Relationship between Real and Financial Sector Growth: A Comparative Analysis of OECD and SAARC Countries

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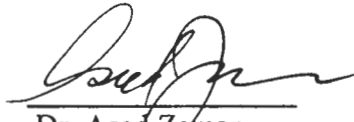## Relationship between Real and Financial Sector Growth: A Comparative Analysis of OECD and SAARC Countries

by

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Accepted by the International Institute of Islamic Economics, International Islamic University, Islamabad, as partial fulfillment of the requirements for the award of degree of MS in Economics.
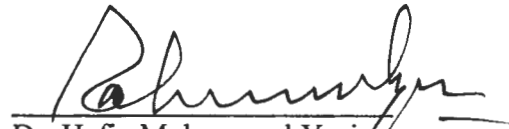
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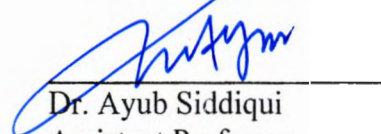
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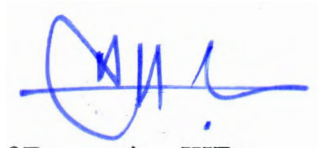
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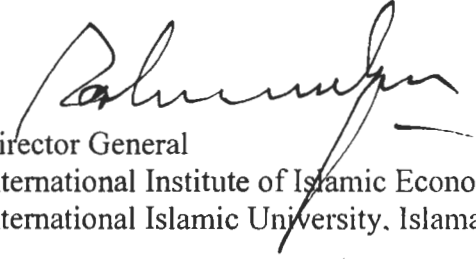Associate Professor, IIIE,
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Sehrish Tabassum

Dedication

To my Parents and Teachers.

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With the endless blessings and marvelous benevolence of Al-Mighty Allah, I was able to acquire knowledge and lay down the edifice of my present research work in a concrete form. I crossed the barriers of knowledge and wisdom with ease and achieved success in the course of my studies and research just only by His will.

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Sehrish Tabassum

Table of Contents

List of Figures

List of Tables

List of Abbreviations

CF   Capital Formation

FS   Financial Sector

GDP   Gross Domestic product

GS   Government Spending

HC   Human Capital

INF   Inflation Rate

OECD   Organization for Economic Cooperation and Development

RS   Real Sector

SAARC South Asian Association for Regional Corporation

TO   Trade Openness

WDI   World Development Indicator

Y   Initial Income level

Abstract

The share of financial sector in the GDP has increased significantly during past two decades; however, there is controversy on how the growth of financial sector (FS) affects the growth of real sector (RS). Majority of economists think that the growth of two sectors is positively associated, however, there are some contrasting opinions as well, which indicate that the growth of the two sectors are either independent or negatively correlated. Co-movement of RS and FS is important for a number of reasons. First, if the growth of FS is significantly faster than the growth of RS, this will lead to increased wealth and income inequality. Second, many economists have observed that there have been extraordinary booms in FS before all major financial crisis over the last 30 years. Therefore, it becomes very important to find relationship between these two sectors. The studies on the issue however, try to find relationship between FS and GDP growth. This study argues that it is not appropriate to analyze the relationship of FS and GDP growth because FS is a component of GDP and the positive association between the two is sure. One needs to investigate the relationship between FS and RS (GDP - FS). Therefore, this study analyzes the relationship between FS and RS growth by applying various econometric techniques for OECD and SAARC. In this study we have used the size of FS for measuring financial development instead of proxy variables used in previous studies. The study finds that the relationship between the two sectors is insignificant. The findings imply that growth rates of RS and FS are not moving together which leads to increased income inequality and financial bubbles which hit the economy badly.

Keywords: Financial development, economic growth, real sector growth, financial sector growth.

Chapter 1

Introduction

The relationship between financial development and economic growth has been widely discussed. However, there is controversy among the economists, regarding the relationship between the two variables. Most of the economists are of the view that financial development has positive impact on economic growth and it is favorable for the economy (e.g. King & Levine (1993), Beck et al. (2000), Almalkawi & Abdullah (2011)). On contrary, however, many economists also argue that financial development has either no impact or negative impact on economic growth (Ductor & Grechyna (2013) & Samargandi et al. (2013)). The supporters, of the two views, have their own logical justification regarding the relationship they assume. Some people also believe that financial deepening is the main reason behind the financial crisis (Kaminskey & Reinhart (2003), Rajan (2005)) which create threat for the overall economy and sovereignty of the country. Hence, there is no consensus among the economists regarding the relationship between financial development and economic growth.

On the other hand, the empirical literature evaluating the relationship between financial development and economic growth has a serious flaw in the methodology. Most of the studies use economic growth as dependent variable and any proxy measure of financial development as independent variable. However, as we know, financial development itself is a part of the GDP. Therefore, the positive relation between the two is sure. The question that needs to be explored is that, whether or not financial development affects real sector growth, however, the existing studies generally do not

[1]

focus on this issue. So there is need to disaggregate GDP into real and financial sector and to explore how the growths of these two components of GDP are related to each other. Without disaggregating the GDP into these two parts, analyzing the impact of financial deepening on growth will be useless.

GDP is a composition of agriculture sector, manufacturing sector and services. The service sector includes transport and communication, insurance and financial services etc. Therefore, the financial sector which consists of insurance and financial services, is itself a part of GDP. This implies that GDP must increase with the increase in financial sector. Whether or not financial sector development leads to real sector growth (GDP minus financial sector), is important to investigate, because if financial sector has no significant impact on the real sector, then it will lead to concentration of wealth in few hands and increase in income inequality and will not contribute to employment opportunities. As Tobin, (1984) pointed out that more financial development squeeze, potentials from productive sectors of the economy. For smooth economic development in an economy balanced growth of both the real and financial sector is extremely important (Ductor & Grechyna, (2013)).

It is also now well known that due to rapid financial development and speculation activities, financial bubbles can occur and cause highly inflated values of stocks and other financial assets. These bubbles can burst and cause losses of billions and trillions of dollars, as it happened during the black Monday, Asian financial crisis of (1999) and global financial crisis of (2007). Looking at the reason, behind the financial crisis, Reinhart & Roguff (2008) pointed out that financial sector development was more rapid than real sector development prior to the five biggest financial crisis in Norway (1991),

[2]

Finland (1991), Sweden (1991), Japan (1992) & USA (2007). Thus, in order to predict and warn before any financial crisis occurs, it is important to analyze how the financial sector grows in relation with the real variables.

Therefore, this study aims to investigate the relationship between financial sector development and real sector development for two group of countries i.e. OECD and SAARC, so that a reliable answer to the question, "Does financial sector development lead to real sector growth" could be found. Analysis of relation between the two variables for the OECD countries and SAARC countries would have important lesson for developed and developing countries, because the developing countries tend to follow the financial policies of the developed nations.

1.1 Relationship between Real Sector and Financial Sector Growth: Historical Overview

The graphical representation of real and financial sector growth shows that growth in real sector is relatively stable whereas financial sector growth is unstable in the long run. Figure 1.1 plots the growth rate of real sector and financial sector for Finland (1994-2013) and Pakistan (2000-2013), an OECD country and a SAARC country.

Here Finland and Pakistan are randomly chosen to overview the relationship of real and financial sector growth rates in different time period. One can see that the average growth in real sector and financial sector is approximately same, but the volatility in the growth is large for financial sector.

[3]
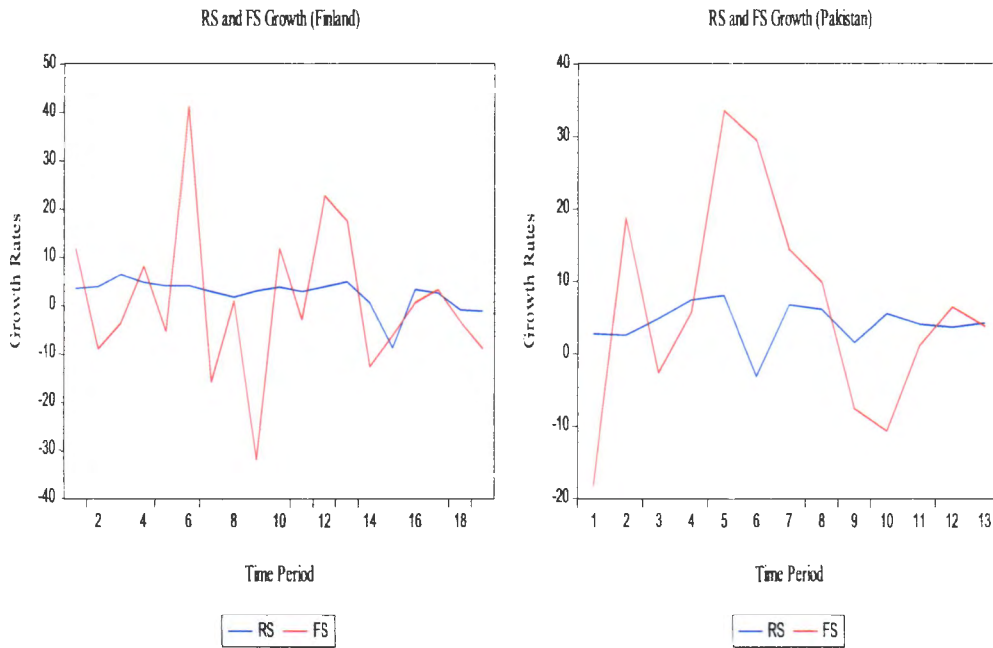
Figure 1.1: Relationships between RS and FS Growth (Finland and Pakistan)

