6.14552	45.29779	47.71220
	2007	1.12000	-0.3131743	61.68123	6.92572	6.37000	46.16020	44.58900
	2008	1.12000	-0.3649439	67.00976	6.89923	8.35182	53.76515	41.75900
	2009	1.12000	-0.4788892	64.90339	6.99426	10.87739	46.77858	38.92900
	2010	1.27500	-0.5081255	63.83987	7.20469	11.99230	49.69054	36.09900
	2011	1.27500	-0.5748779	66.96577	7.28713	8.85785	55.62572	33.26900
	2012	1.27500	-0.6714184	68.45120	7.27709	9.31245	55.77901	30.43900
	2013	1.27500	-0.6326055	68.78279	7.28038	10.90764	53.82921	28.05680
	2014	1.27500	-0.5529123	68.81173	7.35879	6.64950	49.05605	25.67460
Indonesia	2006	0.80000	-1.2550381	69.18748	7.37160	13.10942	56.65713	51.40200
	2007	0.80000	-1.0361245	71.03753	7.52867	6.40745	54.82925	51.50500
	2008	0.80000	-0.9640636	71.12859	7.68149	9.77659	58.56140	51.50500
	2009	0.80000	-0.9427701	66.20869	7.72432	4.81352	45.51212	51.50500
	2010	1.17500	-0.9701866	65.22309	8.04726	5.13275	46.70127	51.50500
	2011	1.17500	-0.8898614	64.54097	8.20183	5.35750	50.18001	51.50500
	2012	1.17500	-0.7651407	65.32255	8.21623	4.27951	49.58290	51.50500
	2013	1.17500	-0.6648228	66.95886	8.19745	6.41339	48.63737	50.75300
	2014	1.17500	-0.405306	66.22104	8.16040	6.39493	48.05727	50.00100
Japan	2006	2.65500	2.7859476	73.83735	10.47543	0.24936	30.33178	5.25980
	2007	2.65500	2.6169671	73.62383	10.47094	0.06004	33.09389	5.12500
	2008	2.65500	2.6072353	75.00312	10.57998	1.38008	34.39902	5.00680
	2009	2.65500	2.6704514	78.12538	10.61779	-1.35284	24.49090	4.88860
	2010	2.80500	2.7299006	77.24201	10.70342	-0.71998	28.61301	4.77040
	2011	2.80500	2.7709756	78.43971	10.78257	-0.26763	30.39300	4.65220
	2012	2.80500	2.7932473	78.89220	10.79198	-0.05194	30.63612	4.53400
	2013	2.80500	2.9313015	79.12582	10.60877	0.34644	34.14752	4.34620
	2014	2.80500	3.0767901	78.58284	10.54900	2.76195	37.55878	4.15840
Korea, Rep	2006	2.82500	-3.3635692	66.51815	9.94832	2.24185	73.55135	2.11420
	2007	2.82500	-3.2483924	66.29413	10.04765	2.53485	77.24302	2.09300
	2008	2.82500	-3.1426691	66.99223	9.92695	4.67380	99.93354	2.03400
	2009	2.82500	-3.2752449	66.84746	9.81677	2.75669	90.41264	1.97500
	2010	3.08500	-3.4229955	64.79223	10.00565	2.93918	95.65409	1.91600
	2011	3.08500	-3.4301216	65.54627	10.09228	4.02585	110.00005	1.85700
	2012	3.08500	-3.3690582	66.20448	10.10455	2.18722	109.88622	1.79800
	2013	3.08500	-3.5202846	65.91839	10.16577	1.30138	102.77075	1.72820
	2014	3.08500	-3.5742997	65.46925	10.23958	1.27471	95.29722	1.65840

Country	Year	HC	NGVI	GCE	lnPGDP	IFR	TO	AFR
Malaysia	2006	1.96000	0.9392054	55.50275	8.73144	3.60924	202.57765	12.87220
	2007	1.96000	0.881399	56.71927	8.88747	2.02735	192.46611	12.83800
	2008	1.96000	0.5727914	56.21066	9.04624	5.44078	176.66859	12.82280
	2009	1.96000	0.5309064	61.88971	8.89727	0.58331	162.55905	12.80760
	2010	2.26500	0.8285806	60.69788	9.11262	1.71004	157.94501	12.79240
	2011	2.26500	0.7562829	61.23854	9.25223	3.20000	154.93779	12.77720
	2012	2.26500	0.8042175	63.49337	9.29051	1.64729	147.84180	12.76200
	2013	2.26500	0.909427	65.51684	9.30305	2.09724	142.72113	13.08020
	2014	2.26500	1.1814574	65.70875	9.33308	3.17460	138.30945	13.39840
Nepal	2006	0.57000	-1.8069163	91.01690	5.85967	6.92034	44.76199	97.26480
	2007	0.57000	-1.7053261	90.18269	5.98184	5.74591	44.57928	93.83200
	2008	0.57000	-1.762707	90.16892	6.16659	9.87840	46.03621	90.06640
	2009	0.57000	-1.8130174	90.56636	6.18085	11.07765	47.07945	86.30080
	2010	0.62500	-1.8355166	88.54863	6.38928	9.32400	45.98491	82.53520
	2011	0.62500	-1.7905475	86.03296	6.54182	9.27171	41.82825	78.76960
	2012	0.62500	-1.8706401	89.01335	6.54881	9.45418	43.65821	75.00400
	2013	0.62500	-1.6785066	89.44649	6.54640	9.04268	48.14600	73.76540
	2014	0.62500	-1.4145793	88.07721	6.55562	8.36798	52.25520	72.52680
Pakistan	2006	1.07000	-1.8034262	88.08180	6.77645	7.92108	35.68173	42.48040
	2007	1.07000	-2.020695	87.77413	6.86045	7.59868	32.99043	41.61600
	2008	1.07000	-2.1995016	91.62373	6.94967	15.84211	35.59420	41.45760
	2009	1.07000	-2.288119	89.73086	6.91751	13.64777	32.07185	41.29920
	2010	1.07000	-2.2541491	90.03183	6.95014	13.88114	32.86893	41.14080
	2011	1.07000	-2.4046021	90.88594	7.11465	11.91677	32.93991	40.98240
	2012	1.07000	-2.388019	92.93622	7.14275	9.68505	32.80550	40.82400
	2013	1.07000	-2.2820376	91.82196	7.15156	7.68950	33.33360	39.99000
	2014	1.07000	-2.0985153	91.78081	7.18581	7.19167	30.90124	39.15600
Russia	2006	3.08500	-1.5313424	66.10086	8.84220	9.68711	54.73340	28.95540
	2007	3.08500	-1.488493	67.21347	9.11617	8.99133	51.70614	29.29100
	2008	3.08500	-1.495246	65.26208	9.36180	14.11223	53.38253	28.81780
	2009	3.08500	-1.5246592	73.63247	9.05518	11.66055	48.43508	28.34460
	2010	3.19500	-1.5193063	69.30931	9.27566	6.85235	50.35555	27.87140
	2011	3.19500	-1.5181328	68.78210	9.56185	8.43522	48.37003	27.39820
	2012	3.19500	-1.5115279	70.27845	9.62605	5.07020	47.98029	26.92500
	2013	3.19500	-1.4531142	73.25292	9.65141	6.76250	47.63695	25.52760
	2014	3.19500	-1.3710881	71.35215	9.55577	7.82603	47.69894	24.13020

