# Role of Financial Sector Development in Trade Openness and Economic Growth: A Case Study of SAARC Countries


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# ***Dedication***

To "*My Parents*"

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# List of Abbreviations

| | |
|---|---|
| **OECD** | Organisation For Economic Co-Operation And Development |
| **GDP** | Gross Domestic Product |
| **SAARC** | South Asian Association Of Regional Cooperation |
| **ASEAN** | Association Of Southeast Asian Nations |
| **OIC** | Organization Of Islamic Conference. |
| **RIAs** | Regional Integration Agreements |
| **SAPTA** | South Asian Preferential Trade Agreement |
| **SAFTA** | The South Asian Free Trade Area |
| **FDI** | Foreign Direct Investment |
| **GMM** | Generalized Method Of Moments |
| **PCA** | Principal Component Analysis |
| **DOLS** | Dynamic Ordinary Least Square |
| **FMOLS** | Fully Modified Ordinary Least Square |
| **WDI** | World Development Indicators |

## ABSTRACT

The study is an attempt to investigate the role of financial sector in the growth effectiveness of trade openness. The empirical analysis estimates different growth equations by utilizing a panel data approach for a set of SAARC countries spanning from 1980-2014. Considering the nature of data set the empirical estimations have been carried out through Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) estimations techniques. The findings of the study reveal that both financial sector and trade openness contributes positively to economic growth in selected SAARC countries. Our results show that trade openness and financial development are complementary and a developed financial system increases the effect of trade openness. So, we can conclude that both trade openness and financial development help to increase the economic growth of the selected SAARC countries. Findings of the study suggest that SAARC countries should increase growth effectiveness of trade openness in the presence of financial sector development.



Keywords: Trade Openness; Financial Development; Economic Growth; Panel Data Analysis; SAARC

# Chapter 1

# Introduction

## 1.1 Background

Trade openness increases the usage and output of resources in order to reach a country's prosperity goal in the areas of business, investment and banking. The world in 20th century went through a standard change in economic status by initiating globalization as a result world economic and financial linkages become stronger across global economies.

Along with trade liberalization process limitations on cross border financial dealings linked to the capital account, have gradually dropped by the governments since the termination of the Bretton Woods systems. But countries other than OECD little is thought about the choice of whether and when to leave such limitations, in spite of the way that a great part of the fundamental liberalization in the developing countries reached in 1990s (Guisinger & Brune, 2014).

In economic literature the link between trade openness and economic growth has long been a matter of attraction for discussion. International trade makes efficient allocation of economic resource, which turns in efficient production and prices mechanism. Integration of the economy into the global system and the import of modern technology also encourage by an open trade regime. Generally, a country openness rate is computed as the percentage of foreign trade volume to GDP along with the usage of the percentage of import to GDP and the percentage of export rise. Similarly, trade openness also shows the reliance of a country on the foreign trade

and the intensity of rate of openness shows the significance of the foreign trade for a country economy. As the volume of foreign trade increases the share of foreign trade in GDP will increase.

Openness is thought to influence economic growth through number of channels. First, a liberal trade regime with greater competition and better resource allocation improves the efficiency. Second, better approach to world markets permits the economies to reduce size limits and take advantage from economies of scale. Third, intermediate and capital goods imports can support the process of growth, by increasing the productive ability of the economy. Fourth, trade can start production improvements through global diffusion and by adopting new technologies.

Trade openness is always supposed as significant source of economic growth and contributes in economic growth through several ways. It generates enormous advantages, as due to the broaden markets and economies of scale increase investments, stream of data, technology and knowledge spill overs. As it makes the utilization of resources more productive; boost the technological capabilities and trade helps to develop the less developed areas of economy by utilizing the returns from higher foreign exchange (Bajwa & Siddiqi, 2011).

Various studies document that mostly in developed countries trade openness play active role. For instance Dowrick and Golley (2004) investigated the link between growth and foreign trade to check that whether the benefits from trade across the countries and over the time may change. According to their findings since 1980 mostly developed economies taking benefits from trade and less developed countries harvest the benefits but less than their greater counter parts.

The received economic literature reached the concern that, with numerous other substantial factors, a country welfare, performance and economic growth connected to the degree of

financial development. A country financial development depends on its size, access, depth and also the strength and capability of a financial system which take into account its markets, assets range, intermediaries, institutions, and regulations (The Financial Development Report, 2012). Financial development is a process that expands and strengthens the financial services of banks and other financial organizations. With the developments in technology the role of financial intermediaries now become more significant than previously. Since an efficient and strong financial system is mandatory for a state, so every government needs a well- established and refined financial sector. Financial system facilitates rapid transfer of money from one place to other; strengthen real sector growth which is the result of competitive products offered by the financial system so that the flow of capital increases within the economy. Thus a more efficient and powerful financial system offers competent services that help to boost GDP per capita income.

An efficient financial system in a modern economy plays a vital role to facilitate the economic transaction, set up investor-friendly institution and competitive markets. An established and dynamic financial system reduces the insecurity, cost of transaction and by efficient allocation of resources makes the overall economic efficiency better. Empirical studies which analyse the relationship between financial sector development and economic growth can be separated into two groups. One group of this literature studied the influence of stock market developments, specifically, turnover ratio, market capitalization, and stocks exchanged on economic growth. Second group target the relationship of banking sector developments, specifically, private credit and liquid liabilities, and economic growth. The primary message of this literature study is the strong support for the hypothesis related to the financial and banking sector developments which promotes economic growth.

In literature, the relationship between financial development and economic growth has been broadly treated. This theoretical framework base can be traced from the initial discussions of Bagehot (1873) who argued that mobilization of capital and growth mainly depends on financial system performance. Schumpeter (1912) extended this idea and argued that for growth sustainability, important drivers are the services of financial institutions, and a well-developed financial system is the path way to use the financial resource to the most productive level. Thus, indicating that finance leads economic growth. The hypothesis recognized as the finance-led hypothesis and empirically proofed by McKinnon (1973), Shaw (1973) and Pagano (1993) among others. Another hypothesis the demand-lead hypothesis developed by the (Robinson, 1952) and argued that finance does not apply a causal effect on economic growth. He said that, economic growth followed by the financial development is due to higher demand for financial services. As per this view it is said that with the developments in economy, in response the demand for financial services increased, this emerged the more financial organizations, financial services and products in the market. Later on Patrick, (1966) extended the idea and argued that at the initial stages of development an economy consider the supply-leading finance, but as the economy develops the demand–leading finance dominates.

In economic literature the relationship between trade liberalization[1], financial reforms and economic growth has been well-documented. A considerable body of literature proposes a strong and positive link between trade liberalization, financial development and economic growth. It is widely believed that liberalize trade and financial policies decrease the inefficiency in the production process which in turn affect the economic growth positively. The countries having more open trade and financial policies as compare to the countries those have restricted trade and

[1] In this study we'll use Trade Liberalization and Trade Openness interchangeably.

financial policies grow faster. An increasing openness is expected to have positive impacts on economic growth (Jin, 2000; Fry, 1997) however; there is growing consensus among the economists about trade liberalization and its positive impacts on economic growth. Many developing countries have taken steps towards financial and trade liberalization to achieve higher level of growth.

The South Asian economies during their early phases of development followed the protectionist trade policies. The safety of the domestic industries from foreign rivalry and for the maintenance of foreign exchange to support the balance of payment, were the major principles of these trade policies.

As in 1980s regionalism and globalization achieve its strength, as a result East Asian countries harvested the gain from open trade. The South Asian countries under the banner of South Asian Association of Regional Cooperation (SAARC) also made effort to match the flow.

In following of a developed nation, developing nations with the objectives to enhance the financial and real sector performance join their hands together to establish regional associations. A number of economic associations & regions like SAARC, ASEAN, OIC, etc. were established with one of the objectives of economic growth and development. Following the successful practices of regional associations, SAARC was established on December 08, 1985. Bangladesh, Bhutan, India, Pakistan, Nepal, Sri Lanka, and Maldives were the founders of the organization. In April 2007 Afghanistan later on joined the regional association. To spur the economic and social development was the main objective of the SAARC region and to make quality of life better, self-reliance and economic assistance were the other objectives.

The countries forming the regional cooperation, SAARC, are very different in their size, population, economy, natural resources, as well as several other different attributes. India is the largest nation in all regards and Pakistan in terms of size is the second largest country. India covers over 70 per cent area of the region except Afghanistan its territorial and maritime boundary touches all SAARC countries. While Pakistan shares its boundary with Afghanistan. Bhutan and Nepal are land locked countries while Maldives and Sri Lanka are island countries.

Generally countries share a fair degree of interdependence in establishing an economic or political regional integration, However, SAARC countries regardless of establishing a regional cooperation, have some tension amongst them- varying from territorial dispute to water sharing to certain more significant issues like ethnic or religious issues.

All SAARC countries have economic problems like unemployment, poverty, income inequality, regional imbalances and depend upon external assistance/aid. These countries might be named as underdeveloped or developing economies. Except Afghanistan, Most of these countries, within the limits imposed by their social and political systems are moving towards economic growth.

To integrate with international economies, intra-regional trade development is one of the adequate ways as competition increases in countries both in forms of input use and cost effective production of output. It just not only arranges a broad market and engagement of production capabilities, it also helps to promote the transfer of technology , fuller employment of human capital and entrepreneurial capabilities in order to bring the economies of scale.

South Asian countries gradually recognized the importance of regional approaches and mutual actions in order to achieve their development goals. There are many benefits from following the regional cooperation, as it is a process through which a country economic system turns out to be more interconnected regionally, promote economic growth, decrease poverty and increase

country's level of employment. Regional trade integration provides assistance to decrease the growth gaps between developing countries and increase the growth of slow economies. Regional integration suggests expanding the national markets and productions for future and improving the intra-regional investment and trade in services. (Details regarding SAARC countries trade openness, financial development and economic growth are given in chapter 3).

## 1.2 Literature Gap

In the context of SAARC countries, though literature is available on the relationship between finance-growth and trade-growth but on the joint relationship between trade openness, financial development and economic growth there is very limited literature available. These studies included only five countries in analysis, while our empirical investigations have been carried out for 7 selected SAARC countries covering the period from 1980 to 2014. Therefore, the objective of our study is to fill up this gap and increase the body of knowledge. In this background in our study we used multivariate model to explain the relationship between Trade openness, financial development and economic growth among SAARC countries. There is less literature available on role of financial development in trade openness in the substitutability and complementarities for economic growth.

## 1.3 Objectives of the Study

The study aims to extend literature in the following;

- To analyse the impact of trade openness on economic growth in SAARC countries
- To explore the role of financial sector development in trade openness and economic growth nexus in sample countries.

## 1.4 Significance of the Study

As per existing literature including some most recent studies, provide literature regarding financial development, trade openness and economic growth. The findings of the study will helpful for the policy makers of SAARC countries to adopt the suitable policies with respect to financial development, and trade openness to increase economic growth in SAARC countries. This study will helpful for the analysts of SAARC countries to determine which country has strong financial sector and what are the key factors in that country which makes the country's financial sector different when compared to other countries financial sector. This research will also provide beneficial information not only for managers as well as for policy makers so that they may be able to improve the financial measures. The study will also helpful for SAARC countries that, these countries should promote trade openness, as it is a chance to interact and integrate with the markets of different countries and also help domestic economy to adopt the international skills and technique.

## 1.5 Organization of the Study

This study is organized into six chapters; First chapter provides a brief introduction about the background and the objectives of the study. In chapter 2, relevant theoretical and empirical literature is presented. In chapter 3 an overview of SAARC economy is presented. Chapter 4 consist of methodology including theoretical framework, econometric model, data sources and construction of variables. Chapter 5 presents empirical findings and conclusive interpretation. The study concludes with chapter 6 which summarize the key findings and its associated policy suggestions.

# Chapter 2

# Literature Review

Trade openness and financial development play an important role in the process of economic growth. Many empirical studies examined the role of trade openness and financial development in the long run economic growth. We categorize this chapter into three parts. First part describes the studies related to trade openness and economic growth relationship, and second part reviews the studies of financial development and economic growth relationship. Third part reviews studies related to the joint impact of financial development and trade openness on economic growth.

## 2.1 Trade Openness and Economic Growth

Economies around the globe appear to share the status of performers and non-performers as regards to their capability to make available better life standers for their people. The primary reasons that have permitted a few nations to achieve the high levels of income and have retained others at lower levels have been discussed since Adam Smith published his important work on the growth of nations. For a long time, this discussion was centred on static level impacts. However, today it is even more familiar that continuous important additions to per capita GDP are the product for high living standards – or in other words sustaining substantial growth rates. Significant growth rates are frequently connected with countries which are accepting the current globalization and expanding openness to the international trade of goods and services as well as ideas and technologies.