Figure 1.2 summarizes the growth in real sector and financial sector in year 2013 of all sample countries of OECD and SAARC.
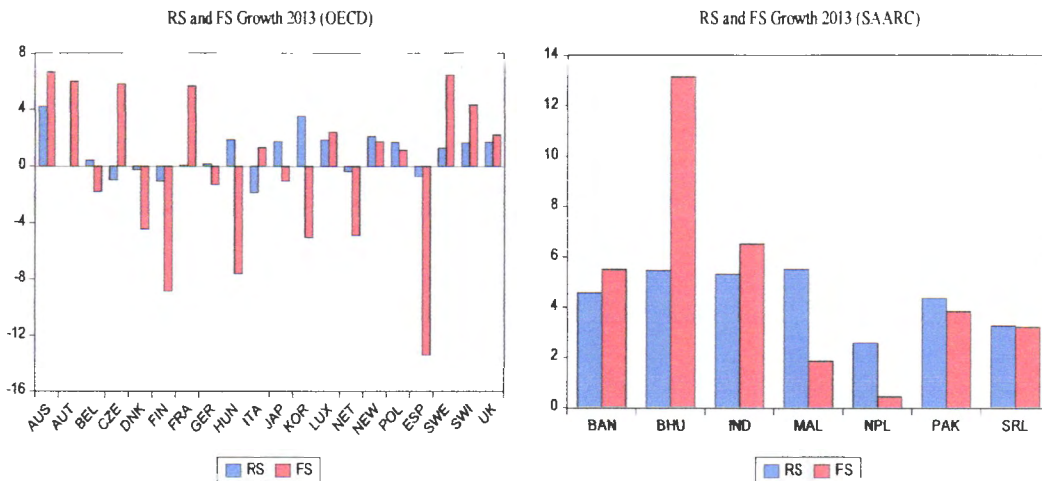
Figure 1.2: Relationships between RS and FS Growth (2013)

If we compare the real and financial sector growth rates, as figure clearly depict financial sector growth is highly volatile taking large negative and positive values in different country case of OECD. In case of Belgium, Germany, Hungary, Japan and Korea, real sector growth showing positive pattern however financial sector growth is negative. Whereas, in case of Australia, France, Luxembourg, New Zealand, Poland, Sweden, Switzerland and United Kingdom pattern show financial as well as real sector both are positive. In case of Denmark, Finland, Netherland and Spain financial sector and real sector both are negative. Finland, Hungary, Korea, and Spain show highly negative financial sector growth ranging between -5% to -11%. Figure clearly shows that financial sector growth is highly unstable in all the above sample case of OECD countries as compared to real sector growth.

On the other hand, all the SAARC countries show positive financial as well as real sector growth in the year 2013. However, there is considerable variation between growth rates of real sector and financial sector for SAARC countries.

The graphical representations (Fig 1.1 and 1.2) however, show that the growth of financial sector and real sector does not have a straight forward positive relationship as many economists anticipate. A careful analysis is therefore needed to see the relationship between the two variables.

1.2 Objectives of the Study

The main objectives of the study are

i. To investigate the relationship between financial sector development and real sector growth, by disaggregating GDP into real sector and financial sector.

[5]

ii. To analyze whether or not financial sector development leads to growth in real sector.

iii. To compare the relationship between the two sectors for OECD and SAARC countries.

1.3 Significance of the Study

Economic growth is usually measured by GDP growth which is composed of financial sector and real sector. The growth of financial sector is usually in the form of multiple credits and investing it in unproductive activities like stock markets, without having any impact on real economic activity, therefore has very little impact on the lives of individuals. So GDP growth (which includes both financial and real sector) is not a precise measure of economic development which indicates improvement in the living conditions of the individuals. Therefore it is important to explore whether the economic development that is reported in routine, is the real sector development or just development of financial sector. Therefore this study will help in getting better idea of the inclusive growth which brings change in living standard of the individuals.

While exploring the relationship between financial sector and real sector, there are lots of proxy variables being used for measuring financial development. In this study we use the exact volume (dollar value) of the financial sector, for measuring financial development which has not been used in previous studies. This study explores the new way for researchers to measure financial development in better way instead of using any proxy variable for financial sector.

1.4 Structure of the Study

Rest of the study is organized as following, Chapter 2 includes theoretical framework of the study which includes theoretical relationship of economic growth with financial development. Chapter 3 provides a brief overview of empirical dimension of the existing literature related to the study, for developed as well as developing countries.

Chapter 4 includes methodology and data description in which complete overview of estimation techniques and procedure which is adopted for determining relationship between real and financial sector growth along with complete detail of variables used in the study. Chapter 5 includes results and detailed discussion and their comparison with existing literature. Chapter 6 includes conclusion and policy implications of the study.

Chapter 2

Theoretical Background

Theoretical literature on the relationship between real sector and financial sector can be divided into four streams according to the nature of relationship. These four streams are:

2.1 Supply Leading Relationship

2.2 Demand Following Relationship

2.3 Bi-directional Relationship

2.4 No Relationship

Different economists are in favor of different postulate. The detailed description of these four streams is as under.

2.1 Supply Leading Relationship

According to this hypothesis financial sector development leads to real sector growth. The supporter of supply leading hypothesis asserts that the development of financial sector makes it easy to access funds, for investment. Therefore, it causes an increase in supply of funds and production of goods and services. There are multiple precise channels available in literature which provides support for the hypothesis. High rate of financial development leads to better allocation of resources and funds in business projects, improves risk management, mobilizes savings, facilitates exchange and transactions and exerts corporate control, which results in more capital accumulation and

[8]

technological innovation and thus rapid growth in the economy. Supporter of this hypothesis are, e.g. McKinnon (1973), King & Levine (1993), Levine et al. (2000), Christopoulos and Tsionas (2004), among others.

First, it is stated that, financial sector is very important for efficient resource allocation. A well developed financial sector causes efficient allocation of capital by providing better information about firms and economic conditions and thus leads to economic growth (Greenwood and Jovanovic (1990)). The cost of acquiring information for individual saver is high so the financial sector reduces this cost regarding investment and allocation of capital. If capital is allocated efficiently it increases productivity and leads to economic growth.

Secondly, financial sector plays essential role for risk diversification and investments in the projects where expected returns are higher (Gurley and Shaw (1955), Obstfeld (1994)). People hesitate to invest in risky projects. Financial sector makes it possible to diversify risk by providing insurance against individual risk.

Thirdly, financial system plays effective role in mobilizing individual savings towards high return activities (Acemoglu and Zilibotti (1997)). When savings are mobilized effectively it causes higher investment and promotes capital accumulation as well as technological innovation and thus leads to long term economic growth and development.

Fourthly, better financial system also helps to facilitate exchange and transactions. Financial arrangements make possible to reduce transaction costs, facilitate exchange, encourage productivity and lead to growth. (Greenwood and Smith (1997)).

[9]

Fifthly, financial intermediaries improve corporate governance, which helps in boosting firms' performance and reducing monitoring costs and thus increase productivity and lead to economic growth (Bencivenga and Smith (1993)). If creditors and shareholders' monitor firms effectively through corporate governance, then firms allocate resources efficiently and reduce risk and mismanagement of resources, which increases productivity and leads to economic growth.

The following Figure 2.1 presents the supply leading channel.
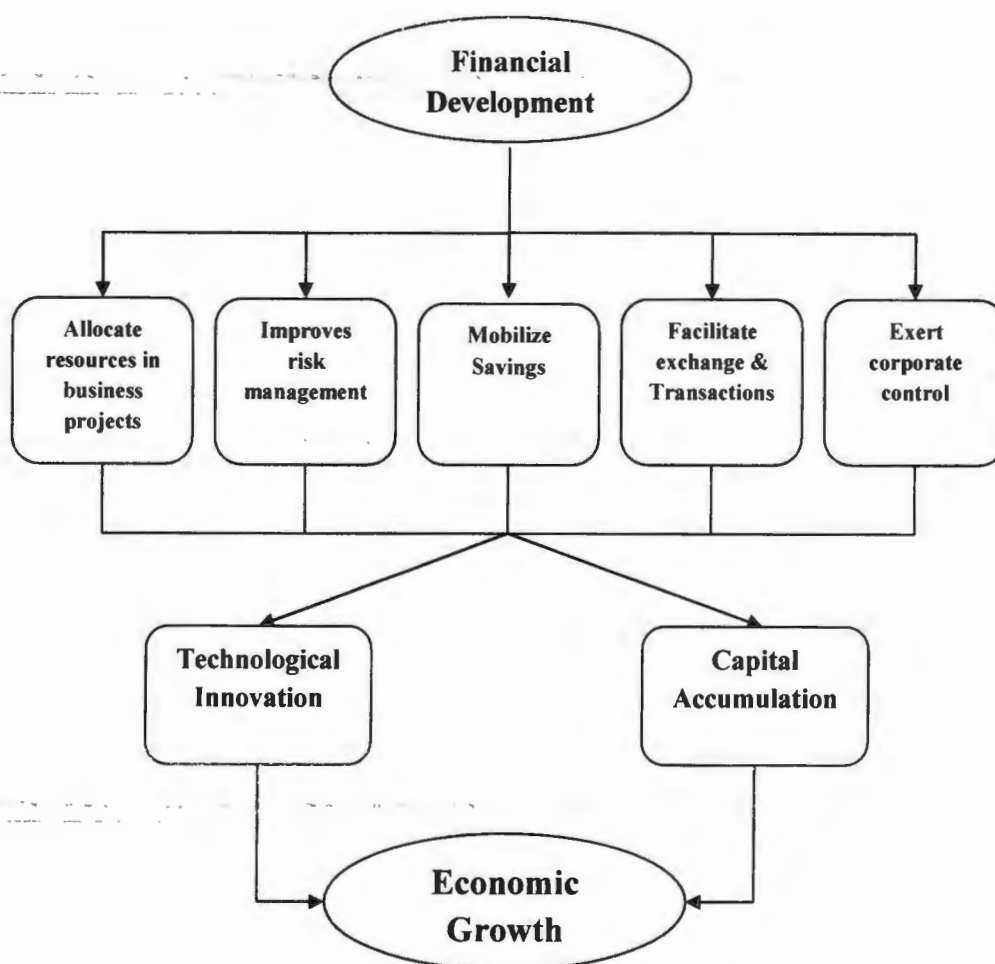
Figure 2.1: Supply Leading Channel

Thus the financial sector plays fundamental role in more capital accumulation and technological innovation and thus rapid growth in the economy.