Country	Year	HC	NGVI	GCE	lnPGDP	IFR	TO	AFR
Singapore	2006	1.82000	3.2054877	47.82728	10.42168	1.02092	430.35761	6.27700
	2007	1.82000	3.3137195	46.05320	10.57703	2.09514	398.65781	5.96100
	2008	1.82000	3.425439	48.68082	10.58964	6.51859	439.65668	5.55060
	2009	1.82000	3.2924386	48.80479	10.56043	0.60362	360.23072	5.14020
	2010	2.85500	3.3112738	45.71163	10.74870	2.80000	372.09936	4.72980
	2011	2.85500	3.3199715	45.81227	10.87981	5.25292	374.70245	4.31940
	2012	2.85500	3.5296046	46.58796	10.90506	4.52865	367.13546	3.90900
	2013	2.85500	3.4595288	46.57073	10.92626	2.37849	361.59132	3.87120
	2014	2.85500	3.5384612	46.62660	10.93324	1.01010	359.77345	3.83340
Sri Lanka	2006	1.84000	-0.636883	83.02421	7.27846	10.02018	71.26118	23.41200
	2007	1.84000	-0.7436563	82.42437	7.40538	15.84211	68.60651	22.28900
	2008	1.84000	-0.9033425	86.13369	7.62778	15.84211	63.36904	21.38660
	2009	1.84000	-0.83974	82.05854	7.65287	3.46496	49.14914	20.48420
	2010	1.84000	-0.7285014	76.90677	7.94432	6.21765	46.36389	19.58180
	2011	1.84000	-0.5910571	79.82703	8.07744	6.71677	54.98459	18.67940
	2012	1.84000	-0.5991269	72.80358	8.11687	7.54291	51.49209	17.77700
	2013	1.84000	-0.6309785	75.36759	8.19154	6.91155	49.25779	16.56900
	2014	1.84000	-0.4765242	76.02825	8.25654	3.27783	49.83087	15.36100
Thailand	2006	1.00000	-0.449144	69.72465	8.11705	4.63747	134.08677	42.33360
	2007	1.00000	-0.466434	66.63271	8.28469	2.24154	129.87314	42.44000
	2008	1.00000	-0.5574214	69.37773	8.38590	5.46849	140.43697	42.89140
	2009	1.00000	-0.5452466	69.99289	8.35023	-0.84572	118.87724	43.34280
	2010	1.16500	-0.6136775	69.09144	8.53933	3.24759	126.75724	43.79420
	2011	1.16500	-0.4731399	71.48457	8.61966	3.80982	138.86446	44.24560
	2012	1.16500	-0.4540724	71.12067	8.68528	3.02000	137.76526	44.69700
	2013	1.16500	-0.4970898	69.91534	8.73634	2.18404	132.75313	44.66640
	2014	1.16500	-0.5036824	69.31323	8.69449	1.89038	131.95651	44.63580
UAE	2006	1.94500	1.0647938	62.94276	10.66779	9.30000	119.47641	29.00980
	2007	1.94500	1.1588751	66.93634	10.66695	11.10000	136.79815	29.87200
	2008	1.94500	1.1092461	65.67964	10.73029	12.30000	148.51354	29.42260
	2009	1.94500	1.1346578	62.52183	10.40138	1.60000	153.46194	28.97320
	2010	1.95000	0.9291191	66.10752	10.44412	0.90000	151.00043	28.52380
	2011	1.95000	1.1922993	58.55822	10.59416	0.90000	162.62623	28.07440
	2012	1.95000	1.312649	51.54157	10.63855	0.70000	175.95953	27.62500
	2013	1.95000	1.4391229	51.46966	10.66865	1.10000	176.41816	28.43940
	2014	1.95000	1.5615678	54.57437	10.69735	2.30000	173.35534	29.25380

Country	Year	HC	NGVI	GCE	lnPGDP	IFR	TO	AFR
UK	2006	2.64500	3.4095805	84.45107	10.69232	2.33353	56.03698	25.82060
	2007	2.64500	3.2974643	84.10853	10.81876	2.32104	52.33740	25.62500
	2008	2.64500	3.1919217	85.60424	10.74771	3.61350	56.75486	24.12060
	2009	2.64500	2.9585599	87.52714	10.54561	2.16623	54.72441	22.61620
	2010	3.22000	3.1183681	86.73239	10.56382	3.28571	59.22182	21.11180
	2011	3.22000	3.0351452	85.80325	10.62724	4.48424	62.70652	19.60740
	2012	3.22000	3.104463	86.14030	10.63437	2.82171	61.82620	18.10300
	2013	3.22000	3.1617018	85.54798	10.65508	2.55455	61.76965	16.71860
	2014	3.22000	3.2895029	84.57876	10.74532	1.46019	58.13677	15.33420
USA	2006	3.59500	2.8938528	82.23102	10.74585	3.22594	26.87362	40.37540
	2007	3.59500	2.8321881	82.61176	10.78024	2.85267	27.95893	39.66900
	2008	3.59500	2.9405961	84.12637	10.78728	3.83910	29.94141	37.73980
	2009	3.59500	2.728072	85.22958	10.75794	-0.35555	24.76583	35.81060
	2010	3.73500	2.7937362	85.03125	10.78672	1.64004	28.18245	33.88140
	2011	3.73500	2.8259652	85.19282	10.81540	3.15684	30.88516	31.95220
	2012	3.73500	2.8421064	84.15080	10.84804	2.06934	30.71463	30.02300
	2013	3.73500	2.7471386	83.18537	10.87332	1.46483	30.22626	27.06660
	2014	3.73500	2.7399915	82.91171	10.90668	1.62222	30.23816	24.11020