For the development process of countries international trade plays very important role. From developed to under developed countries as a transmission belt the multinational trade serves for the transfer of benefits of industrialization and modern technology. Behind the procedure of multinational trade openness the proposal is that growth is positively influence by the trade openness and supported by (Romer, 1986; Lucas, 1988) among other in the new growth theories (Romer, 1992; Grossman & Helpman, 1991) and (Barro & Sala-i-Martin, 1995) have claimed that more opened countries to the world have better capacity to take in the developed countries created technological advances but (Levine & Renelt, 1992; Harrison, 1996; Rodriguez & Rodrik, 1999) supported the contrary of this view.

Eriş and Ulaşan (2013) examined the trade openness and economic growth relationship robustness over the time period of 1960-2000. They used Bayesian model averaging methods. The study found no evidence that in long run trade openness directly and robustly associated with economic growth. They further checked their findings by applying set of proxies for trade openness, namely, real openness, current openness, based on the (Sachs, Warner, Åslund, & Fischer, 1995) criteria the fraction of open years, black market premium, the weighted averages of tariff and non-tariff hurdles but none of these were robustly linked with economic growth. The data also indicated that economic institution and macroeconomic uncertainties persuaded by high inflation and government excess consumption were the important components in explaining the economic growth.

The market failures such as trade limitations and positive production in import competing sectors give some negative connection between trade openness and economic growth. In Barro and Lee (1994) study the results were not robust, initially a little negative relationship was estimated. The relationship was found insignificant between trade openness and economic growth when for

average tariff, import as a fraction of imports was used as a measure. Misati and Nyamongo (2012) used a bank crisis model and reported the dual role of openness on economic growth for the Sub-Saharan African countries. The findings of the study indicated growth impeding effects were superior over growth enhancing effects.

Edwards (1998) examined the robustness of the relationship between trade openness and total factor productivity growth and used comparative data for 93 countries. To check whether data supported the perspective that in more open countries the factor production growth was faster, he used nine indexes of trade policy. The outcomes were robust to the utilization of openness indicator, time period, methodology, and functional form and support the perspective that more open economies experienced faster growth.

Mercan, Gocer, Bulut, and Dam (2013) explored the impact of trade openness on economic growth for developing countries[2] through panel data for the period of 1989-2010.The external trade rate (export+import) to GDP was taken as indicator for trade openness. The empirical results of the study through panel data analysis found positive effect of openness on economic growth.

Das and Paul (2011) studied the impact of openness on economic growth, by considering the average growth rate of last two decades for the selected 12 top performed Asian countries[3] taking time period of 1971 to 2009. The results showed the positive effect of openness on economic growth and to beat the weakness of the endogeneity GMM techniques was used. Output growth has insignificant effect of growth in labour force and capital stock has significant effect on output growth respectively.

[2] Brazil, Russia, India, China and Turkey

[3] Bangladesh, China, India, Indonesia, Korea Republic, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, and Thailand

Ulasan (2012) reconsidered the empirical data on the link between trade openness and economic growth taking data from 1960 to 2000. He used several measures as proposed by the literature relatively depending on few proxies. He constructed three additional indexes of composite trade policy to evaluate the viewpoint of trade policy. The result showed that many variables of openness significantly and positively correlated with economic growth. But in some circumstances this was due to the existence of some outlying countries. By considering other growth elements such as population heterogeneity, institutions, macroeconomic stability and geography in the openness-growth link the significance of the openness variables ended.

Chen (1999) stated that East Asia and Latin America during the last two decades have observed economic growth differences. He argued that in both regions due to the government policies, openness may be an essential element causes this result. He constructed a model for the sample of 34 countries to highlight the positive link between trade openness and economic growth. To measure the openness he selected the group of five measures, comprising of price, quantitative and qualitative measures. The results supported their assumption both in impact and degree.

Rizavi, Khan, and Mustafa (2010) mainly focused on the three largest economies of South Asia with many other models a panel data model applied to a panel dataset of India, Pakistan and Bangladesh for the time period of 1980 to 2008. Their results confirmed that openness played an important part in the economic growth of South Asia during the period 1980-2008.

Vamvakidis (2002) studied the relationship between international trade openness and economic growth for developed and developing countries using cross-section data for the time period of 1920-1990. The findings of the study revealed that before 1970 the link between international trade openness and economic growth was negative and the positive link between purported

variable was a current phenomenon. The results proposed that for economic growth no gain from international trade openness during high protection in the world economy.

## 2.2 Financial development and Economic Growth

Financial markets carry out numerous activities which in turn implement a positive impact on growth (Levine, 1997) they decrease the liquidity and risk, make the resource allocation better, efficient corporate control and monitoring, saving mobilization, deeper financial systems are connected to provide these financial services to real sector.

Luintel, Khan, Arestis, and Theodoridis (2008) highlighted the shortcomings and re-examined the issue that financial structure was irrelevant as concluded by current empirical work on financial structure and economic growth. They utilized time series data and Dynamic Heterogeneous Panel methods for 14 countries. Tests showed that dataset of cross country cannot be pooled. Financial structure significantly explained output levels in most countries. The findings of the study indicated that financial structure and financial development matter for output levels and economic growth.

Economists and policymakers over a century have debated relative benefits of bank versus market based financial systems; but the recent research debates that to separate the financial system in classifying countries is not very beneficial. Levine (2002) studied the link between financial structure and growth, for this he needed a measure for financial structure. But there was no equivalently known definition of bank or market based financial system. So, he made the mixture of measures for forty eight countries for the time period of 1980 to 1995. The results showed that though the financial development was strongly connected with economic growth but no support for the bank or market based view.

Chakraborty and Ray (2006) studied in an endogenous growth model the bank and market based financial systems. Loan to firm charged with moral hazard, as owners enjoyed the private benefits, may decrease the investment. Firm financing choices developed the bank-based or market-based system. Clearly no system was well for growth which significantly depended on the proficiency of financial and legal institutions. But a bank –based system beat the market-based beside other dimensions. In a bank-based system investment and per capita income were higher and lower the income inequality and for broad-based industrialization these systems were also more favourable.

Narayan and Narayan (2013) examined the effect of the financial system on economic growth for a panel of 65 developing countries. The innovation of their paper was that they investigated these relationships for several regional panels. They found for full panel of 65 countries that financial sector led growth while a negative effect of banking credit on economic growth, at regional level, for Middle Eastern countries neither the financial nor banking sector contributed to economic growth. Financial development and economic growth comparatively played a weak role except for Asia. Finally, excluding the Middle Eastern countries, strong evidence was found that bank credit have a significant and negative impact on economic growth.

The differences in financial development are noticeable between advanced and developing nations. Both theoretically and empirically, it has been witnessed that in countries' financial systems differences are a source of comparative advantage and trade. Do and Levchenko (2004) constructed a model in which the economy's productive structure results for a country's equilibrium financial development. When a wealthy and a poor country open to trade , the wealthy country sectors depending on finance; developed which in turn made the financial system efficient while in poor country vice versa. They checked their model by taking the data of

financial development for 77 countries and found that in wealthier economies trade openness was connected with faster financial development and in poor economies connected with slower financial development.

Pradhan, Arvin, Hall, and Bahmani (2014) examined relationship between banking sector and stock market developments, economic growth, and four other macroeconomic variables namely foreign direct investment (FDI), trade openness (OPE), rate of inflation (INF), and government consumption expenditure(GCE). The study was for ASEAN countries covering the time period from 1961 to 2012. For development indices and to check the Granger causalities, they used Principal Component Analysis and panel vector auto-regressive model respectively, and found the existence of both unidirectional and bidirectional causality between these variables.

Memon, Bhutto, Sadhwani, Bux and Butt (2011) examined the relationship between financial development and economic growth with the hypothesis whether financial development promotes or impedes the economic growth in six[4] SAARC countries for the time period of 1980-2009. They applied liner-log model and found that financial development significantly affect the economic growth through financial liberalization in SAARC countries.

Many researchers choose the cross sectional analysis in their studies to investigate the relationship between financial development and economic growth. For example, Apergis, Filippidis, and Economidou (2007) used co-integration approach to examine financial development and economic growth link for 15 OECD and 50 non- OECD countries covering the time period from 1975-2000. The results showed long run relationship between financial development and economic growth. Andini (2009) used cross sectional analysis to check the

[4] Pakistan, India, Bangladesh, Bhutan, Nepal and Sri Lanka

causality between financial intermediation and growth and found that financial development positively influenced the economic growth. Benhabib and Spiegel (2000) used panel data in their study and studied the relationship between financial development and economic growth and result revealed that with both investment and factor productivity growth the financial development was linked.

Ono (2012) studied for Russian economy the financial development and economic growth relationship for the second quarter of 1999 to end of the second quarter of 2008. For financial development he used money supply (M2) and loans to GDP as proxy variables. He found that money supply started the economic growth but loan lead by economic growth, showed the features of the Russian economy. When oil price increased, under the insufficient sterilization instruments money supply increased which encouraged the economic growth. On the contrary, for banks in Russian economy boom which gave them the reason to increase the loan have a limited role to encourage the economic growth.

Asghar and Hussain (2014) analysed the underlying relationship between financial development and economic growth for developing countries for the time period of 1978-2012. The analysis has been carried out through panel co-integration tests to check the existence of long-run relationship between the variables. The study more explicitly analysed the channels through which financial development may possibly effect the economic growth with regards to FDI and trade openness. The study found in developing countries strong signs of long-run relationship between financial development and economic growth. There was bi-directional causality between financial development and FDI. Moreover, in all the countries trade openness has impact on financial development.

Samargandi, Fidrmuc, and Ghosh (2014) examined the financial development effects on economic growth, by considering an oil rich economy Saudi Arabia. They differentiate between the effects of financial development on an oil and non-oil sectors of the economy. They used ARDL bounds test methods and found that financial development for the growth of non-oil and oil sector has a positive and for later sector is either negative or insignificant. As a whole economy, they found insignificant or negative impact of financial development and for oil sector they believed this was a significant finding. This recommends that in resource-dominated economies the relationship between financial development and growth may be basically different.

Samargandi, Fidrmuc, and Ghosh (2015) re-examined in a panel of 52 countries the financial development and economic growth relationship for the period of 1980-2008. They used pooled mean group estimations in a dynamic heterogeneous panel setting. The result showed in the long run an inverted U-shaped relationship between financial development and economic growth and the result was insignificant suggested that in middle income countries, excessive finance be able to apply a negative impact on growth. On growth the result of a non-monotonic impact of financial development was confirmed by evaluating a threshold model.

Some empirical studies about the effect of financial development on economic growth showed the possible negative relation between finance and economic growth. Van Wijnbergen (1983) and Buffie (1984) found negative impact of financial development on economic growth. They discussed that the financial sector liberalization at higher level results in falling the total credit to domestic firms, in that way decreased the investment and slow down the economic growth.

De Gregorio and Guidotti (1995) studied the growth and financial development empirical relationship, ratio between bank credit to the private sector and GDP used as proxy. The results of the study showed that the proxy of financial development in a sample of large cross-country was positively linked with economic growth, but across countries its effect changed, and in a panel data for Latin America it was negative. They claimed that the last findings were due to the financial development in a poor administrative environment.

Al-Malkawi, Marashdeh, and Abdullah (2012) studied the relationship between financial development and economic growth for United Arab Emirates (UAE) for the time period of 1974-2008. They used the Autoregressive Distributed Lag (ARDL) approach to co-integration. They used financial depth (M2/GDP) and credit provided to private sector by commercial banks as %GDP as indicators of financial development. They found negative and significant link between financial development and economic growth. Bi-directional causality also suggested by the results of the study between the two variables.

## 2.3 Financial Development, Trade Openness and Economic Growth

It has been theoretically discussed that both financial development and trade liberalization may perform a vital part in the economic growth. Trade openness makes the process of production efficient and financial development between investors and savers simplify the intermediation. So, trade openness and financial development have a lot of potential to positively affect the economic growth. Roubini and Sala-i-Martin(1991) focused the relationship between trade openness and economic growth and financial development and economic growth. In general, it is discussed that the trade openness and financial development positively affect the economic growth. Many empirical studies concluded the reason which claimed that as compare to inward

oriented the outward oriented economies show the higher economic growth (Wong, 2005) . It was somewhat in line with the failure of import–substitution policies Yanikkaya (2003), and from trade liberalization exaggerated expectations.

During the last two decades of 20th century after the development of an endogenous growth theory, the impact of financial and trade regimes on economic growth have been a most discussed theoretical issue. As oppose to the neo-classical growth theory, the endogenous growth theory suggests that trade policies may have a significant effect on the long-term rate of economic growth as followed in country. To this end, in the 1980s most developing countries, in order to increase their economic growth, started to liberalize their trade and financial sectors, as previously they were following the restrictive trade policies. The main debate for this policy change was that the liberalization of both trade and financial policies make the process of production better and stimulate the economic growth.