Supporters of supply leading hypothesis, by empirically analyzing, have concluded with a positive impact of financial development on economic growth e.g. King & Levine (1993), Levine et al. (2000), Rachdi & Mbarek (2011), Almalkawi & Abdullah (2011), among others. On contrary, some economists have arrived at a negative impact of financial development on economic growth e.g. Rousseau and wachtel (2005), Samargandi et al. (2013), Ductor and Grechyna (2013) among others.

2.2 Demand Following Relationship

According to this hypothesis real sector growth leads to financial sector development. If an economy is deficient of financial sector, then it causes less demand for financial services. When real sector of the economy developed then demand for financial services arise, and these are fulfilled relatively from the financial side of the economy. Thus, the progress of the real economy encourages demand for more financial services, and as a result, new financial institutions and markets are introduced to fulfill the increased demand for financial services. In this way real sector of the economy stimulates financial sector growth and development. Supporter of this hypothesis are Robinson (1952), Kuznets (1955), Jung (1986), Demetriades & Hussein (1996), Harrison et al. (1999), Liang and Richert (2006), among others.

In the Figure 2.2 demand following channel is presented.

[11]
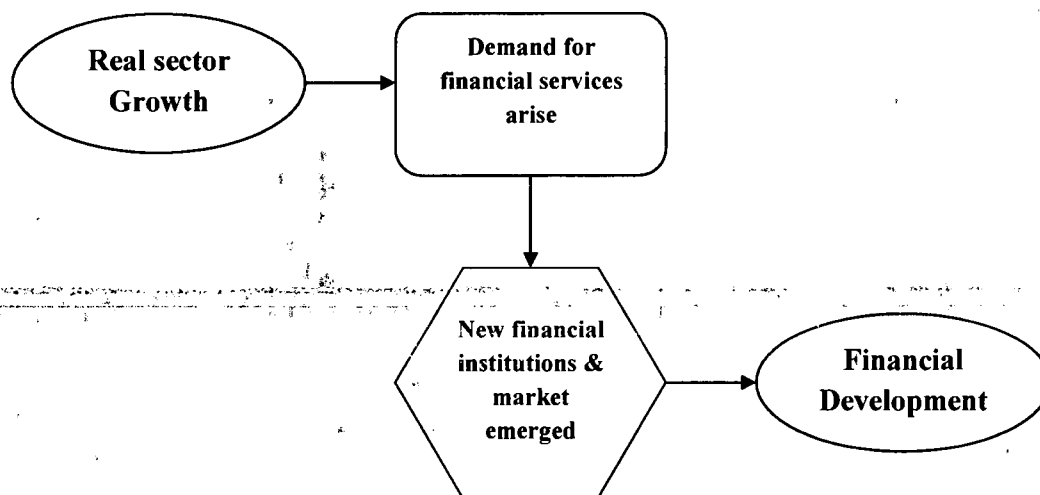
Figure 2.2: Demand Following Channel

2.3 Bi-directional Relationship

Financial sector development and real sector growth are mutually dependent, in other words, there is bidirectional causation. This idea is given by Patrick (1966) that relationship between financial development and economic growth consist of two stages. Better financial facilities lead to economic growth and in return higher growth leads to further financial development. Initially, better financial system helps to facilitate exchange and transactions. Financial arrangements make possible to reduce transaction costs, facilitate exchange and encourage productivity. There are innovations and technological progress in the financial sector and resources transferred to generate productivity. Then, the direction of causality is reversed and these productivity gains or real sector growth causes financial market development. The demand for financial services and instruments increases in the economy, then financial sector responds back to

[12]

enhanced demand, which causes further expansion of financial market. In this way real sector leads to financial development. Therefore, financial sector and real sector mutually depend on each other. Supporters of this hypothesis include Demetriades & Hussein (1996), Greenwood & Smith (1997), Harrison et al. (1999), Chuah and Thai (2004), Apergis et al. (2007), among others.

2.4 No Relationship

Financial sector development and real sector growth are independent of each other. There is no causal relationship between them. According to Lucas (1988) financial intermediaries over stress economic growth and they affect the well functioning of real sector. As Tobin (1984) pointed out, quick financial development squeezes potentials from productive sectors of the economy. Some economists are of the view that financial development causes unproductive profit seeking and speculative activities e.g. Kindleberger (1978) and Grabel (2006). Stern (1989) also does not support that financial sector has significant impact on productive sectors of the economy. The recent work done by Ram (1999), DeGregorio and Guidotti (1995), Gries et al. (2009), also supports the hypothesis that there is no solid relationship between financial development and economic growth. Acaravci et al. (2009), Dawson (2003) and Al-Zubi et al. (2006) also found insignificant impact of financial development on economic growth.

Chapter 3

Empirical Literature

Empirical review of literature is also divided into four parts. Firstly, the studies which are supported supply leading hypothesis. Secondly, the studies in support of demand following hypothesis, thirdly the studies supports of bi-directional relationship and in the end studies showing insignificant impact of financial sector on real sector.

3.1 Supply Leading Relationship between Financial Development and Economic Growth

Empirical review of literature in support of supply leading hypothesis shows positive and negative impact of financial development on economic growth. Therefore, it is divided into two parts i.e. the studies predicting positive relation between two variable and studies predicting negative relation between two variables.

3.1.1 Positive Impact of Financial Development on Economic Growth

Literature on financial development and economic growth has been explained empirically in different ways: Some researchers focus on bank based financial indicators, other on market based financial indicators and some focused on jointly bank based as well as market based financial indicator as proxy of financial development.

The empirical investigation started from King and Levine (1993) and he found positive relationship between financial development and economic growth. King and

Levine (1993), by collecting data of 80 developed and developing countries during a period of 1960-89, and using four proxy variables of financial development as liquid liabilities, private credit, banking credit and commercial plus central bank assets, found that more financial development is significantly related with higher economic growth and also emphasize that finance is very important for long term economic growth. Further it is investigated in most of research e.g. Levine & Zervous (1998), Rajan & Zingales (1998), Demirguc-Kunt & Levine (2001), Beck et al. (2000) and the results are same as initially predicted by Levine. Even in the recent work done by Apergis et al. (2007), Rachdi & Mbarek (2011), Almalkawi & Abdullah (2011), among others, and they found positive relationship between financial development and economic growth in long run.

Similarly, Khan and Senhadji (2000), also found positive relationship between financial development and economic growth. They also analyze that the effect of financial development vary with different proxy indicators of financial development, by using private sector credit, stock market capitalization and bond market capitalization as proxy variables of financial development. Levine and Zervous (1998) and Demirguc-kunt and Levine (2001), also found similar findings that effect of financial development vary by using different proxy indictors of banked based and market based.

Levine and Zervous (1998), for a sample of 47 countries, during the period 1976-1993, found positive relationship between financial development and economic growth by using both market based (turnover ratio) and bank based (banking credit) financial indicator as proxy of financial development. Similarly, Beck and Levine (2002), for a sample of 40 countries, during the period 1976-1998, by applying GMM technique, analyze that both bank based financial indicator as well as market based financial

[15]

indicator are positively related with economic growth. On a contrary, Atje and Jovanovic (1993) examined that stock market development has positive effect on economic growth while banking sector has insignificant effect on growth. Levine and Zervous (1996) also found similar results that stock market development has significant effect on economic growth whereas banking sector variables have insignificant effect. In the more recent work, Ayadi et al. (2015), for period 1984-2010, on Southern Mediterranean region also concluded the same, that stock market indicator are positively associated with economic growth whereas, credit to private sector and bank deposits are negatively associated with economic growth.

Effect of financial development is also found different according to income of different countries. Rioja and Valev (2004), from the period 1960-95 for the data of 74 countries, found that financial development has lower positive impact on high income countries as well as low income countries whereas, greater positive impact on middle income countries. Dufrenot et al. (2007) for a sample of 89 countries, during the period 1980-2006, by using four proxy variables of financial sector, found that financial development positively impact economic growth for developed OECD countries and negative for developing countries.

3.1.2 Negative Impact of Financial Development on Economic Growth and Economic Crisis

Empirical literature also support that financial development has negative impact on economic growth and sometimes it may cause financial crisis. Favara (2003), for a sample of 85 countries, by applying OLS cross regression and GMM panel estimators

during 1960-1998, by using liquid liabilities and credit to the private sector as proxy variables of financial development and found that the relationship between financial development and economic growth is weak and also found negative relationship between financial development and economic growth. Similarly, Loayza and Ranciere (2002) for a sample of 74 countries from 1960-1995, analyze that relationship between financial development and economic growth is negative especially during the period of financial crisis. Positive relationship becomes lesser in the countries which are facing financial crisis. They also found that credit boom is a major cause of negative relationship between financial development and economic growth. Similarly, Rousseau and Wachtel (2005) by applying GMM panel estimation technique, for a sample of 84 countries during 1960-2004, analyze excessive financial deepening and credit growth cause financial crisis and inhibit growth. He further investigate that for the period of 1960-89 the relationship between financial development and economic growth is positive as initially analyzed by King and Levine (1993) but during a period of financial crisis 1990-2004 the impact of financial development on economic growth become vanishing. In a recent study, Haiss et al. (2011) for a sample of 30 European countries investigate finance growth relationship by merging with financial crisis and taking aggregate variable of credit, stock and bond market as proxy of financial sector, and introducing financial crisis as dummy variable and analyze weakening impact of finance on growth. Their results show that intense deepening of financial market, not only cause to vanished finance growth relationship but also destabilize the economy. He also reconfirms the negative impact of financial development on economic growth as Rousseau and Wachtel (2005) investigate during the recent time period.

[17]

Kaminskey & Reinhart (2003), Demirguc-kunt & Detragiache (2002), Borio & Lowe (2002), Gennaioli et al. (2010) propose that rapid credit expansion increases the prospect of banking crisis, financial instability and financial fragility. Rajan (2005) also supporting this by saying that existence of a large and complex financial system had augmented the chances of "catastrophic meltdown". Similarly Arcand et al. (2012) analyze that too much finance or when credit to private sector increases, it causes negative impact on economic growth. Countries which have large and complex financial sector, does not have positive relationship between financial development and economic growth.