Country	Year	FDI	TOT	RIR	PELF	DMI	PEE	ROL
Afghanistan	2006	3.372252	126.60173	10.07615	8.70000	2.67000	1.69000	0.12200
	2007	1.9168328	128.70076	-8.58837	8.70000	2.68000	1.69000	0.14900
	2008	0.4517306	128.58200	12.46673	8.70000	3.06000	1.69000	0.14200
	2009	1.581754	138.85787	17.47530	8.70000	3.02000	1.69000	0.15800
	2010	0.3400968	143.83398	5.71302	8.70000	2.48000	2.19000	0.14700
	2011	0.3213613	144.69877	4.14675	8.70000	2.48000	2.19000	0.15200
	2012	0.2299646	138.21219	6.18185	8.70000	2.48000	2.19000	0.18700
	2013	0.1877579	138.18652	9.89484	8.70000	2.48000	2.19000	0.26000
	2014	0.2170063	140.79555	14.72114	8.70000	2.77000	2.19000	0.34000
Australia	2006	4.0867067	145.51612	2.42300	29.40000	9.16000	5.82000	0.91000
	2007	5.2051923	152.39124	3.06592	28.30000	9.14000	5.82000	0.87800
	2008	4.2792129	174.63050	4.18080	27.30000	9.09000	5.82000	0.88300
	2009	3.0936418	162.97564	1.04327	28.33000	9.09000	5.82000	0.88100
	2010	3.0808863	178.90016	6.20869	27.98000	9.22000	5.88000	0.88100
	2011	4.71429	200.43269	1.46031	27.87000	9.22000	5.88000	0.88200
	2012	3.7414272	181.99113	4.81999	28.06000	9.22000	5.88000	0.87400
	2013	3.4455102	176.99160	6.39128	27.97000	9.13000	5.88000	0.83000
	2014	3.1501003	165.07405	4.47315	28.06000	9.01000	5.88000	0.80000
Bangladesh	2006	0.6356572	75.16065	5.46696	22.80000	5.85000	2.61000	0.26600
	2007	0.8177544	68.05697	5.78915	22.80000	5.84000	2.61000	0.31200
	2008	1.4497484	58.74180	4.66174	22.80000	6.11000	2.61000	0.32300
	2009	0.8794945	66.98810	6.14654	22.80000	5.52000	2.61000	0.32000
	2010	1.0689349	60.97237	4.73614	22.80000	5.87000	2.87000	0.31900
	2011	0.9831665	56.26109	5.06420	22.80000	5.86000	2.87000	0.32400
	2012	1.1881028	60.38985	5.34331	22.80000	5.86000	2.87000	0.32300
	2013	1.7354185	59.64622	5.98868	22.80000	5.86000	2.87000	0.40000
	2014	1.4687129	59.39621	6.88590	22.80000	5.78000	2.87000	0.39000
China	2006	4.5085785	89.43343	2.10923	29.30000	3.05000	4.94000	0.39800
	2007	4.3986852	88.50709	-0.31076	29.30000	3.04000	4.94000	0.39600
	2008	3.7304695	83.77534	-2.33464	29.30000	2.97000	4.94000	0.41200
	2009	2.5647403	91.05593	5.45117	29.30000	3.04000	4.94000	0.41300
	2010	3.994732	82.01435	-1.06077	29.30000	3.14000	5.07000	0.40800
	2011	3.6985171	79.01382	-1.47215	29.30000	3.14000	5.07000	0.40500
	2012	2.817739	79.72001	3.52324	29.30000	3.00000	5.07000	0.40300
	2013	3.0282257	81.76201	3.69259	29.30000	3.00000	5.07000	0.48000
	2014	2.5576005	83.96037	4.73243	29.30000	3.00000	5.07000	0.45000