Most of the empirical studies explain the positive impact of trade liberalization policies in terms of efficiency and productivity perspective. Kar, Peker, and Kaplan (2008) investigated the joint effects of trade liberalization and financial development on economic growth in Turkey for the period of 1960-2004. They employed Principal Component Analysis to develop indexes to measure the trade liberalization, financial development and their joint effects. The empirical findings from Johansen Co-integration showed that trade liberalization, financial development and their joint impact both positively contributed to economic growth in Turkey.

Kar, Nazlioglu, and Agir (2014) studied the direction of causality among trade openness, financial development and economic growth in Turkey. They used monthly data from January, 1989 to November 2007 and used the liner and non-liner methods, both approaches approved the

strong relations among trade openness, financial development and economic growth in Turkey. Their results to a certain extent indicated that Turkey economic growth relies upon trade openness through finance.

Soukhakian (2007) examined the causal relationship between financial development, trade openness and economic growth for economy of Japan taking time period from 1960 to 2003. The results of the study found the long run relationship between trade openness, financial development and economic growth in japan. The outcomes of Granger Causality test recommend that financial development measured by broad money was the driver of economic growth. These results favoured the supply–leading growth hypothesis and growth–driven trade hypothesis for the economy of japan. So, these findings declared that economic growth bring "more efficient imports and exports" for Japan.

Ogbonna (2010) studied for Benin Republic the direct and indirect causal relations between trade openness, financial deepening and economic growth by using the co-integration and granger causality method for the time period of 1960-2008. The view that financial development stimulates the economic growth and growth advance the trade openness in Benin Republic was supported by empirical evidence. The results of the study recommend for the Republic of Benin, that with the options to decrease lending rate and increase deposit rate to minimize the interest rate spread for the development of domestic economy through financial system. These options prompt increment in deposit creation, domestic credit, and consequently in the level of economic activities.

Chimobi (2010) examined the underlying relationship among trade openness, financial development and economic growth for the economy of Nigeria for the time period of 1970-2005.

He used Co-integration and Granger Causality tests. The empirical results of Granger-Causality suggested the causal effect of both trade openness and financial development on economic growth and vice versa, indicating the support for growth–led trade. The proxies of financial development (Domestic and Private Credits, and broad money, as % of GDP) exhibited no impact on economic growth, while economic growth realized the requirement of these credits and supply of money. Similarly, money supply was the only proxy of financial development that was seen to bring about trade openness.

For the economy of Saudi Arabia Rehman, Ali, and Nasir (2015) examined the association between financial development, trade openness and economic growth from 1971 to 2012. They used unit root, co-integration, Granger Causality test and Vector Error Correction Model (VECM) test. The presence of long run relationship among the proposed variables was supported by the results of Juselius and Johnsen co-integration test. The results from Granger causality test revealed that in Saudi Arabia the unidirectional causality functioning from trade openness to economic growth and growth also bring financial development. The outcomes showed the existences of joint causality among the variables. The study supports that increasing speed of financial development is coupled with improving the extent of trade openness for invigorating the economic growth in the country.

Arouri, Uddin, Nawaz, Shahbaz, and Teulon (2014) explored the relationship between financial development, trade openness, and economic growth for the economy of Bangladesh for the time period of 1975Q1-2011Q4. They employed ARDL bounds testing approach. According to their findings financial development, trade openness and economic growth have long-run relationship. In addition their findings also supported supply-side hypothesis while financial development and

economic growth cause exports. Economic growth causes import and feedback effect exists between trade openness and economic growth.

Vaighan, Kazemi, Nezakati and Nia (2010) examined the link among growth, financial development and trade openness for seven Central Asian countries over the time period of 1993-2008. They used panel estimation techniques and results suggested that for growth, financial development was significant while trade openness has negative impact. It appeared that in Central Asian Countries trade openness policy has not worked for economic growth due to the lack of awareness to compete in a competitive situation.

Saaed and Hussain (2015) investigated the causal relationship among financial development, trade openness and economic growth for Kuwait over the period of 1977-2012 and used the vector autoregressive technique. To investigate the long-run relationship they used co-integration and granger causality tests. They used both Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test and checked the stationarity and order of integration of the data. The Johnsen multivariate method to co-integration was used to examine the long-run relationship of variables. Co-integration test suggested no co-integration vector among the openness of the economy, GDP and financial development while the granger causality tests constructed on VAR models showed a causal relationship between trade openness and economic growth and between economic growth and financial development of the economy. The findings of the study suggested the support for growth-led financial development as well as for the trade openness led-growth. In addition, the only tool of financial development which caused trade openness was the money supply.

Zghidi and Abida (2014) selected a panel of three countries[5] of North Africa and analysed the causal interactions between financial development, trade openness and economic growth for the time period of 1980-2012. They found the strong indication of a positive link between trade openness and economic growth by using the Generalized Method of Moment (GMM) panel data analysis. They also found that for financial development, trade openness look to work like a complement and, similarly in the presences of financial development variable the effect of trade openness was more prominent. In order to gain the advantage of trade liberalization efforts must be focused by local-level reforms to make sure the development of domestic financial system.

Menyah, Nazlioglu, and Wolde-Rufael (2014) studied the causal relationship between financial development, trade openness and economic growth for 21 African countries over the period of 1965-2008. They used Principal Component Analysis and developed a financial development index and for granger causality they used panel bootstrapped method. The findings of the study indicated limited support for the hypotheses of financial and trade-led growth. Their results indicated that recent efforts regarding trade liberalization and financial development did not appear to have critical effect on economic growth.

Lacheheb (2013) studied the association between openness, financial development, and economic growth in case of Algeria from 1980-2010 and used the Auto Regressive Distributed Lag (ARDL) co-integration method. The bound testing process results approved the existence of long run relationship between openness, financial development and economic growth. Findings of the study showed a positive impact of openness on economic growth. In the study one of the proxies of financial development the broad money was positive but insignificantly linked to economic growth. Similarly, both gross capital formation and labour force were insignificant. These results recommend that in Algeria in order to make the financial sector more efficient

[5] Tunisia, Morocco, and Egypt

there is a dire need of financial reforms to motivate investment/saving and consequently, long run economic growth.

Goswami (2013) examined the effect of trade openness and financial development on economic growth for five South Asian economies for the time period of 1985-2010. He employed the panel co-integration method and results showed the existence of long-run association among the variables. The analyses of study showed the existence of bi-directional causality between economic growth, financial development and trade openness.

To increase the economic growth most of the developing countries, have initiated liberalizing trade and financial sectors as both policies are supposed to be able to reduce inefficiency and cost of the production process, and effect economic growth positively. But, trade liberalization and financial development effects are ambiguous. The study of Rahim and Abedin (2014) examined the impacts of trade liberalization and financial development on economic growth in Malaysia for the period of 1970-2011. They used gross domestic product (GDP) as a proxy variable for growth and for trade liberalization and financial development, TOP and M2 proxies were used respectively. The result showed that unidirectional causality exists between economic growth and financial development. The results for trade openness and financial development were unidirectional causality or might be supposed that financial development did not Granger cause trade liberalization but, the trade liberalization Granger caused financial development.

Sabandi and Noviani (2015) designed their study to checked that in Indonesia the trade liberalization and financial development were able to affect the economic growth in time period of 1990 to 2014. They also tested the effects of the events Asian and global economic crisis of 1997 and 2008 respectively. Co-integration test that takes into account on structural break data, and ECM, the study showed that in Indonesia the trade liberalization and financial development

was capable to effect and support the economic growth. The study also showed the results about the economic crises (Asian and global) that the Asian economic (1997) crisis as compared to the global economic (2008) crisis on the economic growth of Indonesia had a negative impact.

Bojanic (2012) analysed the link of economic growth with financial development and trade openness for Bolivia and used time series data from 1940 to 2010. First, by using the bivariate co-integration system and using the methodology of co-integration the hypothesis of long-run relationship between variables has tested. Second, to define the direction of causality between indicators of economic growth and financial development, and economic growth and trade openness he used standard Granger regressions and ECM models for causality. The empirical results showed long-run association, and from the variables of financial development and trade openness to economic growth there was unidirectional Granger causality exists.

Polat, Shahbaz, Rehman, and Satti (2015) has re-examined the effect by including the trade openness with financial development and economic growth for south Africa's production function and data was taken from 1970-2011. To check the relationship between the variables they used Bayer–Hanck and co-integration method. The results of the study showed that financial development encouraged economic growth. Economic growth enhanced through the use of capital and slows down via trade openness. In South Africa the demand–side hypothesis was validated. To gain the high benefit from financial development for long run economic growth study suggested to government to redirect the trade policies.

A volume of study is available on joint impact of trade openness and financial development on economic growth for various countries. Previously researchers have done studies on SAARC region and check the impact of trade openness and financial development on economic growth. These studies were limited up to five countries analysis and not a single study used PCA to

develop financial development Index and interactive term. According to our knowledge there is no study available which covered seven SAARC countries and interactive term of trade openness and financial development to check the joint impact of trade openness and financial development on economic growth.

# Chapter 3

## An Overview of Trade Openness, Financial Development and Economic Growth in SAARC Countries

South Asian Association for Regional Cooperation (SAARC) is a geopolitical union and regionally it is an inter-governmental organization of South Asian countries. This organization has eight members Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The position of this region geographically is actually very captious; it is surrounded by the Persian Gulf and the Caspian basin as well as with the Indian Ocean and China. Due to its geopolitical position, in future this region could contribute in world economic growth.

Due to the non-availability of data regarding Afghanistan our analysis is limited to the 7 SAARC countries. In spite of the fact that there is no formal definition of which countries include in South Asia, normally the region comprises the four less developed countries, Bangladesh, Bhutan, Maldives and Nepal, and three developing countries India, Pakistan and Sri Lanka (Jain, 1999).

Data presented in table 3.1 shows that south Asia is the house of 23.70% of the world population and hold only around 3.30% of the world income. According to the World Bank Classification, three out of eight countries India, Pakistan and Sri Lanka are lower middle income countries and rest of the countries are lower income countries.

**Table 3.1: SAARC Countries Economic Indicators 2014**

| Indicators | BGD | BTN | IND | MDV | NPL | PAK | LKA | SA | World |
|---|---|---|---|---|---|---|---|---|---|
| **Population, total** | 1590 | 7650 | 1295 | 4010 | 2817 | 1850 | 2077 | 1721 | 7260 |
| **GDP (current US$)** | 1.73 | 1.96 | 2.04 | 3.06 | 1.98 | 2.4 | 8.00 | 2.58 | 7.81 |
| **GGDP (annual %)** | 6.06 | 5.45 | 7.24 | 6.48 | 5.381 | 4.73 | 4.87 | 6.85 | 2.62 |
| **GDP per capita (current US$)** | 1086.8 | 2560.52 | 1576.8 | 7640.6 | 701.7 | 1315.27 | 3852.9 | 1501.07 | 10757.3 |
| **Exports (%of GDP)** | 18.98 | 36.28 | 22.91 | 108.75 | 11.64 | 12.28 | 20.91 | 21.50 | 30.35 |
| **Imports (%of GDP)** | 25.52 | 57.33 | 25.88 | 90.11 | 41.23 | 18.72 | 28.91 | 25.61 | 29.82 |

**Source: World Development Indicators (2014)**

The economic growth of SAARC region was not splendid in the third quarter of the 20th century. However, since 1980 the GDP growth of the SAARC region has been amazing and even in some year recorded above world average. Even with poor infrastructure and low incomes, SAARC countries positively contribute to the world trade. For instance in 2014 the imports of SAARC countries were 25.61% and exports were 21.50% of the world even though the imports and exports % of GDP of the world were 29.82% and 30.35% respectively. Hence, within the existence of ethnic and geographical clashes, economical and political insecurity, relatively poor technology, fiscal deficit, undeveloped institutions and being as far according to the per capita income being poor in terms of per capita income, south Asia is making efforts to increase its share in trade with the rest of the world.



## 3.1 An Overview of Economic Growth in Selected SAARC Countries

### 3.1.1 Economic Growth in SAARC Countries

Statistics presented in table 3.2 shows that Bangladesh experienced a gradual increase in the annual GDP growth rate from 1980 to 2014 which from 3.23 percent in 1980-84 to 6.38 percent in 2010-2014.During the same time period of 1980-2014 Bhutan GDP growth faced ups and downs in 1980-1984 Bhutan has 9.39 percent average GDP growth rate. Bhutan experienced the highest and lowest average GDP growth rates 11.4 and 4.4 percent in 1985-1989 and 1990-1994 respectively. However, the average GDP growth rate of Bhutan showed surprisingly increase in 1995-1999 to 2005-2009 and reached from 6.38 percent to 8.66 percent respectively. Hence,

during the last five years 2010-2014 the average GDP growth rate of Bhutan dropped to 5.76 percent.