In a recent work, Dufrenot et al. (2007) analyze that financial development has negative impact on developing countries whereas Samargandi et al. (2013) found that financial development negatively related with economic growth in middle income countries and Ductor and Grechyna (2013) found that in highly developed countries the impact of financial development on economic growth is negative. These studies show that financial development has negative impact on lower income, middle income as well as high income countries.

3.2 Demand Following Relationship between Financial Development and Economic Growth

On contrary to supply leading, some studies empirically support demand following hypothesis that instead of financial development to increase real sector growth, economic growth has significant and positive impact to increase financial development.

Jung (1986) by using VAR approach conducted causality analysis for 56 developed and developing countries. He found uni-directional causality, demand following for developed countries whereas supply leading for developing countries. Similarly, Harrison et al. (1999) also support the demand following hypothesis. According to him, more economic growth promotes profitability and banking activity of financial sector and also promotes the chances of entry of new banks in the economy. In a recent work by Zang and Kim (2007), by using panel data of East Asian countries, also found the strong evidence that economic growth leads to financial development and no evidence of supply-leading hypothesis. Similarly, Liang and Richert (2006) by applying Granger-causality approach also found strong evidence that economic growth leads to financial sector development. Ozturk (2008) through time series analysis in Turkey also found one-way causality from economic growth to financial development.

3.3 Bi-Directional Relationship between Financial Development and Economic Growth

Some empirical research regarding the relationship between financial development and economic growth are in support of bi-directional causality that initially financial development leads to growth and in return economic growth leads to financial development.

Luintel and Khan (1999) by using VAR framework, found long run relationship and bi-directional causality between financial development and economic growth in Asian countries. In another study, Chuah and Thai (2004) by using ECM and VAR models for causality testing between financial development and economic growth and

[19]

also found bi-directional causality between financial development and growth for six countries of Gulf Cooperation Council (GCC). Their results also indicate that financial reforms are needed for development of real sector. Similarly, Apergis et al. (2007) by using panel co-integration technique estimated long run relationship between financial development and economic growth for 15 OECD countries and 50 non OECD countries, and found long run relationship exist between financial development and economic growth and also found bi-directional causality between them.

3.4 Insignificant Impact of Financial Development on Economic Growth

On a contrary, to supply leading hypothesis some studies show insignificant impact of financial development on economic growth. Some studies also do not found any evidence of long run relationship between real and financial sector. Acaravci et al. (2009) during the period of 1975-2005, investigate the causality analysis between financial development and economic growth in 24 Sub Saharan African countries by using panel co-integration and panel GMM estimation technique and found that long run relationship between financial development and economic growth never exist. In this study, banking credit, private credit and liquid liabilities are used as proxy of financial development. Similarly, Dawson (2003) by using data of 13 Central and East European courtiers, taking liquid liabilities as proxy of financial development also found that financial development has insignificant impact on economic growth. In another similar study, Al-Zubi et al. (2006) also found insignificant effect of financial development on economic growth.

3.5 Gaps in Literature

All the studies mentioned above used proxy variables for measuring financial development. Different proxy indicators used worldwide for banking sector and stock market sector in different research work. No research work found in which whole financial sector (total financial sector) or exact volume of financial sector (dollar value) considered as financial development. This is a gap in the existing literature. Hence, in the present study we used exact volume (dollar value) of financial sector for measuring financial development.

Chapter 4

Methodology and Data Description

Most of the previous studies have used proxies of financial sector[1] instead of the accurate measure of financial development. Now, with the availability of data on size of financial sector, it is possible to replace the proxies with the accurate figure of financial development. This thesis is intended to use the exact volume of financial sector (dollar value), instead of its proxies, from the available data sources. The econometric techniques consist of testing the long run relationship between real sector growth and financial sector growth and also testing the Granger causality between two variables.

4.1 Modeling Relationship between Financial Development and Economic Growth

By following King & Levine (1993) model, showing relationship between financial development and economic growth, the simple model in our case will be;

$$RS_{it} = \alpha_i + \beta_{1i}FS_{it} + \beta_{3i}X_{it} + \varepsilon_{it}$$

$$i = 1,2, \dots, N. \ t = 1,2, \dots, T$$

RS= Real sector growth (GDP minus insurance and financial services)

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[1] In literature different financial indicators are used as a proxy of financial sector. Most renowned financial sector indicator which are initially used by King and Levine 1993 and then following in other research work are liquid liabilities to GDP, private sector credit to GDP, non-financial private sector credit to total domestic credit and ratio of domestic assets to total money bank domestic assets plus central bank domestic assets. These proxy variables of financial sector are related with financial institutions.

Similarly for financial market indicators like stock market capitalization to GDP, stock market total value traded to GDP (Beck and Levine, 2002) and turnover ratio (Levine and Zervous, 1998) are used in literature for proxy of financial development.

[22]

FS= Financial sector growth (insurance and financial services)

X= Control variables

There are many variables used in literature as control variables which affect the economic growth. These control variables (X) are selected following the previous model which investigated relationship between financial development and economic growth. These variables include initial income (Y), capital formation (CF), human capital (HC), trade openness (TO), government spending (GS) and inflation rate (INF) which are previously used by Beck and Levine (2002), Andersen (2003), Rousseau and Wachtel (2009), Oguzoglu and Stengos (2011) among others.

Financial sector[2] growth is the main focus of our study. In this study we used the accurate measure of financial sector in which all the financial activities, including bank based financial activities, market based financial activities as well as insurance services are considered. It broadly covers whole financial sector which was not used in previous research work.

4.2 Redundancy Test

In order to determine the significance of the variables, Redundancy test is applied. By applying redundancy test unimportant and insignificant variables are excluded from the model and only significant variables are left behind in the model. We estimate least square panel data model and apply Wald test on all the regressors in the equation. Through Wald test joint significance of the variables are tested. The null hypothesis is

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[2] This indicator basically includes all financial service activities as monetary intermediation, insurance services and asset holding activities like holding companies, activities of trusts, funds management and similar financial entities. This broadly covers all the financial activities of financial sector (see ISIC, Revision 4, section K).

[23]

that the coefficients are not jointly significant. In this way significance of all the variables is determined in the model.

4.3 Panel Unit Root Test

A test of stationarity is the unit root test. The unit root test is used to determine whether a variable follows a random walk. For panel data the stationarity of the variables are tested by applying Im, Pesaran and Shin (IPS) test. IPS begins by indicating a separate ADF regression for each cross-section with individual effects and no time trend. The equation of IPS test is as under:

$$\Delta y_{it} = \alpha_i y_{i,t-1} + \sum_{j=1}^{\rho_i} \beta_{ij} \Delta y_{i,t-j} + X_{it}\delta + \varepsilon_{it}$$

Where null hypothesis is

H_0: $\alpha_i = 0$ for all i series and

H_1: $\alpha_i = 0$ for i = 1, 2,....., N_1

$\alpha_i < 0$, for i=N+1, N+2,.....,N.

We check the unit root of the variables for all the sample countries

4.4 Static Long Run Model Estimation

ARDL model is used to determine the static long run relationship between real and financial sector. An autoregressive distributed lag model is a model with lags of dependent as well as independent variable. ARDL model is used to estimate the long run coefficients of the model in panel data if all the variables are stationary at I(0) level. The procedure of ARDL long run model estimation is given below.

[24]

Run the regression on lags of dependent variable, independent variable and control variables used in the model.

$$Y_{it} = \alpha_i + \beta_{1i}Y_{it-1} + \beta_{2i}X_{it} + \beta_{3i}X_{it-1} + \varepsilon_{it}$$

In long run, we assume that;

$$Y_{it=}Y_{it-1=}Y \qquad X_{it=}X_{it-1=}X \qquad \varepsilon_{it=}\varepsilon$$

Arrange equation, so all Y and X terms on same side;

$$Y - \beta_{1i}Y = \alpha + \beta_{2i}X + \beta_{3i}X + \varepsilon$$

$$Y(1 - \beta_{1i}) = \alpha + (\beta_{2i} + \beta_{3i})X + \varepsilon$$

$$Y = \frac{\alpha}{(1 - \beta_{1i})} + \frac{(\beta_{2i} + \beta_{3i})}{(1 - \beta_{1i})}X + \frac{\varepsilon}{(1 - \beta_{1i})}$$

We also assume here that $\frac{\alpha}{(1-\beta_{1i})} = \theta_0$ and $\frac{(\beta_{2i}+\beta_{3i})}{(1-\beta_{1i})}X = \theta_1$ and the expected value of error terms is equal to $\frac{\varepsilon}{1-\beta_{1i}} = \mu$.

$$Y = \theta_0 + \theta_1 X + \mu$$

This is a static long run solution model and we get the results of long run coefficients of the model.

4.5 Granger-Causality Test

The main objective of the research work is to check whether financial sector development impact real sector growth. Therefore we will apply Granger causality for existence of relationship between financial sector and real sector.

The idea behind the Granger causality is that whether the past value of X helps in predicting Y. If the past values of X predicting Y than it means X Granger causes Y. In this case we will check whether FS (financial sector growth) causes RS (real sector growth). The procedure we are using for Granger causality is as follows.

1. Regress RS (real sector) on its own lags, lags of FS (financial sector) and lags of X (control variables).

$$RS_{it} = \alpha_i + \beta_{1i}RS_{it-1} + \beta_{2i}RS_{it-2} + \ldots\ldots\ldots\ldots + \beta_{3i}FS_{it-1} + \beta_{4i}FS_{it-2}$$
$$+ \ldots\ldots\ldots\ldots\beta_{5i}X_{it-1} + \beta_{6i}X_{it-2} + \ldots\ldots\ldots\ldots + \varepsilon_{it}$$

2. Test exclusion restrictions on all lags of FS via standard F test.

3. If exclusion restrictions valid than lags value of FS does not have any role in determining RS and FS (financial sector growth) does not Granger cause RS (real sector growth)

4.6 Impulse Response Function

Impulse response[3] function is used in macroeconomic modeling to describe the reaction of economic variables overtime or to check the shocks of economic variables. Impulse response demonstrates the reaction of one variable to the improvement in another variable, holding other shocks in the system equal to zero. Response of real sector will be acquired overtime, when financial sector innovate on real sector. The procedure of impulse response is following.