Country	Year	FDI	TOT	RIR	PELF	DMI	PEE	ROL
India	2006	2.1763294	85.70074	4.47735	31.60000	7.55000	2.58000	0.49500
	2007	2.1003658	81.60531	9.01951	31.60000	7.60000	2.58000	0.46800
	2008	3.6569507	81.60531	4.27723	31.60000	7.68000	2.58000	0.47300
	2009	2.6875361	95.01265	5.77357	31.60000	7.80000	2.58000	0.45500
	2010	1.653785	93.47190	-0.59685	31.60000	7.28000	2.83000	0.44500
	2011	2.0020656	89.99280	1.49895	31.60000	7.30000	2.83000	0.43200
	2012	1.3129343	90.08306	2.46994	31.60000	7.52000	2.83000	0.43300
	2013	1.516276	92.44621	4.01514	31.60000	7.69000	2.83000	0.46000
	2014	1.6987695	94.94382	6.78844	31.60000	7.92000	2.83000	0.48000
Indonesia	2006	1.3479426	113.42058	1.65815	56.40000	6.57000	4.29000	0.32500
	2007	1.6030106	117.04067	2.33967	55.10000	6.62000	4.29000	0.37400
	2008	1.826329	125.94868	-3.85225	55.70000	6.41000	4.29000	0.37800
	2009	0.9039194	120.21151	5.74795	53.50000	6.34000	4.29000	0.35900
	2010	2.0251791	127.60423	-1.74610	63.50000	6.53000	4.90000	0.36100
	2011	2.3029843	134.50173	4.59438	63.20000	6.53000	4.90000	0.37100
	2012	2.3097803	129.52431	7.75019	60.67000	6.76000	4.90000	0.37500
	2013	2.5513563	122.56753	6.37493	60.30000	6.82000	4.90000	0.52000
	2014	2.8199726	121.78116	6.84894	61.39000	6.95000	4.90000	0.52000
Japan	2006	-0.0529075	88.92753	2.57090	59.22000	8.12000	5.87000	0.79300
	2007	0.4790684	83.47662	2.63203	60.50000	8.11000	5.87000	0.75300
	2008	0.488791	75.27676	2.91909	57.70000	8.15000	5.87000	0.76300
	2009	0.233714	89.99107	2.34820	60.10000	8.25000	5.87000	0.76700
	2010	0.1305412	87.11726	3.56153	58.60000	8.08000	5.90000	0.79000
	2011	-0.013816	80.62346	3.22927	58.80000	8.08000	5.90000	0.78600
	2012	0.0088174	81.22486	2.18564	59.18000	8.08000	5.90000	0.79400
	2013	0.2065366	78.75072	1.64262	58.86000	8.08000	5.90000	0.81000
	2014	0.4073693	77.98981	-0.52137	58.95000	8.08000	5.90000	0.78000
Korea, Rep	2006	0.9055073	61.98996	6.13590	25.20000	8.04000	5.60000	0.61000
	2007	0.7862353	58.05541	4.05719	24.50000	8.04000	5.60000	0.65400
	2008	1.1162729	51.78110	4.09071	23.80000	7.88000	5.60000	0.62300
	2009	1.0002828	53.98342	2.03480	23.60000	8.01000	5.60000	0.64600
	2010	0.8677392	50.02973	2.27820	23.97000	8.11000	5.73000	0.63900
	2011	0.812748	44.94681	4.10781	23.79000	8.06000	5.73000	0.64800
	2012	0.7765655	44.19278	4.30738	23.79000	8.13000	5.73000	0.64300
	2013	0.9778302	45.65728	3.75794	23.85000	8.06000	5.73000	0.73000
	2014	0.6570805	46.41906	3.64103	23.81000	8.06000	5.73000	0.77000

Country	Year	FDI	TOT	RIR	PELF	DMI	PEE	ROL
Malaysia	2006	4.7272024	101.86707	2.40917	21.25000	6.27000	5.03000	0.60300
	2007	4.686888	101.96326	4.44291	19.30000	6.30000	5.03000	0.57800
	2008	3.2807913	109.18756	-5.28943	18.30000	5.98000	5.03000	0.54100
	2009	0.0566923	95.80260	10.63331	17.40000	6.36000	5.03000	0.54600
	2010	4.2685903	97.58774	-2.51777	16.50000	6.19000	5.22000	0.56600
	2011	5.0744325	97.67727	-0.47198	16.90000	6.19000	5.22000	0.55700
	2012	2.8290594	97.02297	3.74944	16.80000	6.41000	5.22000	0.58100
	2013	3.494305	96.63096	4.42949	33.30000	6.49000	5.22000	0.60000
	2014	3.1412026	96.23330	2.07142	31.50000	6.49000	5.22000	0.58000
Nepal	2006	-0.0735094	83.23272	0.59609	53.70000	4.16000	1.66000	0.34400
	2007	0.0556064	80.87116	0.36868	53.70000	4.24000	1.66000	0.36400
	2008	0.0079322	72.79182	2.25350	53.70000	3.42000	1.66000	0.35600
	2009	0.2977154	77.46258	-6.82292	53.70000	4.05000	1.66000	0.34500
	2010	0.5482947	74.03443	-6.20679	53.70000	4.24000	2.06000	0.33400
	2011	0.4971147	72.68919	7.00000	53.70000	4.24000	2.06000	0.33100
	2012	0.4880065	72.88508	7.00000	53.70000	4.16000	2.06000	0.33800
	2013	0.3852646	74.77828	7.00000	53.70000	4.77000	2.06000	0.50000
	2014	0.1519938	77.23401	7.00000	53.70000	4.77000	2.06000	0.50000
Pakistan	2006	3.112978	70.01456	-6.90000	18.80000	4.45000	2.37000	0.30900
	2007	3.6683228	65.53908	4.20000	16.00000	4.47000	2.37000	0.33800
	2008	3.19736	57.62594	-0.20000	15.60000	3.92000	2.37000	0.32200
	2009	1.3904023	64.83013	-5.10000	16.80000	4.46000	2.37000	0.31100
	2010	1.139753	64.68504	4.90000	16.13000	4.55000	2.31000	0.31900
	2011	0.6208231	61.78676	-4.20000	16.18000	4.55000	2.31000	0.30400
	2012	0.3828265	59.33761	7.10000	16.37000	4.57000	2.31000	0.30300
	2013	0.5765108	56.66978	4.20000	16.23000	4.64000	2.31000	0.33700
	2014	0.7640339	58.80351	4.50000	16.26000	4.64000	2.31000	0.33600
Russia	2006	3.797718	157.46658	-4.12004	7.40000	4.15000	5.24000	0.31800
	2007	4.2989501	164.69795	-3.31362	6.40000	4.06000	5.24000	0.31000
	2008	4.5027041	198.07869	-4.86151	5.60000	5.02000	5.24000	0.30200
	2009	2.9921309	131.98550	13.05426	5.50000	4.48000	5.24000	0.31400
	2010	2.8308298	159.75826	-2.95158	4.90000	4.26000	5.33000	0.31700
	2011	2.7111174	194.60928	-8.58837	4.70000	3.92000	5.33000	0.32300
	2012	2.3310697	203.20969	0.73967	4.40000	3.74000	5.33000	0.31600
	2013	3.1031164	189.72846	4.48238	4.10000	3.59000	5.33000	0.43000
	2014	1.0675836	182.19342	0.38744	4.40000	3.39000	5.33000	0.45000