### 3.2: Five Years Average GDP Growth Rate (Annual%) of SAARC Countries 1980-2014

| YEARS | BGD | BTN | IND | MDV | NPL | PAK | LKA |
|---|---|---|---|---|---|---|---|
| **1980-1984** | 3.23 | 9.39 | 5.46 | 4.20 | 3.3 | 7.3 | 5.12 |
| **1985-1989** | 3.19 | 11.4 | 5.91 | 4.61 | 4.89 | 6.43 | 3.17 |
| **1990-1994** | 4.59 | 4.4 | 4.69 | 5.06 | 5.44 | 4.54 | 5.58 |
| **1995-1999** | 5.00 | 6.38 | 6.84 | 5.55 | 4.25 | 3.41 | 4.94 |
| **2000-2004** | 5.43 | 7.89 | 5.65 | 8.91 | 3.95 | 4.34 | 3.96 |
| **2005-2009** | 6.14 | 8.66 | 8.14 | 6.00 | 4.18 | 4.64 | 6.04 |
| **2010-2014** | 6.38 | 5.76 | 7.19 | 4.47 | 4.09 | 3.35 | 7.44 |

**Source: World Development Indicators (2014)**

India the largest economy of South Asia kept a sustainable GDP growth since 1980. India experienced the highest average GDP growth rate (annual %) 8.14 during the time period of 2005-2009 which slightly declined during 2010-2014 to 7.19 percent. Maldives experienced increase in the average GDP growth rate (annual %) in 1980-1984 and 2000-2004 as the rates were 4.20 and 8.14 percent respectively. However, Maldives GDP growth declined from 8.91 in 2000-2004 to 4.47 percent in 2010-2014. Nepal experienced increase in the average GDP growth rate (annual %) in the time period of 1980-1984 and 1990-1994 as the rates were 3.3 and 5.44 percent respectively. However, Nepal GDP growth rate declined in 1995-1999 and 2000-2004

from 4.25 to 3.95 percent. In 2010-2014 Nepal's average GDP growth rate was 4.09 percent which was relatively 0.09 percent low than the previous five years. Pakistan's average GDP growth rate (annual %) in 1980-1984 was 7.3 percent but due to some internal and external shocks to the economy during 1985-1989 and 1995-1999 GDP growth rates declined from 6.43 to 3.41 percent respectively. However, Pakistan average GDP growth rate surprisingly increased in 2000-2004 and 2005-2009 from 4.34 to 4.64 percent. But fail to keep the increasing trend in 2010-2014 as it dropped to 3.35 percent. Sri Lanka experienced the strong economic growth after the end of clash with Liberation Tigers of Tamil Eelam (LTTE). The average GDP growth rate of Sri Lanka in 1980-1984 was 5.12 percent and in 2010-2014 Sri Lanka experienced the 7.44 percent growth rate which is the highest among the SAARC countries during the 2010-2014.

## 3.2 An Overview of Trade Openness of SAAR Countries

### 3.2.1 Trade Openness of Selected SAARC Countries

The SAARC was developed with the objectives to develop cooperation, minimize the clash, and for the peace and social developments among the member countries. All the politicians for the discussion of common interest brought together by SAARC summits. The member countries of SAARC have permission to work together for the regional affairs as regards poverty, education, foreign affairs with the world, and technological development. In SAARC countries the significance of trade as the promoter of growth has also been realized. The SAARC economies amplifying trade openness over the years is a clear evidence of this. However, the SAARC region has far-reaching differences within the region. Although the trade-GDP ratio of South Asian countries increasing but as compare to the groups of developing and emerging economies still remained least open. In SAARC GDP the relative share of trade is remarkably increased

from 15.1 to 51.8 percent in 1970 and 2008 respectively. Where as in East Asia and Pacific, in 1970 trade to GDP ratio was 20.9 percent which escalated to 88.6 percent in 2007 (Jain & Singh, 2009).

### 3.3: Five Years Average Trade Openness (% of GDP) of SAARC Countries from 1980-2014

| YEARS | BGD | BTN | IND | MDV | NPL | PAK | LKA |
|---|---|---|---|---|---|---|---|
| **1980-1984** | 16.72 | 58.42 | 14.09 | 310.58 | 30.96 | 34.44 | 73.78 |
| **1985-1989** | 17.58 | 68.20 | 13.04 | 142.18 | 32.67 | 34.58 | 62.16 |
| **1990-1994** | 20.75 | 72.45 | 17.81 | 158.60 | 41.23 | 37.28 | 73.04 |
| **1995-1999** | 27.37 | 81.58 | 22.78 | 168.59 | 58.25 | 35.52 | 79.57 |
| **2000-2004** | 28.98 | 77.53 | 29.58 | 118.82 | 49.63 | 30.43 | 80.13 |
| **2005-2009** | 39.03 | 107.63 | 45.84 | 155.98 | 45.30 | 34.31 | 65.19 |
| **2010-2014** | 44.92 | 107.2 | 52.34 | 192.81 | 46.42 | 32.58 | 56.14 |

**Source : World Development Indicators (2014)**

Table 3.3 shows the data of average trade openness of SAARC countries which indicate that among SAARC countries, trade openness of Bangladesh and India is increasing from 1980 to 2014. From 1980 to 1999 trade openness was also increased in Bhutan however, from 2000-2004 it declined and increased up to 107.2 percent in 2014. Maldives which economy is highly depends upon the external factors among SAARC countries has the higher average trade openness. In 1980-1984 Maldives experienced the 310.58 percent of average trade openness hence, facing ups and downs in the economy from 1985 to 2014 the average trade openness was

142.18 to 192.81 percent respectively. Average trade openness of Nepal was 30.96 percent in 1980-1984 and increased up to 58.25 percent in 1995-1999. However, it declined from 49.63 to 46.42 percent in the time period of 2000 to 2014. Pakistan among SAARC countries has the lowest average trade openness. The highest average trade openness was 37.28 percent in 1990-1994. The average trade openness of Sri Lanka in 1980-1984 was 73.78 percent after experiencing the highest average trade openness 80.13 percent in 2000-2004. The average trade openness of Sri Lanka start declining that was 56.14 percent in 2010-2014.

## 3.3 Intra-Regional Trade of SAARC Countries

To complete the development goals, SAARC countries to great extent have realized that the regional approaches are very important. There are innumerable benefits of following regional cooperation and integration because it is the process through which the economic system of a country evolves into more interconnected regionally. The key objective of regional integration is to open up the national markets and improve intra-regional trade and investment. For nations to achieve the growth now it is the need of time to expand the markets along with the development in infrastructure and integration to the international system. To make a regional approach more attractive, less developed countries like Afghanistan, Nepal and Bhutan frequently find it hard to finance large projects of infrastructure. So, to unfold the benefits of regional grouping and hence to achieve economies of scale it is important to connect small economies with the advance economies.

In Asia like other parts of the world, by means of trading plans the market association is developing very fast. However, South Asian economies, failed to move along quickly with market integration. South Asia in both goods and services is less integrated region of the world.

Intra-regional trade is very low in South Asian countries it is less than 2% as compared to East Asia where it is more than 20% (Ahmed & Ghani, 2007). So , the sub-region stayed the least integrated, even though South Asian countries have the capability for highly integrated investment, trade and production due to its geography and comparative advantages (Tewari, 2008).

Since the 1990s, to increase the South Asian economic integration various attempts have been started by several trade pacts at the bilateral, sub regional, and plurilateral levels. However, Intra-regional trade of South Asia as compare to the other region of the world is very low. As per some estimates it is around $5-6 billion per year (Akhter and Ghani, 2010).

In International relations very important developments attained due to regional integration agreements (RIAs) between and among many nations, mainly to promote international investment and trade for the formation of trading blocs regionally.

The South Asian economies were very excited on the existences of RTAs such as SAPTA and SAFTA. SAFTA which is free trade agreement among SAARC countries is growing as indicated in the table 3.4 that the intra-regional trade increased from 2.7 percent in 1990 to 5.2 percent in 2014.

**Table 3.4: Reginal and World Trade Share of SAARC Countries from 1990-2014**

| | SAARC | | | | |
|---|---|---|---|---|---|
| | SAARC | | | WORLD | |
| Period | Intra-SAARC Total Trade in Billions US$ | As Percentage of SAARC's Total Trade With Rest of The World | Total Trade Growth Rate of SAARC (%) | Total Trade in Billions US$ | Total Trade Growth Rate (%) |
| 1990 | 1.8 | 2.7 | N/A | 66.2 | N/A |
| 1995 | 4.4 | 4.2 | 43.7 | 104.4 | 26.9 |
| 2000 | 6.2 | 4.4 | 21.4 | 142.8 | 10.6 |
| 2005 | 17.3 | 5.5 | 30.7 | 324.1 | 32.4 |
| 2010 | 33.2 | 4.5 | 41.3 | 720.6 | 33.9 |
| 2014 | 52.4 | 5.2 | 16.5 | 985.2 | 0.99 |

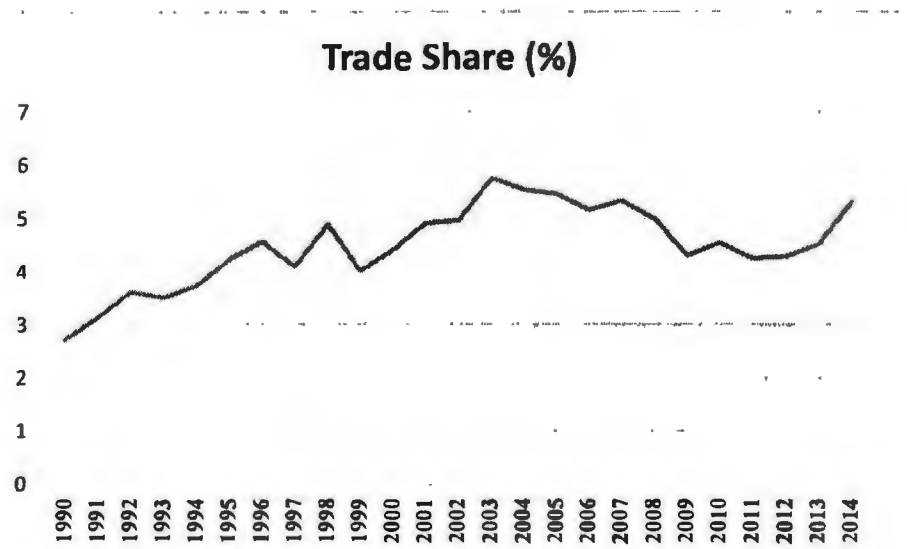
**Source: Asia Regional Integration Centre (ARIC) 2014**

### 3.3.1 SAARC's Share of Trade in World

It is evident from figure 1 that for SAARC the share of intra-regional trade among the member countries is very slow. For example, even after almost 30 years of SAARC formation in 2012 the intra-regional trade was only 4.3% of SAARC intra-regional trade of the total trade of south Asia trade. The impression given by the SAARC countries look like they are close to the world market and by ignoring the SAFTA they are making their approach more strengthen. So, this is

the reason why the trade in intra-region has drop down and retrain in 2012 just 4 percent of the region's total trade. It increased to 5.2% in 2014 which is still low.

Fig: 1 SAARC's Share of Trade in World




**Source: Asia Regional Integration Centre (ARIC) 2014**

## 3.1.1 Country Wise Contribution of SAARC Countries in Regional Trade

The table 3.5 shows that the ratio of intra-regional trade of individual countries in the region is different. Among the SAARC countries India and Pakistan have very low trade ratio as 2.97% and 7.20% respectively in 2014.

During the same time period as compare to India and Pakistan countries like Bangladesh, Maldives and Sri Lanka have much better trade ratio 10.27%, 14.32 % and 18.90% respectively. Nepal among the SAARC member countries has the highest trade ratio 57.88% in 2014.

**Table 3.5: Intra-regional Trade Share of South Asia's Total Trade**

| Reporter | Bangladesh | Bhutan | India | Maldives | Nepal | Pakistan | Sri Lanka |
|---|---|---|---|---|---|---|---|
| Partner | SAARC | SAARC | SAARC | SAARC | SAARC | SAARC | SAARC |
| Indicator | Trade Share (%) | Trade Share (%) | Trade Share (%) | Trade Share (%) | Trade Share (%) | Trade Share (%) | Trade Share (%) |
| 1990 | 5.98 | N/A | 1.57 | 12.65 | 11.88 | 2.71 | 5.64 |
| 1995 | 12.83 | N/A | 2.71 | 14.34 | 14.84 | 2.34 | 7.81 |
| 2000 | 7.89 | N/A | 2.47 | 22.22 | 39.10 | 3.54 | 7.38 |
| 2005 | 10.33 | N/A | 2.78 | 17.36 | 61.87 | 6.18 | 17.29 |
| 2010 | 10.82 | N/A | 2.30 | 15.31 | 59.05 | 8.37 | 15.66 |
| 2014 | 10.27 | N/A | 2.97 | 14.32 | 57.88 | 7.20 | 18.90 |

**Source: Asia Regional Integration Center (ARIC) 2014**

## 3.2 An Over View of Financial Development of Selected SAARC Countries

To check the performance of financial sector different indicators have been used in different studies. In our study we used three proxies to measure the financial development of the selected SAARC countries. The proxy variables are M2 % of GDP, Domestic credit provided by the financial sector % of GDP and, Private credit by deposit money banks and other financial institutions % of GDP. The over view of three proxy variables are given below:

### 3.2.1 Broad Money M2 (% GDP)

Broad money M2 (% of GDP) is used to check the depth or intermediation of financial sector of the selected SAARC countries.