1. Estimate the unrestricted VAR model after unit root test.

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[3] See Hamilton 1994 for derivation of impulse response.

[26]

2. Test the impulse response of independent variable (FS) on dependent variable (RS).

4.7 Data Description

Annual data are collected from 1994-2013 of financially developed OECD countries and from 2000-2013 for developing SAARC countries. OECD includes 32 developed nations of the world whereas SAARC countries include eight developing nations of South Asia. We selected 20 OECD countries and 7 SAARC countries on the basis of data availability.

The data of all the control variables are collected from WDI whereas the data of GDP and FS are collected from national accounts data of OECD Statistics and national accounts data of SAARC countries[4]. In OECD statistics sector wise disaggregation of GDP is given whereas in central bank statistics of respective SAARC countries sector wise disaggregation of GDP is available. The data of real sector are calculated by taking difference of GDP and insurance and financial services as given in OECD and SAARC statistics. Data of insurance and financial services (FS) are taken as financial sector and remaining sector wise aggregate of GDP as real sector (RS). In the end we have calculated the real growth rate of real sector and financial sector by taking lag difference of respective series.

In Table 4.1 brief descriptions of variables and their sources are given. In Table 4.2 complete statistical formulas are provided which are used for derivation of variables.

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[4] Sector wise data of SAARC countries is also available in statistical year book of SAARC 2014.

[27]

Table 4.1: Variables Description and Source

Variables	Description	Source
GDP	Gross Domestic product (Current LCU)	WDI
GDP Deflator	GDP Deflator (base year varies by country)	WDI
Financial Sector (FS)	Insurance and Financial Services (Current LCU)	OECD stats, National Accounts Stats of SAARC
GDP per capita	GDP per capita (Constant LCU)	WDI
Capital Formation (CF)	Gross Fixed Capital Formation (% of GDP)	WDI
Human Capital (HC)	Gross Secondary School Enrollment Ratio (%)	WDI
Exports (X)	Total Exports (% of GDP)	WDI
Imports (M)	Total Imports (% of GDP)	WDI
Government spending (GS)	Government Final Consumption Expenditure (% of GDP)	WDI
Consumer price index (CPI)	Consumer Price Index (2005=100)	WDI

Table 4.2: Variables Derivation by Statistical Formula

Variables	Statistics
Nominal Size of Real Sector (RS Nominal)	$rs_t = GDP_t - fs_t$
Real Size of Real Sector (RS Real)	$RS_t = \dfrac{rs_t}{(Gdp\ deflator)_t} \times 100$
Real Size of Financial Sector (FS Real)	$FS_t = \dfrac{fs_t}{(Gdp\ deflator)_t} \times 100$
Real Sector Growth (RSG)	$RSG_t = \dfrac{RS_t - RS_{t-1}}{RS_{t-1}} \times 100$
Financial Sector Growth (FSG)	$FSG_t = \dfrac{FS_t - FS_{t-1}}{FS_{t-1}} \times 100$
Initial Income (Y)	$Y_t = \ln(GDP\ per\ capita)_t$
Trade Openness (TO)	$TO_t = X_t + M_t$
Inflation Rate (INF)	$INF_t = \dfrac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \times 100$

[29]

Chapter 5

Results and Analysis

The results and analysis are divided into five sections. In section 5.1, descriptive statistical analysis of RS and FS growth are reported. In section 5.2, the relationship between RS and FS for OECD is summarized and in section 5.3, the same relationship for SAARC is discussed. In section 5.4 comparisons of OECD and SAARC are given. In the end, in section 5.5 comparisons with previous studies are given.

5.1 Descriptive Statistics Analysis of RS and FS Growth

Descriptive statistical analysis consists of numerical analysis of dependent and independent variables. It comprises large data set in few indices such as mean, median, standard deviation, maxima, minima, Jarque-bera and correlation between two variables.

Table 5.1: Descriptive Statistics of Real and Financial Sector Growth

Descriptive Statistics Analysis	OECD Statistics		SAARC Statistics	
	RS Growth	FS Growth	RS Growth	FS Growth
Mean	2.231	2.644	5.556	8.988
Median	2.450	2.563	5.459	7.876
Standard Deviation	2.590	9.144	5.990	11.117
Maxima	10.492	41.304	31.957	46.861
Minima	-8.600	-31.744	-8.455	-18.130
Jarque-Bera	151.88 (0.00)	58.41 (0.00)	183.68 (0.00)	11.36 (0.00)
Correlation	0.020		0.446	
( ), shows probability The data for OECD covers from 1994-2013 and for SAARC covers from 2000-2013.				

In Table 5.1 reported the observations of mean, median, standard deviation, correlation etc. of real and financial sector variables of our selected economies of OECD and SAARC. The mean values of RS growth and FS growth of OECD are 2.23 and 2.64 and median are 2.45 and 2.56. There is no significant difference in mean and median values of RS growth and FS growth. Standard deviation of RS is 2.59 and FS is 9.14. The standard deviation for FS growth is very large than RS growth. This implies that there is huge difference in the growth rates of financial sector for different countries, whereas real sector growth rates show smaller dispersion. However maximum (10.49, 41.30) and minimum (-8.60, -31.74) values are also obtained. The maximum and minimum value of financial sector growth is highly positive i.e. 41.30 and highly negative i.e. -31.74 as compare to real sector growth. P-values of Jarque-berra test of normality are (0.00) for both series which shows that the distributions are not normal. There is volatility in growth rates. Correlation between RS and FS is negligible i.e. 0.02 in case of OECD.

The mean values of RS growth and FS growth of SAARC countries are 5.55 and 8.98 and median are 5.45 and 7.87 respectively. Mean and median values are approximately same for RS growth whereas FS growth series showing negatively skewed distribution. Standard deviation of RS is 5.99 and FS is 11.11, likewise OECD, financial sector shows larger dispersion in growth rates as compare to real sector. However maximum (31.95, 46.86) and minimum (-8.45 and -18.13) values are also obtained. Similarly, as OECD, P-values of Jarque-berra test of normality are (0.00) which shows that growth rates are not normally distributed. Correlation between RS and FS is positive i.e. 0.44 in case of SAARC.

[31]

5.2 Relationship between RS and FS Growth: OECD Countries

For determining the relationship between RS and FS growth econometric techniques are applied and the detailed descriptions of OECD results are given in this section. Redundancy test results for OECD are reported in Table 5.2, unit root results in Table 5.3, ARDL static long run solution results in Table 5.4 and Granger-causality results in Table 5.5.

5.2.1 Redundancy Test

In order to determine the significance of the control variables in the model Redundancy test is applied. By applying redundancy test unimportant and insignificant variables excluded from the model. We adopt a procedure given in section 4.2.

Table 5.2: Wald Test Results

Method: Wald test for restrictions on coefficients Dependent Variable: RS		
Variables	**F-Statistics**	**P-Value**
FS	4.907	0.007*
Y	8.405	0.000*
CF	37.037	0.000*
HC	2.009	0.135
TO	17.407	0.000*
GS	20.978	0.000*
INF	2.961	0.050*
*, shows significance of variable.		

The results of Wald test of joint significance are reported in Table 5.2, the p-value for the variables, initial income (Y) capital formation (CF), trade openness (TO) and

[32]

government spending (GS) are 0.00 which is highly significant at 1 percent , inflation rate

(INF) has p-value 0.05 which is also significant at 5 percent whereas p-value of human

capital (HC) is 0.13 which shows that the human capital does not have significant

influence on RS growth in the given model. Therefore, all the other control variables are

found significant in the model except human capital which is excluded for further

analysis from the model.

5.2.2 Panel Unit Root Test

We applied the panel unit root test to check the stationarity of the variables. The

procedure adopted is discussed in section 4.3. The results of panel unit root test are

reported in Table 5.2.

Table 5.3: Unit Root Results

Null Hypothesis: Unit Root(Individual unit root process) Method: Im, Pesaran and Shin W-Stat		
Variables	**W-Statistics**	**P-Value**
RS	-5.522	0.000*
FS	-7.740	0.000*
Y	-3.471	0.000*
CF	-3.007	0.001*
TO	-2.991	0.001*
GS	-2.556	0.005*
INF	-6.925	0.000*
*,shows rejection of null (having unit root)		

Results in Table 5.3 shows that all the variables are stationary as their p-value is

less than 5%, at I(0) level and null hypothesis of having unit root is rejected. Real sector

[33]

(RS), financial sector (FS), initial income (Y), capital formation (CF), trade openness
(TO) government spending (GS) and inflation rate (INF) are stationary at levels.

Panel co-integration test needs to be applied when the variables having unit root
i.e. I(1). Since, all the variables are stationary at I(0) level therefore, there is no need of
co-integration testing.

5.2.3 Static Long Run Relation between RS and FS Growth

For calculating the direction of relation between dependent and independent
variable, the unrestricted ARDL model was estimated and static long run solution is
calculated by procedure given in section 4.4.

Table 5.4: Static Long Run Coefficients Results

Method: ARDL Long Run Coefficients Model Estimation Dependent Variable: RS		
Variables	Coefficient	Probability
FS	0.029	0.168
Y	0.138	0.043*
CF	0.112	0.009*
TO	0.001	0.617
GS	-0.037	0.379
INF	-0.117	0.037*
*, shows significance of variable		

In Table 5.4 long run coefficients of model are reported. As, the coefficient of
financial sector (FS) is insignificant (P-value 0.168), which shows that there is
insignificant relation between real and financial sector growth in long run and
alternatively, the coefficient of FS is very small, which shows that the coefficient is

[34]

insignificant not only statistically, but also economically, so that 1% increase in FS is associated with only 0.03% change in RS. The results of the study are in line with Dawson (2003), Al-Zubi et al. (2006), Greis et al. (2009) and Acaravci et al. (2009) that financial sector has insignificant impact on economic growth in long time period. The results are opposing the King and Levine (1993) that financial development has positive and significant impact on economic growth.