Country	Year	FDI	TOT	RIR	PELF	DMI	PEE	ROL
Singapore	2006	24.982805	82.25726	3.53177	28.30000	5.90000	4.88000	0.94500
	2007	26.521207	80.75323	-0.50160	27.70000	5.91000	4.88000	0.88900
	2008	6.3470669	79.37778	6.97566	24.20000	5.89000	4.88000	0.89000
	2009	12.380546	79.03601	1.79575	24.30000	5.89000	4.88000	0.88600
	2010	23.295596	79.52157	5.42848	22.20000	5.89000	4.92000	0.89000
	2011	17.83602	77.65522	4.22277	21.50000	5.89000	4.92000	0.88500
	2012	19.448138	77.05444	4.61596	20.70000	5.88000	4.92000	0.89300
	2013	21.382574	77.10596	6.12314	19.80000	5.92000	4.92000	0.80000
	2014	24.010514	77.51777	5.30428	20.68000	6.03000	4.92000	0.79000
Sri Lanka	2006	1.6962629	107.83874	3.11203	67.60000	6.23000	6.15000	0.46900
	2007	1.8639733	107.71236	2.60598	67.50000	6.22000	6.15000	0.50500
	2008	1.8475303	95.74289	2.44396	67.10000	6.58000	6.15000	0.48100
	2009	0.9603906	111.98002	4.94912	63.80000	6.61000	6.15000	0.45600
	2010	0.8418735	109.89625	-8.58837	63.90000	6.64000	6.08000	0.45300
	2011	1.4640525	99.79718	6.41051	47.60000	6.58000	6.08000	0.45600
	2012	1.3752098	98.45755	3.12336	46.80000	5.75000	6.08000	0.46500
	2013	1.2548154	103.05514	3.50447	49.20000	5.69000	6.08000	0.55000
	2014	1.1260949	107.34257	2.39673	47.86667	5.69000	6.08000	0.52000
Thailand	2006	4.0212532	95.59744	2.14063	38.61000	6.37000	4.43000	0.47400
	2007	3.283569	95.91484	4.46621	39.03000	6.25000	4.43000	0.45500
	2008	2.9382481	94.05258	1.81473	38.10000	5.67000	4.43000	0.44500
	2009	2.2759066	96.85702	5.75672	38.00000	6.81000	4.43000	0.45000
	2010	4.3232062	97.79548	1.78007	38.60000	6.55000	4.97000	0.44900
	2011	0.6670876	93.80528	3.05383	38.70000	6.55000	4.97000	0.45000
	2012	3.2445508	92.89878	5.09061	39.20000	6.55000	4.97000	0.44900
	2013	3.7895057	94.45544	5.14451	41.60000	6.25000	4.97000	0.53000
	2014	1.2239094	95.23809	5.75333	39.83000	5.39000	4.97000	0.52000
UAE	2006	5.7654375	148.04047	0.00000	29.30000	2.54000	4.90000	0.69600
	2007	5.5004397	150.34097	0.00000	29.30000	2.55000	4.90000	0.64400
	2008	1.6048746	173.33911	0.00000	29.30000	2.42000	4.90000	0.66200
	2009	0.4473674	146.78311	0.00000	29.30000	2.60000	4.90000	0.64200
	2010	3.03462	162.76259	0.00000	29.30000	2.52000	4.97000	0.62900
	2011	2.0381661	181.46350	0.00000	29.30000	2.58000	4.97000	0.66000
	2012	2.355376	209.30403	0.00000	29.30000	2.58000	4.97000	0.67400
	2013	2.4309239	200.93772	0.00000	29.30000	2.52000	4.97000	0.64000
	2014	2.6810856	215.87661	0.00000	29.30000	2.64000	4.97000	0.65000

Country	Year	FDI	TOT	RIR	PELF	DMI	PEE	ROL
UK	2006	7.6032602	104.35546	1.64362	9.90000	8.18000	5.73000	0.88800
	2007	6.8401764	103.78009	2.88683	9.80000	8.20000	5.73000	0.84000
	2008	8.8143752	104.19058	1.80029	9.20000	8.08000	5.73000	0.83200
	2009	0.6145469	102.66744	-0.87221	8.60000	8.15000	5.73000	0.83300
	2010	2.746639	102.78114	-1.02625	7.70000	8.16000	5.88000	0.83200
	2011	1.0354107	101.17666	-1.48164	7.50000	8.16000	5.88000	0.82300
	2012	1.7668459	100.84187	-1.02339	6.80000	8.21000	5.88000	0.83300
	2013	2.0030515	102.69042	-1.37807	6.70000	8.31000	5.88000	0.78000
	2014	2.3797317	100.80458	-1.12699	16.70000	8.31000	5.88000	0.78000
USA	2006	2.1239202	95.95429	4.73962	2.43000	8.16000	5.94000	0.80900
	2007	2.3488988	96.56174	5.24897	2.38000	8.15000	5.94000	0.79200
	2008	2.260639	91.81236	3.06575	2.30000	8.22000	5.94000	0.80200
	2009	1.0665843	98.95344	2.47179	2.70000	8.22000	5.94000	0.78400
	2010	1.7330764	97.10804	2.00417	2.60000	8.18000	5.95000	0.78900
	2011	1.6587913	94.61257	1.16139	2.40000	8.11000	5.95000	0.78700
	2012	1.5042226	94.26430	1.38248	2.20000	8.11000	5.95000	0.79800
	2013	1.6593938	94.88702	1.60901	2.10000	8.11000	5.95000	0.73000
	2014	1.1922369	93.87506	1.43398	1.80000	8.11000	5.95000	0.71000