According to the table 3.6 Bangladesh, Bhutan, India and Nepal are those countries who experienced the increase in their average M2 (%GDP) from the 1980 to 2014. Maldives average M2 was 37.73 percent in 1980-1984 and it declined to 26.45 percent in 1985-1989. While in 1990-1994 Average M2 of Maldives slightly increased to 27.49 percent and ended up to 60.95 percent in 2010-2014. Average M2 of Pakistan increased from 41.01 percent to 45.96 percent in time period of 1980-1984 and 1995-1999 respectively. However, Pakistan average M2 declined from 43.16 percent in 2000-2004 to 42.3 percent in 2010-2014.Average M2 of Sri Lanka in 1980-1984 was 31.07 percent. The highest average M2 of Sri Lanka was 39.21 percent in 2000-2004. However, Sri Lanka average M2 declined from 38.8 percent in 2005-2009 to 38.24 percent in 2010-2014.

**Table 3.6: Five Years Average of Broad Money M2 (%GDP) of SAARC Countries from 1980-2014**

| YEARS | BGD | BTN | IND | MDV | NPL | PAK | LKA |
|---|---|---|---|---|---|---|---|
| 1980-1984 | 16.28 | 17.39 | 35.27 | 37.73 | 25.62 | 41.01 | 31.07 |
| 1985-1989 | 21.72 | 19.67 | 41.11 | 26.45 | 29.23 | 41.93 | 30.65 |
| 1990-1994 | 25.46 | 24.96 | 43.37 | 27.49 | 33.6 | 42.5 | 30.68 |
| 1995-1999 | 29.74 | 39.02 | 46.32 | 37.98 | 42.3 | 45.96 | 37.95 |
| 2000-2004 | 46.62 | 54.23 | 59.52 | 38.78 | 52.04 | 43.16 | 39.21 |
| 2005-2009 | 52.21 | 62.89 | 71.28 | 51.19 | 65.65 | 45.00 | 38.8 |
| 2010-2014 | 60.72 | 62.83 | 77.12 | 60.95 | 79.86 | 42.3 | 38.24 |

**Source: World Development Indicators (2014)**

### 3.2.2 Domestic Credit Provided by Financial Sector (% GDP)

Domestic credit provided by financial sector is another indicator for the financial sector analysis. This indicator comprises of all types of credit given through financial sector (banks, monetary authorities, and other financial corporations where data available) several sectors credited on gross basis except central government where credit is on net basis.

The data in table 3.7 show that among SAARC countries Bangladesh and Nepal have experienced the increase in their average Domestic Credit Provided by the Financial Sector (% GDP) from 1980 to 2014. Bhutan average domestic credit was 4.33 in 1980-1984 and decreased to 4.06 percent in 1985-1989. However, it increased from 9.00 to 49.2 percent during 1990-1994 and 2010-2014.

**Table 3.7: Five Years Average of Domestic Credit Provided by Financial Sector (% GDP) of SAARC Countries from 1980-2014**

| YEARS | BGD | BTN | IND | MDV | NPL | PAK | LKA |
|---|---|---|---|---|---|---|---|
| 1980-1984 | 18.68 | 4.33 | 40.71 | 64.71 | 20.48 | 49.00 | 46.83 |
| 1985-1989 | 21.56 | 4.06 | 49.48 | 40.64 | 27.21 | 53.96 | 43.12 |
| 1990-1994 | 21.14 | 9.00 | 48.43 | 33.96 | 28.04 | 52.9 | 32.85 |
| 1995-1999 | 29.47 | 6.65 | 44.94 | 31.72 | 35.76 | 51.61 | 38.44 |
| 2000-2004 | 46.78 | 14.6 | 54.86 | 30.88 | 40.08 | 39.56 | 43.09 |
| 2005-2009 | 51.85 | 24.9 | 63.57 | 69.47 | 54.1 | 46.41 | 43.64 |
| 2010-2014 | 59.05 | 49.2 | 75.34 | 85.94 | 68.59 | 46.24 | 45.11 |

**Source: World Development Indicators 2014**

Average domestic credit of India increased from 40.71 to 48.43 percent in 1980 to 1994.Hence, facing a slight decrease to 44.94 percent in 1995-1999 average domestic credit of India start increasing from 54.86 percent in 2000-2004 and 75.34 percent in 2010-2014. In 1980-1984 Maldives average domestic credit was 64.71 percent. It declined from 40.64 percent to 30.88 percent in time period of 1985-1989 and 2000-2004 respectively. However, it increased to 69.47 percent in 2005-2009 and 85.94 percent in 2010-2014.

### 3.2.3 Private Credit by Deposit Money Banks and Other Financial Institutions (% GDP)

Private credit by deposit money banks and other financial institutions to GDP (%) consist of deposited money by banks as well as other financial institutions. This proxy set apart the credit issuance to the private sector as opposite to the credit issue to the public enterprises and government. The focus of this proxy is on the intermediary's credit issuance rather than central bank. This is the measure of financial intermediary's activity in one of its key function: direct the savings to the investors. In a country higher private credit signed for the higher financing to the private sector so, higher chances for the growth and development of the private sector which means that the development and health of the economy is better. The table 3.8 shows the average private credit of Bangladesh, Bhutan, Maldives and Nepal increased during the time period of 1980 to 2014. In 2010-2014 average private credit of these countries were 48.2, 49, 88.78 and 64.6 percent respectively. In India the average private credit increased from 25.76 percent to 29.26 percent in 1980-1984 and 1985-1989 respectively. However, it declined from 23.2 percent to 22.36 percent in 1990-1994 and 1995-1999. The average private credit of India increased from 29.3 percent to 50.26 percent in 2000-2004 and 2010-2014.

**Table 3.8: Five Years Average Private Credit by Deposit Money Banks and Other Financial Institutions to (%GDP) of SAARC Countries from 1980-2014**

| YEARS | BGD | BTN | IND | MDV | NPL | PAK | LKA |
|---|---|---|---|---|---|---|---|
| **1980-1984** | 1.71 | 4.96 | 25.76 | 7.604 | 7.78 | 21.03 | 17.65 |
| **1985-1989** | 2.79 | 7.92 | 29.26 | 10.73 | 9.61 | 25.76 | 19.17 |
| **1990-1994** | 4.56 | 12.6 | 23.2 | 15.14 | 13.00 | 22.36 | 11.42 |
| **1995-1999** | 7.43 | 20.7 | 22.36 | 21.36 | 22.9 | 23.28 | 26.00 |
| **2000-2004** | 12.1 | 26.5 | 29.3 | 30.15 | 26.3 | 22.04 | 26.86 |
| **2005-2009** | 22.6 | 34.5 | 40.79 | 64.6 | 33.9 | 26.59 | 28.99 |
| **2010-2014** | 48.2 | 49.00 | 50.26 | 88.78 | 64.6 | 19.23 | 27.6 |

**Source: World Development Indicators 2014**

Pakistan average private credit was 21.03 percent in 1980-1984. Pakistan highest average private credit was 26.59 percent in 2005-2009 and the lowest was 19.23 percent in 2010-2014. Sri Lanka average private credit increased from17.65 to 19.17 percent in 1980-1984 and 1985-1989; hence, it declined to 11.42 percent in 1990-1994. However, in 1995-1999 it increased from 26 percent to 27.60 percent in 2010-2014.

## 3.2.4 Overall Financial Development of SAARC Countries

In a country financial system plays an important part in allocation and mobilization of savings for productive use and also provides a mechanism for the monetary management. The financial system also provides help to companies and businesses to minimize the risk in their productive processes, and assist in upgradation and diversification of their portfolio. Moreover, financial system helps in bonding between numerous sectors of the economy and support the high level of specialized skills. Financial sector provides assistance to a country for the execution of the economic policies having attention to gain the economic growth, exchange rate stability in the economy, equilibrium in balance of payment and decrease in the unemployment level of the economy (Nzotta & Okereke, 2009).

As earlier we have checked the performance of financial sector of the SAARC countries with the proxy variables of financial development separately. In this section we shall check the financial sector performance with the help of the financial development index which we have developed by using the principle component analysis.

The data in table 3.9 shows that among SAARC countries Bangladesh, Bhutan, and Nepal experienced the increase in average financial development from 1980 to 2014. Average financial development of India increased from 40.34 to 48.94 percent in 1980-1984 and 1985-1989. However, it decreased in 1990-1994 and 1995-1999 from 47.97 to 44.76 percent. Hence, average financial development of India increased from 54.78 percent in 2000-2004 to 76.44 percent in to 2010-2014.

**Table 3.9: Five Years Average Financial Development of SAARC Countries from 1980-2014**

| YEARS | BGD | BTN | IND | MDV | NPL | PAK | LKA |
|---|---|---|---|---|---|---|---|
| 1980-1984 | 18.48 | 13769.52 | 40.34 | 59.36 | 20.53 | 42.53 | 41.08 |
| 1985-1989 | 21.50 | 15582.78 | 48.94 | 37.83 | 27.17 | 46.24 | 38.52 |
| 1990-1994 | 21.32 | 19763.83 | 47.97 | 32.44 | 28.09 | 45.33 | 31.08 |
| 1995-1999 | 29.40 | 30897.28 | 44.76 | 31.90 | 35.84 | 45.79 | 37.61 |
| 2000-2004 | 46.65 | 42938.15 | 54.78 | 31.65 | 40.26 | 38.09 | 41.16 |
| 2005-2009 | 51.76 | 49785.27 | 63.64 | 67.37 | 54.25 | 43.10 | 41.55 |
| 2010-2014 | 60.19 | 49620.49 | 76.44 | 87.33 | 70.00 | 40.86 | 43.29 |

**Source : World Development Indicators (2014)**

Maldives average financial development was 59.36 percent in 1980-1984. In 1985-1989 and 2000-2004 it declined from 37.83 to 31.65 percent respectively. While in 2005-2009 and 2010-2014 average financial development increased from 67.37 to 87.33 percent respectively. Pakistan and Sri Lanka faced ups and downs in the average financial development during the 1980 to 2014. In 1980-1984 Pakistan and Sri Lanka average financial development was 42.53 and 41.08 percent respectively and in 2010-2014 it was 40.86 and 43.29 percent.

# Chapter 4

# Methodology and Data

## 4.1 Theoretical Background

To explore the association between financial development and economic growth various studies have been carried out. However, still for researchers and as well as for academicians the way of the relationship between financial development and economic growth is an open question. In empirical findings the ambiguities might be because of the utilization of variety of variables of financial development and misspecification of empirical model. Following the Mankiw, Romer , and Weil (1992), we use Cobb-Douglas production function assuming the marginal role of capital and labour in production, production function in period ( t ) is as follow;

$$Y_t = A_t(K_t)^{\beta} L_t^{1-\beta} \qquad 0 < \beta < 1 \qquad (1)$$

Where $Y_t$ is the real domestic output, technological progress is denoted by A, capital stock and labour are denoted by K and L respectively. We extend the Cobb-Douglas production function by assuming that technology can be driven by the level of financial development and trade. In an economy financial development stimulate economic growth by increasing the capital formation.

This indicates that financial development moves the producer's incentives with increasing returns to scale towards the goods, specialization in inter-sectoral and trade flows, determined by the relative level of financial intermediation. An economy well-developed financial system can improve the capacity to gain from international trade by circulating the technological advancements to increase the economic growth (Polat et al., 2015).

International trade is also taking part in economic growth, by the efficient allocation of resources; transfer of modern technology from developed to developing countries and less developed countries exploit innovations by developed countries i.e. learning by doing effects. Hence, to incorporate the variables trade openness and financial development model take the following form

$$A_t = \phi . T_t^{\alpha} F_t^{\gamma} \qquad (2)$$

Where φ is constant, trade openness indicator is T and F is the indicator of financial development. Substituting Eq. 2 in Eq. 1:

$$y_t = \phi . T_t^{\alpha} F_t^{\gamma} K_t^{\beta} L_t^{1-\beta} \qquad (3)$$

Taking log of, Eq. 2 can be modifies as follows:

$$lny_t = ln\varphi + \alpha lnT_t + \gamma lnF_t + \beta lnK_t + 1 - \beta lnL_t \qquad (4)$$

Where $ln\phi$ is the constant term, $lnY_t$ is log of current GDP (constant), $lnF_t$ is the financial development is the composite index of three variables namely money supply (M2), domestic credit and private credit, $lnTo_t$ is log of trade openness, $lnK_t$ is physical capital and $lnL_t$ is population growth.