The coefficient of initial income (Y) level is statistically and economically significant as it shows 1% rise in initial income cause 0.14% increase in real sector growth. Results contradict the convergence theory and support the theory of Romer (1986) and Lucas (1988) that initial income stimulating growth by increasing physical and human capital in an economy.

Impact of capital formation (CF) is positive and significant as the value (0.112) shows, 1% increase in capital formation causes 0.11% increase in real sector growth. It supports the previous studies of Beddies (1999) and Ghura (1997) among others. According to Lucas (1988) and Romer (1986), increase in capital formation cause perpetual impact on economic growth. More capital formation increase productivity and industrial development in the economy and thus leads to long term economic growth.

Trade openness (TO) have insignificant impact on economic growth as the value of trade openness is highly insignificant i.e. 0.00, 1% increase in trade openness causes no impact on real sector growth. Insignificant coefficient of trade openness is unexpected, as most of previous research shows positive and significant impact of trade openness on economic growth. Whereas, results support the Ulasan (2012) in which he found positive

and insignificant impact of trade openness on economic growth for OECD country case. He concluded that the results of openness in cross-country regression are very sensitive due to different determinants of growth. Government expenditures also cause to make impact of openness insignificant. He also conclude that without edifice of better institutions and to follow sound and stable fiscal policy, openness does not necessarily increase growth rates.

Coefficient of government spending (GS) is also found insignificant (-0.03) in the analysis. 1% Increase in government spending of the country causes only 0.03% decline in real sector growth. The result supports the study of (Kneller et al. (1999), Bleaney et al. (2001) and Agell et al. (2006)). It is also believed that, on aggregate impact of government expenditures are uncertain. Different components of government expenditures have different impact on economic growth.

Coefficient of inflation is negative (-0.117) and significant shows negative relationship between inflation and real sector growth. This is contrast with the Phillips curve theory, which assumes that there should be positive association between inflation and GDP growth. However, this is possible if the inflation is cost side rather than demand side inflation. It also supports the previous study of De Gregorio (1993), Levine and Zervous (1993) and Boyd et al. (1996), among others.

5.2.4 Granger-Causality Test

Now we applied Granger-causality test to check whether FS Granger causes RS. We check the null hypothesis of no Granger-causality against the alternative. The results of Granger-causality are reported in Table 5.5.

Table 5.5: Granger-Causality Test Results

Method: Granger-Causality/Block Exogeneity Wald Test Dependent Variable: RS		
Variables	**Null Hypothesis**	**P-Value**
FS	FS does not Granger Cause RS	0.274
Y	Y does not Granger Cause RS	0.098
CF	CF does not Granger Cause RS	0.707
TO	TO does not Granger Cause RS	0.635
GS	GS does not Granger Cause RS	0.034*
INF	INF does not Granger Cause RS	0.000*
*, shows rejection of null at 5 percent.		

By applying the Granger causality test, results in Table 5.5 shows that financial sector (FS) growth does not Granger causes real sector (RS) growth, having P-value (0.274) which is high. Null hypothesis of no Granger causality is accepted. The results oppose the supply leading hypothesis that financial development leads to economic growth. We see that all other variables do not appear to Granger cause growth of real sector except government spending (GS) and inflation (INF).

5.2.5 Impulse Response Function

Impulse response function is applied on financial sector (FS) and real sector (RS). Impulse response shows behavior of real sector when financial sector innovate on real sector. Here, 10 years of time span selected to see the impact of FS innovation on RS. In the following Figure 5.1 the behavior of FS impulse on RS is represented.

[37]
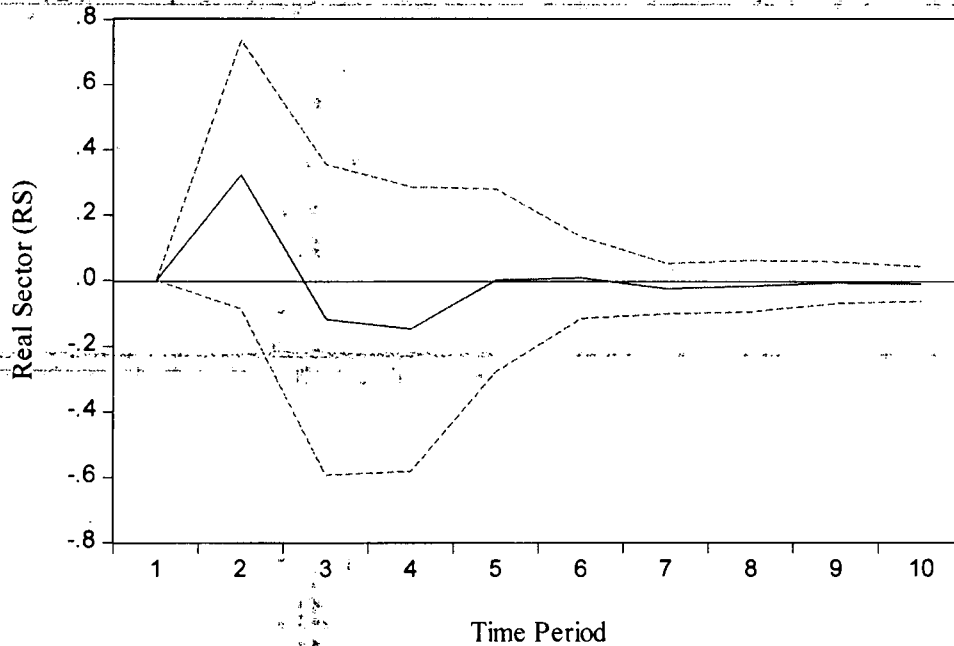
Figure 5.1: Responses of RS to FS Innovation OECD

The graph shows effect of one SD innovation in FS on RS. One can see that the effect of FS innovations on RS is insignificant for all the time periods as the forecast confidence interval for the impulse approaches zero. This implies no significant improvement in RS is expected if there is improvement in FS.

5.2.6 Comparison of Granger Causality, Impulse Response and ARDL

If we compare the results of Granger causality, impulse response and ARDL model, in case of relationship between financial sector and real sector, one can see that the results in the given model are same. As Granger causality results in Table 5.5 shows that financial sector growth does not Granger cause real sector growth in long run. Similarly, result of impulse response also shows that in long time period there is no

[38]

improvement in real sector growth by innovating financial sector on real sector growth. Whereas, the results of ARDL also confirm likewise that FS has insignificant impact on real sector growth.

Granger causality test does not include current values, it takes lags of dependent, independent and control variables and left the current values whereas ARDL model having current values as well as lags of dependent, independent and control variables. Granger causality results shows that past values of financial sector growth does not relate with present values of real sector. Hence, financial sector growth does not have significant impact on real sector growth even after a time interval. Whereas ARDL results show that current values of financial sector also has insignificant impact on current values of real sector growth. Above results clearly depict that influence of financial sector growth on real sector growth is insignificant in long run.

5.3 Relationship between RS and FS Growth: SAARC Countries

The estimation procedure which is adopted for OECD countries, similar procedure applied for estimation of SAARC countries. Redundancy test results for SAARC are reported in Table 5.6, unit root results in Table 5.7, ARDL static long run solution results in Table 5.8 and Granger causality results in Table 5.9.

5.3.1 Redundancy Test

Redundancy test is applied to check the significance of the control variables in the model and unimportant and insignificant variables excluded from the model.

Table 5.6: Wald Test Results

Method: Wald test for restrictions on coefficients		
Dependent Variable: RS		
Variables	**F-Statistics**	**P-Value**
FS	8.091	0.000*
Y	11.707	0.000*
CF	0.888	0.415
HC	0.839	0.436
TO	4.985	0.009*
GS	2.017	0.140
INF	0.230	0.794
*; show significance of variable.		

The results of Wald test of joint significance are reported in Table 5.6, the p-value

for the variables, trade openness (TO) and initial income (Y) are 0.00 which is highly

significant whereas, all the other control variables are found insignificant in the given

model. Therefore we excluded, capital formation (CF) (P-value 0.415), human capital

(HC) (p-value 0.436) government spending (GS) (p-value 0.140) and inflation rate (INF)

(p-value 0.794), for further analysis of SAARC countries.

5.3.2 Panel Unit Root Test

We applied the panel unit root test to check the stationarity of the variables, left for

estimation, after applying Wald test. The results of panel unit root test are given in Table

5.7.

Table 5.7: Unit Root Results

Null Hypothesis: Unit Root(Individual unit root process) Method: Im, Pesaran and Shin W-Stat		
Variables	W-Statistics	P-Value
RS	-4.334	0.000*
FS	-1.831	0.033*
Y	-3.437	0.000*
TO	-4.965	0.000*
*, shows rejection of null (having unit root).		

Results in Table 5.7 shows that all the variables are stationary as their p-value is less than 5%, at I(0) level and null hypothesis of having unit root is rejected against the alternative. Real sector (RS), financial sector (FS), initial income (Y) and trade openness (TO) are stationary at intercept.

5.3.3 Static Long Run Relation between RS and FS Growth

The unrestricted ARDL model is estimated and static long run solution is calculated. The results are reported in Table 5.8.

Table 5.8: Long Run Coefficients Results

Method: ARDL Long Run Coefficients Model Estimation		
Variables	Coefficient	Probability
FS	0.061	0.358
Y	0.636	0.030*
TO	0.115	0.000*
*, shows significance of variable		

In Table 5.8 long run coefficients of model are given. The coefficient of financial sector (FS) is insignificant as p-value is (0.36). It shows that there is statistically insignificant relation between real and financial sector growth in long run and alternatively, the coefficient of FS is very small which shows it is also insignificant economically so that, 1% increase in financial sector only cause 0.06% increase in real sector growth. The coefficient is comparable with the coefficient we had for OECD countries.