Country	Year	PAG	AGRP	NRR	PCGDP
Afghanistan	2006	49.89000	3.16000	1.13000	280.25
	2007	50.00000	2.72000	0.82000	380.40
	2008	50.05000	2.49000	0.99000	384.13
	2009	50.02000	2.53000	0.59000	458.95
	2010	49.86000	2.74000	0.73000	569.94
	2011	49.41000	2.98000	0.77000	622.38
	2012	48.80000	3.14000	0.69000	690.84
	2013	48.08000	3.16000	0.74000	653.35
	2014	47.31000	3.03000	0.73000	633.95
Australia	2006	32.54918	1.47523	6.41553	36083.80
	2007	32.43724	0.62468	8.23079	40957.90
	2008	32.39246	2.00402	10.26265	49627.50
	2009	32.41841	2.06105	6.48028	42714.80
	2010	32.50340	1.55549	9.58182	51844.30
	2011	32.71533	1.38953	10.56036	62218.00
	2012	32.92649	1.72290	7.77285	67649.80
	2013	33.16145	1.69747	8.29259	67649.80
	2014	33.43589	1.47429	7.31075	62006.80
Bangladesh	2006	38.38237	1.32696	1.68657	495.85
	2007	38.01364	1.20335	1.58452	543.08
	2008	37.62465	1.12588	1.62001	618.08
	2009	37.22365	1.10906	1.10088	683.61
	2010	36.81391	1.13488	1.20867	760.34
	2011	36.33031	1.17293	1.52576	838.55
	2012	35.86885	1.19988	1.46504	858.93
	2013	35.41179	1.21635	1.10629	954.40
	2014	34.93222	1.21438	1.06669	1086.80
China	2006	27.03389	0.55837	5.56168	2099.24
	2007	26.51370	0.52227	6.30981	2695.37
	2008	26.08243	0.51239	9.84506	3471.25
	2009	25.79202	0.49738	3.74655	3838.44
	2010	25.66093	0.48296	6.25453	4560.51
	2011	25.64686	0.47915	7.80791	5633.80
	2012	25.78149	0.48723	4.97881	6337.88
	2013	26.04359	0.49371	4.07022	7077.74
	2014	26.38751	0.50631	2.90739	7683.50

Country	Year	PAG	AGRP	NRR	PCGDP
India	2006	37.28158	1.54026	4.18854	816.73
	2007	36.98620	1.50293	4.87599	1018.13
	2008	36.67791	1.46290	7.52119	991.51
	2009	36.35228	1.41938	3.58170	1090.36
	2010	36.00759	1.37435	4.65324	1345.73
	2011	35.70483	1.32840	5.20045	1461.37
	2012	35.37299	1.28583	4.03752	1446.77
	2013	35.02953	1.25119	3.68505	1451.54
	2014	34.70110	1.22673	2.75157	1569.94
Indonesia	2006	34.40666	1.32127	9.38190	1590.18
	2007	34.17320	1.31419	9.85951	1860.63
	2008	34.00205	1.31035	11.20000	2167.85
	2009	33.89131	1.31037	6.18785	2262.71
	2010	33.81933	1.31146	6.79062	3125.22
	2011	33.58282	1.31375	8.47436	3647.62
	2012	33.41511	1.31061	6.49338	3700.53
	2013	33.26930	1.29398	5.68559	3631.68
	2014	33.09139	1.26019	4.46267	3499.59
Japan	2006	27.78693	0.06337	0.01600	35433.00
	2007	27.84022	0.11491	0.01854	35273.90
	2008	27.78321	0.04843	0.02014	39340.10
	2009	27.59443	-0.01249	0.01829	40855.60
	2010	27.32896	0.01796	0.01786	44506.90
	2011	27.22503	-0.19753	0.02069	48175.20
	2012	27.08455	-0.20032	0.02088	48630.20
	2013	26.98377	-0.17487	0.02244	40489.60
	2014	26.98899	-0.16255	0.02159	38139.30
Korea, Rep	2006	34.72216	0.48465	0.02037	20917.10
	2007	34.07334	0.46552	0.02431	23102.60
	2008	33.43744	0.71976	0.04348	20474.80
	2009	32.85829	0.47557	0.03567	18338.70
	2010	32.34576	0.46318	0.03184	22150.20
	2011	31.94171	0.74418	0.03465	24156.30
	2012	31.65978	0.45098	0.03009	24455.20
	2013	31.22193	0.42949	0.02936	25998.70
	2014	31.04451	0.40596	0.02516	27989.90

Country	Year	PAG	AGRP	NRR	PCGDP
Malaysia	2006	36.91870	1.79387	12.35230	6194.64
	2007	35.91937	1.76463	11.46158	7240.68
	2008	35.01804	1.73128	12.38554	8486.57
	2009	34.24076	1.69020	8.55597	7311.98
	2010	33.60054	1.64392	8.44977	9069.02
	2011	33.12553	1.59979	9.12792	10427.80
	2012	32.75477	1.55909	8.74376	10834.70
	2013	32.49086	1.51636	7.89928	10971.40
	2014	32.30782	1.47095	7.28909	11305.90
Nepal	2006	43.78000	1.12000	1.08000	350.61
	2007	43.39000	1.04000	1.36000	396.17
	2008	43.01000	1.00000	1.07000	476.56
	2009	42.60000	1.01000	1.00000	483.40
	2010	42.14000	1.06000	1.47000	595.43
	2011	41.38000	1.12000	1.28000	693.55
	2012	40.55000	1.18000	1.09000	698.41
	2013	39.70000	1.21000	0.95000	696.73
	2014	38.90000	1.21000	0.98000	703.19
Pakistan	2006	41.94905	2.04460	3.01137	876.95
	2007	41.56717	2.05101	2.78084	953.80
	2008	41.25135	2.06243	2.97239	1042.81
	2009	40.93835	2.07763	1.79640	1009.80
	2010	40.60382	2.09354	2.15983	1043.30
	2011	40.41899	2.10982	2.61216	1229.85
	2012	40.17343	2.12085	2.53916	1264.90
	2013	39.90926	2.11974	2.17735	1276.10
	2014	39.67986	2.10344	1.91721	1320.56
Russia	2006	28.73016	-0.32732	19.42074	6920.20
	2007	28.39950	-0.17102	16.31066	9101.28
	2008	28.10548	-0.04394	18.07004	11635.30
	2009	27.95155	0.03011	14.15160	8562.78
	2010	27.97794	0.04489	13.90126	10675.00
	2011	28.18490	0.07797	16.14764	14212.10
	2012	28.56405	0.16830	15.56274	15154.50
	2013	29.05379	0.21292	13.73401	15543.70
	2014	29.58187	0.21770	13.47240	14126.00