## 4.2 Empirical Model

As our first objective is to check the impact of trade openness on economic growth in selected SAARC countries, hence the following base model is empirically tested.

$$LNY_{it} = \alpha_0 + \alpha_1 LNTO_{it} + \alpha_2 LNX_{it} + \varepsilon_{it} \quad (1)$$

As the second objective of the study is to explore the role of financial sector development in trade openness and economic growth nexus hence, to meet the objective we incorporated the interaction term of trade openness and financial sector development($TO_{it} \times FD_{it}$) in our second empirical model.

$$LNY_{it} = \beta_0 + \beta_1 LNTO_{it} + \beta_2 LN(TO_{it} \times FD_{it}) + \beta_3 LNX_{it} + \varepsilon_{it} \quad (2)$$

Where 'i' and 't' denotes country and time period respectively.

## 4.3 Variables Definition and Construction

$Y_{it}$ = GDP at market prices (constant) taking as independent variable

$TO_{it}$ = The sum (export +import) % GDP is used as a measure of trade openness

$FD_{it}$ = Financial development measured by three proxy variables, Direct Credit (DC),

Private Credit (PC) and Money Supply (M2),

DC= Domestic credit as % of GDP

PC= Private credit as % of GDP

M2 = Broad money as % of GDP.

$X_{it}$= vector of control variables (i.e. Human capital, physical capital (investment to GDP ratio)

Population growth etc.

All the variables are in the logarithm (LN) form.

**GDP at market prices (constant)($LNGDP_{it}$)**

GDP at market prices (constant) is the dependent variable and data for the countries under consideration is taken from World Development Indicators of World Bank (2014).

**Trade Openness($LNTO_{it}$)**

The sum of exports and imports of goods and services as % of GDP is used for trade openness. Data for trade openness is obtained from the World Development Indicators (WDI) 2014.

**Human Capital ($HC_{it}$)**

Human capital is one of the most significant determinants of economic growth. It is calculated by both education and health. In this study we used health expenditure as a percentage of GDP. Data is taken from World Development Indicators (WDI) 2014.

**Physical Capital ($LNINV_{it}$)**

To measure the physical capital, we used investment to GDP proxy. Data for investment to GDP is taken from the economywatch 2014.

**Population Growth Rate($LNPOP_{it}$)**

It is measured as an annual percentage change in population and data is taken form World Development Indicators (WDI) 2014

**Financial Development Index ($FD_{it}$)**

"Financial development of a country refers to such elements, policy making decisions and institutions that lead to an efficient financial markets and easy access to capital and financial service" (Financial development Report, 2008).

To capture financial development, construction of variables is a hard task due to some reasons. First a number of financial institutes and agents are providing the financial services. Among them both stock markets and banks play an important role. In order to see the whole scenario, we

have to consider different elements of financial development for example, whether countries under consideration have financial sector dominated by stock market or the banks or both. However, our objective is to explore the long-run relationship hence, we use bank-based financial proxies.

Our first measure of financial development is M2 as % of GDP to capture the overall size and depth of the financial sector. A number of studies used M2 a standard proxy for financial development such as (Asghar & Hussain, 2014; Luqman, Haq , and Lal, 2013; Chimobi, 2010 ; Samargandi et al., 2014).

Our second proxy for the financial development is domestic credit provided by financial sector % of GDP consist of all credit to several sectors on a gross basis, with the exemption of credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations; examples of other financial corporations are finance and leasing companies, insurance companies, money lenders pension funds, and foreign exchange companies. This proxy is used by (Pradhan et al., 2014 ; Menyah et al., 2014).

Our third proxy for the financial development is private credit by deposit money banks and other financial institutions % of GDP consist of the deposited money by banks as well as other financial institutions. This proxy set apart the credit issuance to the private sector as opposite to the credit issue to the public enterprises and government. The focus of this proxy is on the intermediary's credit issuance rather than central bank. This is the measure of financial intermediary's activity in one of its key function: direct the savings to the investors. Rachdi (2011) previously use this indicator.

Instead of using different yet closely related variables we make an aggregate financial development indicator to signify the overall financial sector development. The resulting variables together with the three earlier mentioned variables of financial development: that M2 as a ratio of nominal GDP; domestic credit provided by financial sector to GDP; Private credit by deposit money banks and other financial institutions to GDP. The data of these three variables is taken from (WDI). We followed the Ang and McKibbin (2007), Gries, Kraft, and Meierrieks (2009) and Campos & Kinoshita, (2010) among others, used Principle Component Analysis (PCA) to merge these variables into one indicator. We symbolized the resulting indicator as FD. Principal Component Analysis (PCA), as designed by Karl Pearson in 1901, is a methodology to change over an arrangement of connected variables into uncorrelated ones principal components (Joliff, 2002).Utilizing numerical calculations, for example, eigenvalue decomposition of the covariance tensor or single value decomposition. There are two benefits of using the PCA as specified by (Samargandi et al., 2015). First, the variables of financial development are highly interconnected PCA helps to solve the multicollinearity problem. Second, the studies to investigate the association between financial development and economic growth have not presented any suitable proxy to capture the link; they select different proxies and find different results (Chuah, Thai, & chuah, 2004; Khan & Senhadji, 2003; King & Levine, 1993a; Savvides, 1995). Having considered the potential advantage we used this new financial development index which is capable to capture the information of original data and rather than individual variables it is a better indicator.

## 4.4 Estimation Technique

This section explains the econometric methodology to test the time series data and panel data which we used in this study. In order to choose the efficient estimation technique first we have to check the characteristics of time series data. Hence, the possibility of panel co-integration will be checked by using the panel unit root test, which provide information whether the data is stationary or non-stationary. Therefore, first of all to check the data characteristics we used some panel unit root tests, the IPS-W-statistic (Im, Pesaran, & Shine, 2003) and also ADF-Fisher tests utilizing the Augmented Dickey Fuller tests are employed to check the unit root in the data.

### 4.4.1 Panel Co-integration Tests

After checking the unit root, in the second step we used two types of panel co-integration tests. First co-integration test proposed by Pedroni (1999 and 2004) and second test proposed by Kao (1999) which is a residual based test. To check the existence of heterogeneity of co-integration Pedroni (2004) proposed two types of tests. The first test practices the within-dimension approach. It has 4 statistics, namely panel V-statistic, panel R-statistic, panel PP-statistic, and a panel ADF-statistic. In case of within dimension test statistics the first order auto-regressive term across all cross section is supposed same. The second test is based on between-dimensions approach (a group test). It consists of 3 statistics: a group R-statistic, a group PP-statistic, and a group ADF-statistic and in this group statistics, first order auto-regressive term parameter is acceptable to fluctuate across the cross section.

### 4.4.2 Panel Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Square (DOLS)

For panel co-integration model several estimation techniques have been suggested. Despite the fact that OLS estimator is (super) reliable under the panel co-integration however, to its 2nd order asymptotic bias its standards errors are not valid. A number of estimation techniques such as Fully Modified OLS (FMOLS) estimation and Dynamic OLS (DOLS) estimation have been planned to build the effective t-statistics.

Kao and Chiang (2000) showed that the ordinary OLS estimator has a significant bias in panel co-integration under small sample. To analyze the panel FMOLS and DOLS estimators small sample properties, they conducted Monte Carlo experiments and pooled the data with within-dimension. Panel FMOLS and DOLS estimators for these within-dimension specific versions, Monte Carlo results showed that over the OLS as compared to FMOLS the DOLS has superior small sample properties. On the contrary, Pedroni (2001) called attention that the within-dimension panel FMOLS and DOLS estimators suggested by Kao and Chiang (2000) could experience severe small sample size distortions.

Pedroni (2000) suggested the Fully Modified OLS estimator intended for heterogeneous co-integrated panel data. This method talks about both the problems of non-stationary regressors and simultaneity bias. This methodology of Phillips and Hansen (1990) was extended by Pedroni which for the OLS estimator considered semi-parametric correction to remove the second order bias, introduced by the endogeneity of the regressors for panel data analysis.

The Fully Modified OLS estimator to remove the trouble parameters, to correct the dependent variable use the long-run covariance matrices and after that use the simple OLS estimation

method to the variables corrected for endogeneity. Dynamic Ordinary Least Square (DOLS) associated with McCoskey and Kao (1998) and Kao and Chiang (2000). One of the main features of the DOLS regression is that in levels the explanatory variables are augmented with the lags and leads of their first difference (Saikkonen, 1991; Stock & Watson, 1993). The augmentation by leads, in addition to lags, is instrumental in allowing the regressors to be endogenous.

### 4.4.3 Data and Data Sources

As this study is about the SAARC countries so, the data set of selected SAARC member's countries is used from 1980-2014. The data for selected sample countries and variables under consideration is taken from WDI (2014) and data on investment to GDP ratio is taken from website of economy watch (2014).

# Chapter 5

# EMPIRICAL RESULTS

## 5.1 Panel Unit Root Test

To check the stationary of data we used panel unit root test. Generally, Panel unit root falls into two major types. First type is common unit root process which is employed by Levine, Lin, and Chu (2002). On the other hand second type is individual unit root process and formed by the Im, Pesaran and Shin (2003), Fisher-ADF and Fisher-PP (1984). In common unit root test persistent parameters are common across cross section and in individual unit root test persistent parameters across cross section move freely.

Among these tests the IPS test is viewed as more advanced unit root test. This test rejects the assumption of homogeneity of autoregressive coefficient. It is based on average of Augmented Dickey Fuller (ADF) test which is estimated with the assumption of serially correlated error term. Maddala and Wu (1999) proposed ADF-Fisher which is similar to IPS unit root test. It carries out heterogeneous auto-regressive coefficient and base on p-values of unit root which are estimated for each cross-sectional unit.

Panel unit root tests are more statistically significant. They explore the information about the time and cross dimension of the data. However, time series unit root tests only examine the information about the time dimension. Hence, variability of data increases with the inclusion of cross section dimension in analysis (Im, Pesaran, & Shin, 1997; Maddala & Wu, 1999; Taylor & Sarno, 1998; Hadri, 2000; Levin et al., 2002; Pesaran, 2007). Following table 5.1 presents results of unit root test.

**Table 5.1: Im, Person and Shin W-Stat and Fisher-ADF Panel Unit Root**

| Variables | Im, Person and Shin W-Stat (Intercept and Trend) | | FISHER-ADF (Intercept and Trend) | |
|---|---|---|---|---|
| | Level | First Difference | Level | First Difference |
| $LNGDP_{it}$ | 2.18370<br>(0.9855) | -10.7789<br>(0.0000) | 4.40620<br>(0.9925) | 109.948<br>(0.0000) |
| $LNTO_{it}$ | -1.24947<br>(0.1057) | -6.87566<br>(0.0000) | 24.2897<br>(0.0423) | 119.913<br>(0.0000) |
| $LNFD_{it}$ | 0.91493<br>(0.8199) | -11.0779<br>(0.0000) | 12.2538<br>(0.5859) | 115.045<br>(0.0000) |
| $LNPOP_{it}$ | -2.80684<br>(0.0025) | -6.87264<br>(0.0000) | 51.7793<br>(0.0006) | 292.728<br>(0.0000) |
| $LNINV_{it}$ | -4.76459<br>(0.0000) | -13.8924<br>(0.0000) | 50.0280<br>(0.0000) | 220.623<br>(0.0000) |
| $LNHEXP_{it}$ | 1.63570<br>(0.9490) | -11.3323<br>(0.0000) | 6.64959<br>(0.9474) | 118.252<br>(0.0000) |
| $LNTOF_{it}$ | 0.15684<br>(0.5623) | -14.9210<br>(0.0000) | 11.3137<br>(0.6612) | 164.437<br>(0.0000) |
| $LNTDC_{it}$ | -1.19428<br>(0.1162) | -13.3535<br>(0.0000) | 18.7395<br>(0.1751) | 148.763<br>(0.0000) |
| $LNTPC_{it}$ | -0.07929<br>(0.4684) | -9.57066<br>(0.0000) | 14.2359<br>(0.4323) | 98.0829<br>(0.0000) |

The results presented in table 5.1 show that except investment to GDP and annual population growth rate all the variables are non-stationary at I(0). This can be checked by analysing the values of both IPS and Fisher ADF test statistics at level of significance of 1%, 5%, and 10% respectively. However, investment to GDP and annual population growth is stationary at 1% level of significance. The results provide a strong indication of non- stationarity. So, the null

hypothesis which is the series is not stationary, of unit root is accepted. After this result on both the IPS and Fisher ADF tests all variables were checked at I(1) and results showed that all the variables are stationary at I(1). On this base we accept the alternative hypothesis which is the series is stationary and this indicates that variable are integrated at I(1).These results guide for Pedroni (2000 and 2004) test and Kao residual (1999) test for panel co- integration in order to check the long run relationship among the variables.