The coefficient of initial income (Y) is positive (0.63) and significant statistically and economically. It shows 1% Increase in initial income of the country causes 0.63% increase in real sector growth. It supports the theory of Romer (1986) and Lucas (1988) that initial income positively impacting growth.

Trade openness (TO) is also positively impacting economic growth as the value of trade openness is 0.11 and it is statistically and economically significant whereas, 1% increase in trade openness causes 0.11% increase in real sector growth. It supports the study of Harrison (1996) and Frankel and Romer (1999) that trade openness has significant and positive influence on economic growth. Increase in trade openness cause technological innovation and diffusion of knowledge across countries which lead to long term economic growth and development.

5.3.4 Granger-Causality Test

Now we applied Granger causality test to check whether FS Granger causes RS in case of developing SAARC countries. The results are given in Table 5.9.

[42]

Table 5.9: Granger-Causality Test Results

Method: Granger-Causality/Block Exogeneity Wald Test Dependent Variable: RS		
Variables	**Null Hypothesis**	**P-Value**
FS	FS does not Granger Cause RS	0.081
Y	Y does not Granger Cause RS	0.044*
TO	TO does not Granger Cause RS	0.050*
*, shows rejection of null at 5 percent.		

By applying the Granger causality test, results in Table 5.9 shows that financial sector (FS) growth does not Granger causes real sector (RS) growth, FS has P-value (0.08) which is insignificant. The present results oppose the supply leading hypothesis that financial development leads to economic growth. Initial income (Y) level of the individual having p-value 0.04 and trade openness (TO) have p-value 0.05 which is significant in the given model which shows initial income and openness to trade Granger cause real sector growth.

5.3.5 Impulse Response Function

Impulse response function is applied to see the behavior of FS innovation on RS. In the following Figure 5.2 the behavior of FS impulse on RS is shown.

[43]

Response of RS to Cholesky One S.D. FS Innovation
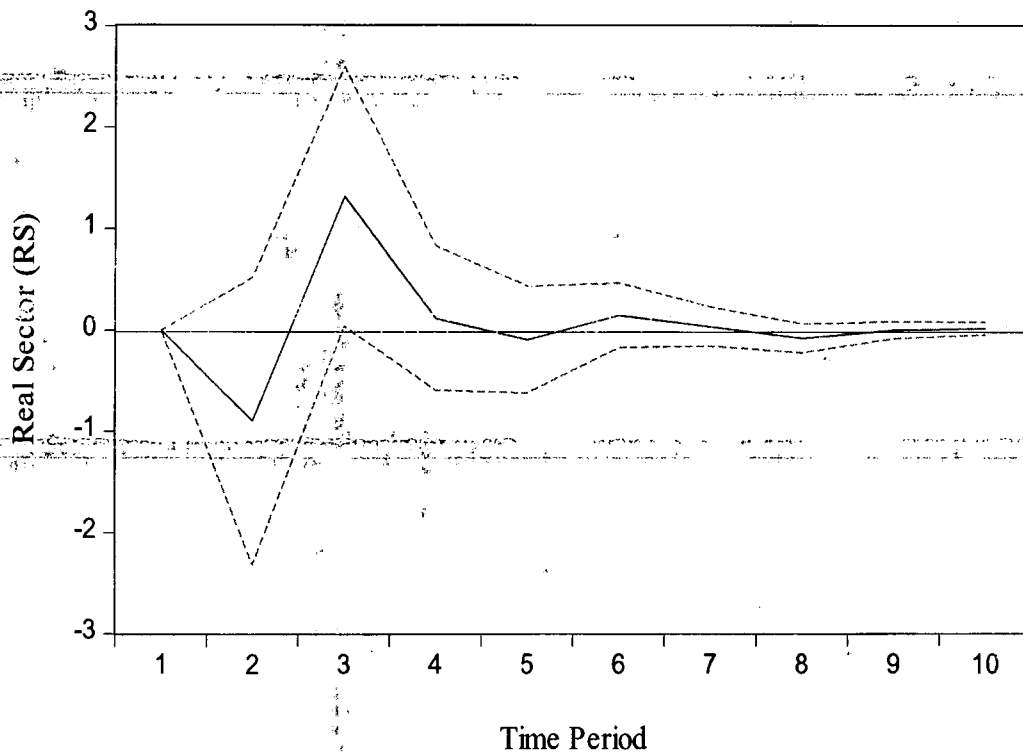
Figure 5.2: Responses of RS to FS Innovation SAARC

The above graph represents effect of one SD innovation in FS on RS. It shows that

the effect of FS innovations on RS is insignificant for a short and long interval of time, as

the forecast confidence interval approaches zero. This shows that no significant

improvement in RS is predictable if there is growth in FS for long time period.

5.3.6 Comparison of Granger Causality, Impulse Response and ARDL

For the given case of SAARC, if we compare the results of Granger causality

impulse response and ARDL, the results are likewise. As in case of Granger causality,

results show that financial sector growth does not Granger causes real sector growth in

long time period. Similarly, the results of ARDL model also shows insignificant impact of FS on RS. However, the results of impulse response also depict the same that the effect of financial sector growth on real sector growth become diminishes for long interval of time as it approaches zero confidence interval. All the results evidently show that the relationship between financial sector growth and real sector growth is insignificant.

5.4 Comparison of OECD and SAARC Countries

If we compare the results of OECD and SAARC countries, one can see that the impact of financial sector on real sector is found insignificant for both OECD and SAARC countries.

Table 5.10: Comparison of Long Run Coefficients Results: OECD and SAARC

Static Long Run Solution	OECD Results		SAARC Results	
Variables	Coefficient	Probability	Coefficient	Probability
FS	0.029	0.168	0.061	0.358
Y	0.138	0.040*	0.636	0.030*
CF	0.112	0.009*	-	-
TO	-0.001	0.617	0.115	0.000*
GS	-0.037	0.379	-	-
INF	-0.117	0.037*	-	-
*, shows significance of variable.				

The coefficient of FS for OECD is insignificant having p-value (0.16). Similarly, SAARC countries also have insignificant coefficient, with p-value (0.35). The results of OECD and SAARC countries, equally showing that impact of financial sector growth on

real sector growth is insignificant. The two coefficients also have approximately same magnitude.

The coefficient of initial income level (Y) is significant for both OECD countries and SAARC countries. Economically initial income level more impacting growth rate of developing countries as value shows 1% increase in initial income causes 0.63% increase in growth of SAARC whereas, it is only impacting 0.14% increase in growth of OECD.

Openness to trade coefficient is positive and insignificant (p-value 0.61) for OECD countries whereas it is positive and significant (p-value 0.00) for SAARC countries. It shows that openness to trade is more beneficial for developing SAARC countries. Trade openness cause 0.11% increase in growth rates of SAARC whereas, no impact on growth rates of OECD. According to Yanikkaya (2003) trade openness facilitates developing countries to get more benefits from advanced countries, which are technologically innovative, and it has significant influence on long run economic growth of developing nations. Results also supporting the Ulasan (2012) that impact of openness is insignificant for OECD while significant for non-OECD countries.

Coefficients of capital formation, government spending and inflation rate are found insignificant for SAARC countries when redundancy test is applied. Therefore, these variables are not included in estimation of SAARC countries.

The results of Granger causality test for comparative analysis of OECD and SAARC countries are reported in Table 5.11.

[46]

Table 5.11: Comparison of Granger-Causality Results: OECD and SAARC

Granger-Causality Test		OECD Countries	SAARC Countries
Variables	Null Hypothesis	P-Value	P-Value
FS	FS does not Granger Cause RS	0.274	0.081

The result of OECD and SAARC countries in Table 5.11 shows that impact of financial sector growth on real sector growth is insignificant. OECD has p-value 0.274 and SAARC has p-value 0.081, which shows that OECD and SAARC countries equally accepting the null that financial sector growth does not Granger cause real sector growth.

The ARDL and Granger causality results for developed OECD countries as well as for developing SAARC countries are found insignificant. It shows that financial sector growth is not beneficial for real sector growth in long run for developed as well as developing countries. Therefore, more emphasis should be given in developing real sector further instead of financial sector, which is overwhelming real sector rapidly now a days.

5.5 Comparison with Previous Studies

The results summarized above differ from previous study, that financial development has positive and significant impact on economic growth. It is obvious that financial sector has insignificant impact on real sector growth. OECD as well as SAARC countries have same results that impact of FS on RS is insignificant. It means that present research negate the hypothesis that FS growth leads to RS growth.

[47]

Study finds an insignificant impact of financial sector growth on real sector growth. This study opposes the supply leading hypothesis by Christopoulos and Tsionas (2004), among others that financial development leads to economic growth. The results are also opposing the King and Levine (1993) hypothesis and his supporters' (Levine & Zervous (1998), Rajan & Zingales (1998), Beck et al. (2000), Al-Malkawi & Abdullah (2011), among others) that financial development has significant and positive impact on economic growth in long time period. The results of the study, supporting the Dawson (2003) in which he found that financial development has insignificant impact on economic growth. The results of the study are also in line with Harrison et al. (1999), Al-Zubi et al. (2006), Liang & Richert (2006), Greis et al. (2009) and Acaravci et al. (2009) that financial sector has insignificant impact on economic growth in long time period.

Contrary to above studies, in this study instead of using proxy variables we used exact indicator of financial sector. We did not include financial sector in real entity (RS growth) as in previous research work whole GDP is used as real sector growth and determined the relationship between two. But GDP is aggregate of real and financial sector. Hence, this research work differs from previous research done by King and Levine (1993) and others.

As coefficient of control variables are considered, according to Mirestean & Tsangarides (2009), in a cross-country growth regression analysis, variation in set of control variables in growth equation changes the significance and also the sign of coefficients. Therefore significance of variables changed in different studies when selected different set of control variables. Even at times the same author found dissimilar

[48]

conclusion in studies from different years or when their set of control variables changes. Therefore, contradictory results of control variables are possible in panel data.