Country	Year	PAG	AGRP	NRR	PCGDP
Singapore	2006	27.30070	3.12939	0.00033	33580.50
	2007	27.18849	4.16600	0.00040	39222.30
	2008	26.96379	5.32152	0.00063	39719.60
	2009	26.65559	3.01595	0.00058	38576.60
	2010	26.35346	1.77183	0.00046	46569.40
	2011	26.36993	2.08490	0.00052	53093.00
	2012	26.48657	2.45339	0.00043	54453.40
	2013	26.68256	1.61931	0.00036	55620.10
	2014	26.93217	1.29844	0.00049	56005.20
Sri Lanka	2006	32.51588	0.75592	0.16128	1448.76
	2007	32.56599	0.75534	0.19470	1644.81
	2008	32.60550	0.75472	0.17181	2054.48
	2009	32.66386	0.75908	0.13814	2106.68
	2010	32.75561	0.75337	0.18067	2819.51
	2011	32.97773	0.75267	0.16291	3220.98
	2012	33.22528	0.75683	0.13603	3350.52
	2013	33.47418	0.78030	0.10964	3610.28
	2014	33.69574	0.89951	0.10269	3852.74
Thailand	2006	29.42313	0.47034	2.51429	3351.12
	2007	29.01857	0.27026	2.45915	3962.74
	2008	28.64900	0.15012	3.35188	4384.80
	2009	28.33206	0.14277	2.11873	4231.15
	2010	28.09416	0.21589	2.31298	5111.92
	2011	28.00258	0.31578	2.86646	5539.50
	2012	27.96163	0.38961	2.80484	5915.20
	2013	27.97812	0.42683	2.42512	6225.07
	2014	28.05337	0.40622	2.28021	5969.93
UAE	2006	17.67331	14.30514	24.21290	42950.30
	2007	16.39761	15.03260	22.05718	42916.00
	2008	15.39935	13.81006	25.15527	45720.40
	2009	14.64543	11.03824	16.79299	32905.70
	2010	14.03698	7.78734	20.83524	34341.20
	2011	14.24657	4.75083	25.85534	39902.70
	2012	14.45033	2.46314	26.17097	41710.20
	2013	14.65995	0.97192	25.33986	42984.70
	2014	14.87308	0.50933	22.48196	44236.30

Country	Year	PAG	AGRP	NRR	PCGDP
UK	2006	33.90103	0.73505	0.96616	44015.60
	2007	33.85007	0.77867	0.86739	49951.10
	2008	33.82653	0.78703	1.23965	46522.90
	2009	33.82940	0.75639	0.83363	38009.80
	2010	33.87051	0.78389	0.88036	38707.90
	2011	34.20680	0.78168	1.07205	41241.50
	2012	34.53205	0.69532	0.92784	41539.50
	2013	34.86182	0.66953	0.76035	42408.30
	2014	35.20094	0.75335	0.61396	46411.40
USA	2006	32.75828	0.96425	1.28468	46434.60
	2007	32.72744	0.95106	1.21417	48059.70
	2008	32.69166	0.94587	2.10225	48402.20
	2009	32.69828	0.87665	0.80599	46999.90
	2010	32.76588	0.83599	0.98231	48373.10
	2011	32.84634	0.76385	1.21718	49781.60
	2012	32.98154	0.76181	0.87488	51431.20
	2013	33.18690	0.73741	0.84290	52749.00
	2014	33.44709	0.78070	0.80804	54540.60

APPENDIX - B Results of the Correlation Coefficient among Variables

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. pwcorr pcdmb cbb broa blad rgdpg rir to fdi ngvi, star(0.05) sig
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	pcdmb	cbb	broa	blad	rgdpg	rir	to
pcdmb	1.0000						
cbb	0.3316*	1.0000					
	0.0000						
broa	-0.2034*	-0.1185	1.0000				
	0.0094	0.1330					
blad	-0.0815	-0.0079	0.0582	1.0000			
	0.3026	0.9210	0.4621				
rgdpg	-0.2898*	-0.4915*	0.2041*	0.0253	1.0000		
	0.0002	0.0000	0.0092	0.7495			
rir	-0.1151	-0.1740*	-0.0052	0.0078	-0.0438	1.0000	
	0.1445	0.0268	0.9475	0.9218	0.5803		
to	0.2424*	-0.2560*	0.1449	0.0699	0.0840	0.0398	1.0000
	0.0019	0.0010	0.0658	0.3768	0.2881	0.6147	
fdi	0.2588*	-0.0731	0.1144	0.1304	0.1894*	-0.0023	0.8036*
	0.0009	0.3555	0.1470	0.0982	0.0158	0.9767	0.0000
ngvi	0.5952*	0.5440*	-0.0161	-0.0719	-0.3364*	-0.1341	0.3068*
	0.0000	0.0000	0.8390	0.3630	0.0000	0.0888	0.0001

	fdi	ngvi
fdi	1.0000	
ngvi	0.4232*	1.0000
	0.0000	

```
. pwcorr  rgdpg pcdmb cbb broa blad pi tc hc ngvi, star(0.05) sig
```

	rgdpg	pcdmb	cbb	broa	blad	pi	tc
rgdpg	1.0000						
pcdmb	-0.2898*	1.0000					
	0.0002						
cbb	-0.4915*	0.3316*	1.0000				
	0.0000	0.0000					
broa	0.2041*	-0.2034*	-0.1185	1.0000			
	0.0092	0.0094	0.1330				
blad	0.0253	-0.0815	-0.0079	0.0582	1.0000		
	0.7495	0.3026	0.9210	0.4621			
pi	0.3510*	0.1745*	-0.1986*	0.1515	-0.4034*	1.0000	
	0.0000	0.0263	0.0113	0.0543	0.0000		
tc	0.0435	0.2608*	-0.1412	-0.3103*	-0.4765*	0.2657*	1.0000
	0.5823	0.0008	0.0731	0.0001	0.0000	0.0006	
hc	-0.4347*	0.4765*	0.8582*	-0.1333	0.0101	-0.1940*	-0.0867
	0.0000	0.0000	0.0000	0.0909	0.8984	0.0134	0.2727
ngvi	-0.3364*	0.5952*	0.5440*	-0.0161	-0.0719	-0.1005	-0.0512
	0.0000	0.0000	0.0000	0.8390	0.3630	0.2034	0.5172