## 5.2 Panel Co-Integration Tests

After testing the unit root test in next step we employ two types of panel co-integration tests in order to check the long run relationship among the variables. The first test which was introduced by Pedroni (1999, 2004) and second test introduced by Kao (1999) a residual based test conforming (Engle & Granger, 1987). The first test, Pedroni's test consists of seven test statistics, four out of seven tests are based on within dimension and the rest of three are between dimension. The four panel test statistics which are based on within dimension test comprise of panel V-statistics, Panel-Rho statistics, Panel PP statistics, and panel-ADF statistics, and three between dimension panel test consist of Group-PP, Group-Rho and Group-ADF.

Now to check the presences co-integration among the variables, we employ the panel co-integration tests suggested by Pedroni (2000 and 2004) and Kao (1999) residual co-integration. Table 5.2 and 5.3 present results of Pedroni and table 5.4 presents Kao tests results respectively.

## Table 5.2: Pedroni's Test for Panel Co-Integration

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Null Hypothesis: No Co-integration** | | | | | | | | | | |
| **Alternative hypothesis: common AR coefs. (within-dimension)** | | | | | | | | | | |
| | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** |
| **Panel V-Statistic** | -2.571 | 0.994 | -2.897 | 0.998 | -2.897 | 0.998 | 84.932 | 0.000 | -2.518 | 0.994 |
| **Panel Rho-Statistic** | -0.518 | 0.301 | -0.981 | 0.163 | -0.981 | 0.163 | 0.984 | 0.837 | -2.411 | 0.007 |
| **Panel PP-Statistic** | -1.785 | 0.037 | -3.471 | 0.000 | -3.471 | 0.000 | -0.255 | 0.399 | -4.977 | 0.000 |
| **Panel ADF-Statistic** | -1.509 | 0.065 | -3.562 | 0.000 | -3.562 | 0.000 | -2.058 | 0.019 | -4.831 | 0.000 |
| **Alternative hypothesis: individual AR coefs. (between-dimension)** | | | | | | | | | | |
| | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** |
| **Group Rho-Statistic** | 0.489 | 0.687 | 0.130 | 0.552 | 0.130 | 0.552 | 2.285 | 0.988 | -0.838 | 0.200 |
| **Group PP-Statistic** | -1.942 | 0.026 | -3.233 | 0.000 | -3.233 | 0.000 | -1.418 | 0.078 | -4.196 | 0.000 |
| **Group ADF-Statistic** | -1.476 | 0.069 | -3.323 | 0.000 | -3.323 | 0.000 | -1.883 | 0.029 | 3.441 | 0.000 |

**Table 5.3: Pedroni's Test for Panel Co-Integration**

| | Model 6 | | Model 7 | | Model 8 | | MODEL 9 | |
|---|---|---|---|---|---|---|---|---|
| **Null Hypothesis: No Co-integration** | | | | | | | | |
| **Alternative hypothesis: common AR coefs. (within-dimension)** | | | | | | | | |
| | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** |
| **Panel V-Statistic** | -2.506 | 0.993 | 55.235 | 0.000 | -2.949 | 0.998 | -3.151 | 0.999 |
| **Panel Rho-Statistic** | -1.792 | 0.036 | 0.867 | 0.807 | -0.943 | 0.172 | -0.575 | 0.282 |
| **Panel PP-Statistic** | -3.611 | 0.000 | -1.500 | 0.066 | -3.357 | 0.000 | -2.629 | 0.004 |
| **Panel ADF-Statistic** | -3.179 | 0.000 | -2.157 | 0.015 | -3.454 | 0.000 | -2.220 | 0.013 |
| **Alternative hypothesis: individual AR coefs. (between-dimension)** | | | | | | | | |
| | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** | **Stat.** | **Prob.** |
| **Group Rho-Statistic** | -0.503 | 0.307 | 1.846 | 0.967 | 0.1483 | 0.559 | 0.317 | 0.624 |
| **Group PP-Statistic** | -3.268 | 0.000 | -1.419 | 0.077 | -3.243 | 0.000 | -2.617 | 0.004 |
| **Group ADF-Statistic** | -1.190 | 0.116 | -2.028 | 0.021 | -3.498 | 0.000 | -2.230 | 0.012 |

In table 5.2 and 5.3 the results of Pedroni test presented for 9 models. Results of 7 models (1,2,3,4,6,8,9) show that four out of seven test statistic reject the null hypothesis which means no co-integration. Model 5 and 7 show the results that five out of seven test statistics reject the null hypothesis means no integration, so, these results indicate the long run relationship among the variables. In the next step we apply the Kao residual co-integration test.

**Table 5.4: Kao Residual Co-Integration Test**

| Kao Residual co-integration test | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | t-stat. | Prob. | t-stat. | Prob. | t-stat. | Prob. | t-stat. | Prob. | t-stat. | Prob. |
| ADF | -2.525 | 0.005 | -3.005 | 0.001 | -3.068 | 0.001 | -3.047 | 0.001 | -1.795 | 0.036 |

| | MODEL 6 | | MODEL 7 | | Model 8 | | Model 9 | |
|---|---|---|---|---|---|---|---|---|
| | t-stat. | Prob. | t-stat. | Prob. | t-stat. | Prob. | t-stat. | Prob. |
| ADF | -3.920 | 0.000 | -2.032 | 0.021 | -3.958 | 0.000 | -2.241 | 0.012 |

Kao Residual Co-integration test also implied to check the existence of long run relationship among the variables, the results of table 5.4 indicate that null hypothesis of no co-integration is rejected. So, it is safely concluded from the , Pedroni's panel Co-integration and Kao Residual Co-Integration test results that long run relationship exist among the under consideration variables.

## 5.3 Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square Estimation (DOLS)

When we find the presences of panel co-integration, Pedroni (2000) proposed the Fully Modified Ordinary Least Squares (FMOLS) to find the long- co-integrating coefficients. The FMOLS is a better estimation technique over pooled OLS as some studied argued that it handle the problems of simultaneity biased as well as if variables have time trend. To give most precise assessment of co-integration equation FMOLS effectively explain the impact and endogeneity in the explanatory variables that can emerge due to the presences of long run equilibrium relationship among the variable

**Table 5.5: Panel Fully Modified Ordinary Least Squares (FMOLS)**

| Variables | Model 1 | Model 2 | Model 3 | MODEL 4 | MODEL 5 | MODEL6 | MODEL 7 | Model 8 | Model 9 |
|---|---|---|---|---|---|---|---|---|---|
| $LNTO_{it}$ | 2.388*** (0.000) | 0.824*** (0.002) | 1.879 *** (0.000) | -------- | -------- | -------- | -------- | 0.460* ( 0.080) | 1.474*** (0.000) |
| $LNPOP_{it}$ | 0.902** (0.014) | 1.178*** (0.000) | 1.178 *** (0.000) | 1.935*** (0.000) | 1.888*** (0.000) | 1.848*** (0.000) | 2.291*** (0.000) | 1.132*** (0.000) | 1.325*** (0.000) |
| $LNINV_{it}$ | 3.525*** (0.000) | 0.544** (0.015) | 0.544** (0.015) | 1.272*** (0.000) | 1.987*** (0.000) | 1.613*** (0.000) | 3.282*** (0.000) | 1.137*** (0.000) | 2.702*** (0.000) |
| $LNHEXP_{it}$ | 1.424*** (0.000) | 0.680 *** (0.004) | 0.680 *** (0.004) | 1.021*** (0.000) | 2.095*** (0.000) | 1.242*** (0.000) | 1.845*** (0.000) | 0.853*** (0.000) | 0.899*** (0.005) |
| $LNTOF_{it}$ | -------- | 2.704 *** (0.000) | -------- | 2.022*** (0.000) | -------- | -------- | -------- | -------- | -------- |
| $LNFD_{it}$ | -------- | -------- | 2.704 *** (0.000) | -------- | 2.805*** (0.000) | -------- | -------- | -------- | -------- |
| $LNTDC_{it}$ | -------- | -------- | -------- | -------- | -------- | 1.909*** (0.000) | -------- | 2.049*** (0.000) | -------- |
| $LNTPC_{it}$ | -------- | -------- | -------- | -------- | -------- | -------- | 1.196*** (0.000) | -------- | 0.994*** (0.000) |

Note:

i) P-value is in parenthesis.

ii) ***, **, * shows level of significance at 1%, 5%, and 10% respectively.

In table 5.5 the results of FMOLS test show that most of the variables are significant which indicate that in models the variables are significantly linked with dependent variable. In model 1 trade openness $(TO_{it})$ is our first variable of interest which is significant with positive sign which means trade openness plays an important role in economic growth and there exist long-run relationship between trade openness and economic growth. Our result is in line with the findings of (Rizavi et al., 2010; Das & Paul, 2011; Eriş & Ulaşan, 2013; Mercan et al., 2013) who argued that trade openness, plays a significant role to increase the economic growth.

In second model our main variable of interest is financial development using our interactive term trade openness and financial development $(LNTOF)_{it}$ which enter the model positively and significantly. The result indicates that financial development enhances the trade openness effects and both variables are complimentary for each other for economic growth. Our result is in line with Zghidi and Abida (2014), who used financial development and trade openness as an interactive term and found that financial development and trade openness as complimentary for each other and suggested that in the presence of financial development variable trade openness worked more efficiently.

In model 3 we use our financial development index $(LNFD)_{it}$ to check the effect of financial development on economic growth. We find financial development and trade openness both are significant with positive sign which support the claim that financial development and trade openness contribute positively to growth process. Our findings are in line with the studies of (Gosawami, 2013; Abida and Zghidi, 2014; Novian and Sabandi, 2015; Sehrawat & Giri, 2016) who argued that financial development and trade openness play a significant role in economic growth of economy.

In model 4 and 5 we check the financial development effect on economic growth through interactive term $(LNTOF)_{it}$ and financial development index $(LNFD)_{it}$ respectively, and we find both variables significant with positive sign. The positive sign of interactive term shows that trade openness and financial development are complementary and a developed financial system increases the effect of trade openness. This means that there exist a long run relationship between financial development and economic growth. The results of Jalil and Feridun (2011) study in case of pakistan also suggested the positive and significant relationship between financial development and economic growth.

In model 6 and 7 to check the financial development impact on economic growth we used financial development proxies individually and make interactive terms with trade openness. In model 6 and 7 we used domestic credit and private credit for inter active terms respectively. We find both $LNTDC_{it}$(TO*DC) and $LNTPC_{it}$ (TO*PC) variables significant with positive sign which means that trade openness with domestic credit and private credit is respectively complementary and that a well-functioning financial system increase the effect of trade openness. Our results are in line with the findings Pardhan et al. (2014) who used with other proxies, domestic credit as a proxy variable for financial development and findings of the study indicated that financial development plays significant role in economic growth. Rachdi and Mbarek (2011) used the proxy of private credit for financial development and results showed the existences of significant relationship between financial development and economic growth.

To analyze the role of domestic financial sector development in growth effectiveness of trade openness we used interactive term of domestic credit and private credit with trade openness in model 8 and 9 respectively. We find both $LNTDC_{it}$ (TO*DC) and $LNTPC_{it}$ (TO*PC) variables significant with positive sign which means that trade openness and domestic credit and private

credit respectively are complementary and that a well-functioning financial development system increase the effect of trade openness.

All the control variables population growth, investment to GDP ratio and health expenditures are significant and positively contributed to economic growth. This means that in the process of long run economic growth of selected SAARC countries human capital, physical capital and population growth rate play a significant role.