Initial income level is found positive and significant for impacting real sector growth in case of developed OECD countries and developing SAARC countries, which is contrary to convergence theory. While, positive coefficient supports the theory of Romer (1986) and Lucas (1988), that initial income positively impacting to stimulate growth. When income level raises it cause increase in investment and stock of capital of a country and technological innovation which leads to more economic growth. On contrary, according to Neo-Classical growth model, (Solow (1956), Swan (1956), and Koopmans (1965)), high income increase the stock of capital in the country which causes diminishing return in reproducible factors and economy grow at slow rate. So, high income (initial income) negatively associated with economic growth.

Coefficient of government spending is found insignificant in the current model. According to Neo-Classical model of growth by Solow (1956) and Swan (1956), the government expenditures does not directly influence long run growth rate, generally it has only transitional growth effects. The government expenditures only determine the level of output rather than growth rate. Different economists have their opinion that fiscal policy has many components. On aggregate the impact of government expenditures are inconclusive. Government expenditures are consisting of productive expenditures and unproductive expenditures. Productive expenditures have direct influence on growth whereas unproductive expenditures have no effect on economic growth (see Barro and Sala-i-Martin (1992)). Many studies show that government expenditures do not influence growth rates (Kneller et al. (1999), Bleaney et al. (2001) and Agell et al. (2006) among

[49]

others). On contrary, large number of studies is in support of negative influence of government spending on economic growth. Vedder and Gallaway (1998), assert that government consumption crowds out investment in private sector and also decline capital formation in long run. Increase in government spending cause deficit which is financed by borrowing and more borrowing increase interest rates and decline in private investment. If government expenditure grows continuously law of diminishing return begins to operate and after some time, further increase in it cause decline in growth. Barro (1995), Chen and Lee (2005) among others are also in favor of negative influence of government spending on economic growth.

Inflation rate has negative and significant impact on real sector growth. The present result supports the studies of De Gregorio (1993), Levine & Zervous (1993), Boyd et al. (1996), among others. According to them, high inflation shows macroeconomic instability and price distortion. As prices increases it also cause increase in cost of production and investment reduces and impacts negatively on growth. This is contrast with the Phillips curve theory, which assumes that there should be positive association between inflation and GDP growth.

Coefficient of capital formation shows positive and significant impact on real sector growth in present study, which shows more capital leads to economic growth. Present result supports the studies of Beddies (1999) and Ghura (1997), among others. Recent growth model developed by Lucas (1988) and Romer (1986) foresee that increase in capital formation cause everlasting impact on economic growth. Capital is considered as growth enhancing element. Capital formation measures the production capacity of a country and affects economic growth positively. More capital investment increase

[50]

productivity and industrial development in the economy and thus leads to economic growth.

Coefficient of trade openness is positive and significant in the present study for the case of SAARC countries and insignificant for OECD countries. By following endogenous growth theory, most of economists have their consensus regarding positive relationship between trade openness and economic growth. One most accepted channel of trade and growth relationship is innovation based growth literature or research and development (R & D) spillover effects. Economic growth is increased by (R & D) activities. These research and development (R & D) activities, in developed countries spillover their effects in developing countries. Trade provides international access of technological knowledge across countries which cause innovation and introduction of new products varieties. Thus trade has important affect on growth through knowledge transformation across borders. (Grossman and Helpman (1991), Batiz and Romer (1991), among others). Harrison, (1996) and Frankel and Romer (1999) also assert that trade openness increases technology and diffusion of knowledge across countries and stimulating growth. According to Yanikkaya (2003), in the light of endogenous growth theory, developing countries get more benefits from advanced countries, which are technologically innovative, and it has significant impact on long run economic growth. Thus trade openness is more beneficial for developing nations. However, this is investigated by Ulasan (2012) and found empirically strong support to this view by getting small and insignificant coefficient for OECD relative to significant coefficient for non-OECD countries.

Chapter 6

Conclusion and Policy Implications

6.1 Conclusion

In this research work the relationship between real and financial sector growth is estimated for OECD and SAARC countries. Data are collected from 1994-2013 for OECD and 2000-2013 for SAARC countries. By applying the Granger causality test we determine the causal relationship between real sector growth and financial sector growth. The results of the study show that financial sector growth does not Granger cause real sector growth. The present study does not support the supply leading hypothesis by Christopoulos and Tsionas (2004), among others, that financial development promoting economic growth in long run. The long run ARDL model estimation of the study also shows insignificant relationship between financial sector growth and real sector growth. Hence, this study opposing the study of King and Levine (1993) and his followers' Levine & Zervous (1998), Beck et al. (2000), Almalkawi & Abdullah (2011), among others, that impact of financial sector on real sector is positive and significant. Present study is in support of Harrison et al. (1999), Dawson (2003), Liang and Richert (2006), and Greis et al. (2009), among others that impact of financial sector on real sector is insignificant.

The present study differs from previous study in two respects. First, in this study we used an accurate measure of financial sector (dollar value) for measuring financial development instead of using proxy variables which usually used in previous study. Second, the previous study tries to find relationship between FS and GDP which is not

[52]

appropriate because FS is a component of GDP, and positive association between two is almost sure. Therefore, in this research work we did not take GDP as real sector growth. We take GDP minus FS as real sector growth and determine the relationship between RS and FS growth.

The results of ARDL as well as Granger causality show that relationship between two sectors is insignificant for the case of OECD and SAARC countries. The findings implies that the growth rates of RS and FS are not moving together which leads to increased income inequality and financial bubbles which hit the economy badly. Hence, the present study justify that improvement in financial sector does not improve real sector growth. More emphasis on financial sector instead of real sector is not beneficial for both developed and developing countries. Equal importance should be given towards financial sector as well as real sector.

6.2 Policy implications

This research shows that financial sector growth does not have significant impact on real sector growth. Productivity in real sector is very important; as real sector is the main component on which economy depend. As far as investment is considered, more financial sector investment cause diversion of resources from real sector towards financial sector, which is not always productive for the economy. If investment in financial sector exceed than investment in real sector it may cause negative impact on the economy, sometimes it can also be the reason of financial crisis as pointed out by Kaminskey & Reinhart (2003), Gennaioli et al. (2010), among others. According to Pakistan labor force survey 2012-2013, the employment in financial sector is only 1.16% of total employment in Pakistan, which shows that real sector providing employment to

[53]

99% of the labor. Thus a huge growth in financial sector only implies increase in the income of 1% of the population. This is likely to increase inequality in the country. Similarly, OECD statistics of labor force survey 2012-2013, shows employment of financial sector of OECD countries range lies in between 2% to 4% which is very less as compare to real sector employment, whose range lies in between 96% to 98% (see detail in appendix). It is not being justified through our research work that policy makers should focus further on financial development to stimulate growth in real sector. Following are the policy implications of the study.

> Being the signatory of millennium development goals declaration, Pakistan has to reduce income inequality. However, the two sectors of economy if, do not grow parallels this will increase income inequality instead of reducing it.

> There is need to focus on the sector having impact on lives of masses instead of few people, for the country like Pakistan, where the market of job seeker is going to expand very rapidly, there is need to focus on the sector creating large number of employment opportunity.

> Policy makers should focus on balanced growth of financial as well as real sector of the economy. If the two sectors do not have similar growth, this will lead to greater income inequality.

> Developed as well as developing countries, should focus on the policy which has encouraging impact on real sector growth instead of financial sector growth.

> There is need to measure financial development in its accurate term (dollar value) instead of using proxy worldwide to determine the relationship between real sector and financial sector.

- In the analysis of impacts of financial sector on the real sector, there is need to calculate RS explicitly by subtracting FS from GDP. Using aggregate GDP as measure of RS is problematic as FS is already a part of it.
- There is need to specify that how much financial sector is important for the economy, and how much part of investment should be allocated in financial sector.
- It is also required to spread awareness among the people regarding investment in productive sectors of the economy, instead of non productive sectors.

6.3 Research Limitations

Our research work is limited for the case of 20 developed OECD countries and 7 developing SAARC countries. Time span of data of SAARC countries are only 14 years which is not enough for long run analysis. Developing countries data are not available for long time period. Therefore, this research is limited only for developing SAARC countries.

6.4 Direction for Future Research

There is more research needed to explore the relationship between financial sector and other macroeconomic indicators of the economy like inequality, poverty, employment level, inflation rate and long term development of the economy.

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Appendix

In Table A.1 detailed description of percentage of employment rate of real and financial sector of OECD is given.

Table A.1: Employment Percentage of Real and Financial Sector OECD

Percentage of employment in year 2012-2013: OECD		
Countries	**Financial Sector**	**Real Sector**
Australia	3.69	96.31
Austria	3.52	96.48
Belgium	3.49	96.51
Czech Republic	2.79	97.21
Denmark	2.90	97.10
Finland	2.00	98.00
France	3.47	96.53
Germany	3.22	96.78
Hungary	2.48	97.52
Italy	2.84	97.16
Japan	3.02	96.98
Korea	3.44	96.56
Luxembourg	11.22	88.78
Netherland	3.28	96.72
New-Zealand	3.13	96.87
Poland	2.43	97.57
Spain	2.66	97.34
Sweden	2.05	97.95
Switzerland	5.47	94.53
United Kingdom	3.87	96.13
Calculated by using data of labor force survey: Employment by activities given in OECD Statistics.		

List of OECD Countries

1. Australia	11. Japan
2. Austria	12. Korea
3. Belgium	13. Luxembourg
4. Czech Republic	14. Netherland
5. Denmark	15. New-Zealand
6. Finland	16. Poland
7. France	17. Spain
8. Germany	18. Sweden
9. Hungary	19. Switzerland
10. Italy	20. United Kingdom

List of SAARC Countries

1. Bangladesh	5. Nepal
2. Bhutan	6. Pakistan
3. India	7. Srilanka
4. Maldives	