	hc	ngvi
hc	1.0000	
ngvi	0.6005*	1.0000
	0.0000	

.

```
. pwcorr  rgdpg gce lnpgdp ifr to fdi agrp nrr, star(0.05) sig
```

	rgdpg	gce	lnpgdp	ifr	to	fdi	agrp
rgdpg	1.0000						
gce	-0.1334 0.0905	1.0000					
lnpgdp	-0.4141* 0.0000	-0.4468* 0.0000	1.0000				
ifr	0.1797* 0.0221	0.2990* 0.0001	-0.6018* 0.0000	1.0000			
to	0.0840 0.2881	-0.5187* 0.0000	0.3202* 0.0000	-0.2207* 0.0048	1.0000		
fdi	0.1894* 0.0158	-0.4697* 0.0000	0.3416* 0.0000	-0.1681* 0.0325	0.8036* 0.0000	1.0000	
agrp	0.0208 0.7928	-0.0119 0.8801	0.0792 0.3164	0.1744* 0.0264	0.2810* 0.0003	0.1421 0.0712	1.0000
nrr	0.0195 0.8058	-0.3606* 0.0000	0.2238* 0.0042	0.0835 0.2909	0.0749 0.3436	-0.0232 0.7695	0.4404* 0.0000

	nrr
nrr	1.0000

```
.
```

```
. pwcorr pi lnpgdp gce to ifr rol dmi fdi, star(0.05) sig
```

	pi	lnpgdp	gce	to	ifr	rol	dmi
pi	1.0000						
lnpgdp	-0.0399 0.6145	1.0000					
gce	-0.6053* 0.0000	-0.4468* 0.0000	1.0000				
to	0.0440 0.5785	0.3202* 0.0000	-0.5187* 0.0000	1.0000			
ifr	-0.1335 0.0903	-0.6018* 0.0000	0.2990* 0.0001	-0.2207* 0.0048	1.0000		
rol	-0.0180 0.8205	0.8824* 0.0000	-0.3806* 0.0000	0.3605* 0.0000	-0.5779* 0.0000	1.0000	
dmi	0.0235 0.7662	0.4535* 0.0000	-0.1000 0.2057	-0.1088 0.1682	-0.3294* 0.0000	0.6316* 0.0000	1.0000
fdi	0.0766 0.3329	0.3416* 0.0000	-0.4697* 0.0000	0.8036* 0.0000	-0.1681* 0.0325	0.3998* 0.0000	0.0061 0.9386

	fdi
fdi	1.0000

```
.
```

```
. pwcorr hc tc lnpgdp gce to pag rol, star(0.05) sig
```

	hc	tc	lnpgdp	gce	to	pag	rol
hc	1.0000						
tc	-0.0867 0.2727	1.0000					
lnpgdp	0.8622* 0.0000	-0.1146 0.1466	1.0000				
gce	-0.2278* 0.0036	-0.1683* 0.0323	-0.4468* 0.0000	1.0000			
to	0.0826 0.2958	0.0029 0.9704	0.3202* 0.0000	-0.5187* 0.0000	1.0000		
pag	-0.4053* 0.0000	0.0870 0.2708	-0.6701* 0.0000	0.7557* 0.0000	-0.3687* 0.0000	1.0000	
rol	0.7365* 0.0000	0.0788 0.3189	0.8824* 0.0000	-0.3806* 0.0000	0.3605* 0.0000	-0.4935* 0.0000	1.0000

```
.
. pwcorr tc hc lnpgdp pelf to gce rir adfr rol ifr tot, star(0.05) sig
```

	tc	hc	lnpgdp	pelf	to	gce	rir
tc	1.0000						
hc	-0.0867 0.2727	1.0000					
lnpgdp	-0.1146 0.1466	0.8622* 0.0000	1.0000				
pelf	0.1959* 0.0125	-0.3408* 0.0000	-0.1947* 0.0130	1.0000			
to	0.0029 0.9704	0.0826 0.2958	0.3202* 0.0000	-0.0774 0.3279	1.0000		
gce	-0.1683* 0.0323	-0.2278* 0.0036	-0.4468* 0.0000	-0.1623* 0.0391	-0.5187* 0.0000	1.0000	
rir	0.0456 0.5648	-0.1945* 0.0131	-0.1786* 0.0230	0.0001 0.9989	0.0398 0.6147	0.1680* 0.0326	1.0000
adfr	-0.1732* 0.0276	-0.6552* 0.0000	-0.7555* 0.0000	-0.0291 0.7134	-0.2946* 0.0001	0.6646* 0.0000	0.2209* 0.0047
rol	0.0788 0.3189	0.7365* 0.0000	0.8824* 0.0000	-0.0355 0.6536	0.3605* 0.0000	-0.3806* 0.0000	-0.0696 0.3790
ifr	-0.1442 0.0671	-0.4138* 0.0000	-0.6018* 0.0000	0.0467 0.5552	-0.2207* 0.0048	0.2990* 0.0001	-0.1095 0.1654
tot	-0.9010* 0.0000	0.2002* 0.0106	0.2639* 0.0007	-0.1393 0.0771	-0.0423 0.5926	0.0038 0.9618	-0.1312 0.0960

	adfr	rol	ifr	tot
adfr	1.0000			
rol	-0.6773* 0.0000	1.0000		
ifr	0.4380* 0.0000	-0.5779* 0.0000	1.0000	
tot	0.0003 0.9967	0.0383 0.6282	-0.0240 0.7616	1.0000

```
.
```

```
. pwcorr ngvi lnpgdp gce pee, star(0.05) sig

             |     ngvi   lnpgdp      gce      pee
-------------+------------------------------------
        ngvi |   1.0000
             |
             |
      lnpgdp |   0.7647*  1.0000
             |   0.0000
             |
         gce |  -0.3233* -0.4468*  1.0000
             |   0.0000   0.0000
             |
         pee |   0.5876*  0.8347* -0.4628*  1.0000
             |   0.0000   0.0000   0.0000
             |

.
```