**Table 5.6: Panel Dynamic Ordinary Least Square (DOLS)**

| Variables | Model 1 | Model 2 | Model 3 | MODEL 4 | MODEL 5 | MODEL6 | MODEL 7 | Model 8 | Model 9 |
|---|---|---|---|---|---|---|---|---|---|
| $LNTO_{it}$ | 1.744*** (0.000) | 1.914*** (0.000) | 0.952** (0.029) | -------- | -------- | -------- | -------- | 0.464** (0.036) | 0.493** (0.037) |
| $LNPOP_{it}$ | 2.749*** (0.000) | 1.763*** (0.008) | 1.763 *** (0.008) | 2.233*** (0.000) | 1.739*** (0.000) | 2.135*** (0.000) | 2.327*** (0.000) | 1.773*** (0.007) | 1.796*** (0.000) |
| $LNINV_{it}$ | 3.292*** (0.000) | 0.595** (0.013) | 0.595** (0.013) | 0.899** (0.058) | 1.984*** (0.000) | 1.360*** (0.002) | 2.977*** (0.000) | 1.278*** (0.001) | 2.460*** (0.000) |
| $LNHEXP_{it}$ | 2.468*** (0.000) | 1.750*** (0.006) | 1.750 *** (0.006) | 1.089*** (0.009) | 2.031*** (0.000) | -------- | 1.517*** (0.000) | 1.840*** (0.003) | 1.831*** (0.002) |
| $LNTOF_{it}$ | -------- | 2.866 *** (0.000) | -------- | 2.115*** (0.000) | -------- | -------- | -------- | -------- | -------- |
| $LNFD_{it}$ | -------- | -------- | 2.866 *** (0.000) | -------- | 2.923*** (0.000) | -------- | -------- | -------- | -------- |
| $LNTDC_{it}$ | -------- | -------- | -------- | -------- | -------- | 1.973*** (0.000) | -------- | 2.143*** (0.000) | -------- |
| $LNTPC_{it}$ | -------- | -------- | -------- | -------- | -------- | -------- | 1.387*** (0.000) | ------- | 1.384*** (0.000) |

Note:

i) P-value is in parenthesis.
ii) ***, **, * shows level of significance at 1%, 5%, and 10% respectively

In table 5.6 the results of DOLS test show that most of the variables are significant which indicates that in models the variables are significantly linked with dependent variable. In model 1 trade openness ($TO_{it}$) is our first variable of interest which is significant with positive sign which means trade openness plays an important role in economic growth and there exist long-run relationship between trade openness and economic growth. Our result is line with the findings of (Rizavi et al., 2010 ; Paul and Das, 2011; Ulsan, 2012; Mercan et al., 2013) who argued that trade openness plays a significant role to increase the economic growth.

In second model our main variable of interest is financial development using our interactive term trade openness and financial development $(LNTOF)_{it}$ which enter the model positively and significantly. The result indicates that financial development enhances the trade openness effects and both variables are complimentary for each other for economic growth. Our result is in line with (Zghidi & Abida, 2014) who found financial development and trade openness as complimentary for each other and suggested that in the presence of financial development variable trade openness worked more efficiently.

In model 3 we use our financial development index $(LNFD)_{it}$ to check the effect of financial development. Our result is in line with the findings of (Shahiki and Sheidaei, 2012; Goswami, 2013; Sabandi & Noviani, 2015; Sehrawat & Giri, 2016) who argued that financial development and trade openness play a significant role in economic growth of the economy.

In model 4 and 5 we check the financial development effect on economic growth through interactive term $(LNTOF)_{it}$ and financial development index $(LNFD)_{it}$ respectively, and we find both variables significant with positive sign. The positive sign of interactive term shows that trade openness and financial development are complementary and that a developed financial system increases the effect of trade openness. This means that there exist a long run

relationship between financial development and economic growth (Jalil and Feridun , 2011; Sehrawat and Giri, 2016).

In model 6 and 7 we used financial development proxies individually to make interactive terms with trade openness, to check their effect on economic growth. In model 6 and 7 we used financial development proxies; domestic credit and private credit for inter active term respectively. We find both $LNTDC_{it}$ (TO*DC) and $LNTPC_{it}$ (TO*PC) variables significant with positive sign which means that trade openness, domestic credit and private credit respectively are complementary and that a well-functioning financial system increase the effect of trade openness. Our results are in line with the findings of (Zghidi & Abida, 2014; Pradhan et al., 2014).

To analyze the role of domestic financial sector development in growth effectiveness of trade openness we used interactive term of domestic credit and private credit with trade openness in model 8 and 9 respectively. We find both $LNTDC_{it}$ (TO*DC) and $LNTPC_{it}$ (TO*PC) variables significant with positive sign which means that trade openness , domestic credit and private credit respectively are complementary and that a well-functioning financial development system increase the effect of trade openness.

All the control variables population growth, investment to GDP ratio and health expenditures are significant and positively contributed to economic growth. This means that in the process of long run economic growth of selected SAARC countries human capital, physical capital and population growth rate play a significant role.

# Chapter 6

# Conclusion and Policy Recommendations

## 6.1 Conclusion

The main objectives of this study were to investigate the impact of trade openness on economic growth and explore the role of financial sector development in economic growth of selected SAARC countries. To investigate the impact of financial development on growth empirically, we construct financial development index by using the Principal Component Analysis. We have used Panel Co-Integration technique developed by (Pedroni, 2004; Kao, 1999) to examine the existence of the long run relationship among the variables under consideration. The results of the Panel Co-Integration showed the existence of long run relationship between trade openness and economic growth, and financial development and economic growth. As the results of Panel Co-Integration showed the existence of relationship among the variables we employed the Fully Modified Ordinary Least Square (FMOLS), and Dynamic Ordinary Least Square (DOLS) to estimate our empirical models. The key findings of the study are briefly summarized as follows.

The findings of the study shows that trade openness contribute to the economic growth of the selected SAARC countries positively. The overall evidence verifies the fact that financial development plays a vital role in long run growth process, as the index of financial development show statistically significant and positive sign. The other an important finding of the study is that the interactive term of trade openness and financial development hold positive sign that is statistically significant. The positive sign of interactive term shows that both variables trade openness and financial development are complementary and a developed financial system increases the effect of trade openness. So, we can conclude that both trade

openness and financial development help to increase the economic growth of the selected SAARC countries.

## 6.2 Policy Recommendations

Based on the findings of the study presented in chapter five, following are some recommendations that may direct policy about trade openness and financial development.

According to the results, the performance of SAARC countries can be made much better by increasing collaboration among them for their trade and economic welfare. To promote the trade relations SAARC countries have to eliminate all trade barriers. We suggest that SAARC countries should pay more attention to the trade openness, as it is a chance to interact and integrate with the markets of different countries and also helps domestic economy to adopt the international skills and technique. South Asia should made sincere efforts to strengthen the regional trade for economic growth.

Among SAARC countries a well-established communication network will helpful for healthier economic and regional development, as this network can provide information regarding trade requirement, domestic economic policies, opportunities for investment, demand and supply condition , and infrastructural facilities.

To keep up a sustainable economic growth, all economies need to develop the financial sector and take important measures to establish the strong relationship between financial and real sector. Additionally, countries must enhance the banking and financial governance. A well-functioning financial sector can positively encourage economic growth.

An appropriate institutional and financial frame work such as, for example for the region's countries a bank or creation of capital markets will promote a better financial flow among SAARC countries.

## 6.3 Directions for Future Research

Even though we have estimated the possible comprehensive empirical model, however there are some limitations that may be overcome in the future research.

1. Due to the data constraint, the empirical analyses have been carried out for the 7 selected countries of SAARC countries. The analysis should be extended to other developing countries.
2. Monthly, quarterly or semi-annually data can be used for research.

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# Appendix

# Principal Components Analysis

## BANGLADESH

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 2.821137 | 2.652770 | 0.9404 | 2.821137 | 0.9404 |
| 2 | 0.168366 | 0.157869 | 0.0561 | 2.989503 | 0.9965 |
| 3 | 0.010497 | --- | 0.0035 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_BGD | 0.584066 | -0.440998 | 0.681460 |
| M2_BGD | 0.587530 | -0.349589 | -0.729792 |
| PC_BGD | 0.560068 | 0.826625 | 0.054917 |

Ordinary correlations:

| | DC_BGD | M2_BGD | PC_BGD |
|---|---|---|---|
| DC_BGD | 1.000000 | | |
| M2_BGD | 0.988827 | 1.000000 | |
| PC_BGD | 0.861856 | 0.879239 | 1.000000 |

# BHUTAN

Principal Components Analysis

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 2.716885 | 2.479320 | 0.9056 | 2.716885 | 0.9056 |
| 2 | 0.237565 | 0.192015 | 0.0792 | 2.954450 | 0.9848 |
| 3 | 0.045550 | — | 0.0152 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_BTN | 0.565886 | 0.718101 | 0.405097 |
| M2_BTN | 0.567896 | -0.695683 | 0.439910 |
| PC_BTN | 0.597719 | -0.018886 | -0.801483 |

Ordinary correlations:

| | DC_BTN | M2_BTN | PC_BTN |
|---|---|---|---|
| DC_BTN | 1.000000 | | |
| M2_BTN | 0.762546 | 1.000000 | |
| PC_BTN | 0.900950 | 0.909285 | 1.000000 |

# INDIA

Principal Components Analysis

Date: 01/30/16 Time: 23:23

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 2.851775 | 2.733794 | 0.9506 | 2.851775 | 0.9506 |
| 2 | 0.117981 | 0.087737 | 0.0393 | 2.969756 | 0.9899 |
| 3 | 0.030244 | --- | 0.0101 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_IND | 0.586257 | -0.007108 | -0.810094 |
| M2_IND | 0.572699 | 0.710897 | 0.408219 |
| PC_IND | 0.572992 | -0.703261 | 0.420838 |

Ordinary correlations:

| | DC_IND | M2_IND | PC_IND |
|---|---|---|---|
| DC_IND | 1.000000 | | |
| M2_IND | 0.946881 | 1.000000 | |
| PC_IND | 0.948248 | 0.882026 | 1.000000 |

# MALDIVES

Principal Components Analysis

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 2.556535 | 2.248063 | 0.8522 | 2.556535 | 0.8522 |
| 2 | 0.308471 | 0.173477 | 0.1028 | 2.865006 | 0.9550 |
| 3 | 0.134994 | --- | 0.0450 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_MDV | 0.554902 | 0.829539 | 0.062846 |
| M2_MDV | 0.590717 | -0.339699 | -0.731887 |
| PC_MDV | 0.585780 | -0.443249 | 0.678522 |

Ordinary correlations:

| | DC_MDV | M2_MDV | PC_MDV |
|---|---|---|---|
| DC_MDV | 1.000000 | | |
| M2_MDV | 0.744871 | 1.000000 | |
| PC_MDV | 0.723336 | 0.864046 | 1.000000 |

# NEPAL

Principal Components Analysis

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 2.923830 | 2.860300 | 0.9746 | 2.923830 | 0.9746 |
| 2 | 0.063530 | 0.050890 | 0.0212 | 2.987360 | 0.9958 |
| 3 | 0.012640 | — | 0.0042 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_NPL | 0.578859 | -0.483292 | 0.656774 |
| M2_NPL | 0.580827 | -0.320942 | -0.748089 |
| PC_NPL | 0.572331 | 0.814509 | 0.094929 |

Ordinary correlations:

| | DC_NPL | M2_NPL | PC_NPL |
|---|---|---|---|
| DC_NPL | 1.000000 | | |
| M2_NPL | 0.986683 | 1.000000 | |
| PC_NPL | 0.944441 | 0.954450 | 1.000000 |

# PAKISTAN

Principal Components Analysis

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 1.662170 | 0.760955 | 0.5541 | 1.662170 | 0.5541 |
| 2 | 0.901215 | 0.464599 | 0.3004 | 2.563384 | 0.8545 |
| 3 | 0.436616 | --- | 0.1455 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_PAK | 0.401645 | 0.887179 | 0.227144 |
| M2_PAK | 0.619925 | -0.445950 | 0.645617 |
| PC_PAK | 0.674073 | -0.118497 | -0.729098 |

Ordinary correlations:

| | DC_PAK | M2_PAK | PC_PAK |
|---|---|---|---|
| DC_PAK | 1.000000 | | |
| M2_PAK | 0.121337 | 1.000000 | |
| PC_PAK | 0.282962 | 0.536679 | 1.000000 |

# SRI LANKA

Principal Components Analysis

Sample: 1980 2014

Included observations: 35

Computed using: Ordinary correlations

Extracting 3 of 3 possible components

Eigenvalues: (Sum = 3, Average = 1)

| Number | Value | Difference | Proportion | Cumulative Value | Cumulative Proportion |
|---|---|---|---|---|---|
| 1 | 2.049796 | 1.269030 | 0.6833 | 2.049796 | 0.6833 |
| 2 | 0.780766 | 0.611327 | 0.2603 | 2.830561 | 0.9435 |
| 3 | 0.169439 | --- | 0.0565 | 3.000000 | 1.0000 |

Eigenvectors (loadings):

| Variable | PC 1 | PC 2 | PC 3 |
|---|---|---|---|
| DC_LKA | 0.430431 | 0.888117 | 0.161172 |
| M2_LKA | 0.619825 | -0.420627 | 0.662488 |
| PC_LKA | 0.656160 | -0.185257 | -0.731528 |

Ordinary correlations:

| | DC_LKA | M2_LKA | PC_LKA |
|---|---|---|---|
| DC_LKA | 1.000000 | | |
| M2_LKA | 0.273293 | 1.000000 | |
| PC_LKA | 0.430491 | 0.812386 | 1.000000 |