Effect of Financial Development on Real Economic Growth: Application of WALS Approach

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2019

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CERTIFICATE

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Acknowledgment

All praises to **ALLAH** (SWT) Almighty, the most Gracious and the most Merciful and his Prophet Muhammad (*Peace be upon him*) whose blessings enabled me to pursue this research. I consider it a great honor and privilege to record my immense gratitude and appreciation to respected research supervisor **Dr. Atiq-ur-rehman**, Associate Professor of Econometrics and Statistics at PIDE, whose continuous guidance, feedback, advice, and encouragements have been truly exceptional. I have learned new techniques to solve research problems throughout this process. I would appreciate **Dr. Amna Urooj,** Head of Department and respected all teachers that incredible dedication towards the department of econometrics and statistics ensures the students to work in a friendly, cooperative, and highly professional environment. Specially **Dr. Asad Zaman, Dr. Hafsa Hina, Dr. Saud Ahmad, Mam Uzma Zia and Mam Nadia Hassan** they guided and taught me during the course work and as well as throughout my research work and always tried to bridge the linkage between the students and the professionals of the fields. I found them very cooperative, kind, and enthusiastic about new research ideas.

There always are some special friends like brothers or colleagues on which rely upon in every situation you face. Those special friends and colleagues in my case are **Hamid Ali**, **Alamzeb, Atiq-ur-rehman, Khair-bux, M. Raza, Shahzad iqbal, Shahbaz gul, and Kashif.** They were always there for any sort of help and assistance during my research work. Further, there are some special persons who contribute a lot to my life during the study. Those all are like family persons for me, they give a lot of love, care and support to fulfill my study. it was their help during exam days that enabled me to pass my exams in good numbers. Not only limited to that, but they encouraged and boosted me at times when I felt down regarding my research work. They injected believe and faith in me through their motivational skills which encouraged me to reach this level. It is an honor for me to study at **Pakistan Institute of Development**

Economics Islamabad (PIDE), which truly is a world-class research institute. The staff at PIDE is very cooperative, especially I would like to mention **Mr. Muhammad Yasir**, who is truly a humble man and helped in academic matters. Moreover, I especially tribute to my parents, who sacrificed everything to make me a well literate person. Their love care and sacrifice have been the beacon of light throughout my life.

IMAD ALI

2016PIDEFMPHILETS11

Dedication

This work
is dedicated to my
beloved parents
and
My brother
Aasim Ali.

Abstract

A number of studies have investigated the relationship between financial sector development and economic growth (GDP). The economists have a disagreement regarding the relationship between the financial sector and economic growth (GDP). The majority of economists think that the relationship between the financial sector and economic growth is positively associated. However, there are some other economists who argued that the relationship between the two is negative or either independent. One view is that financial sector growth is faster than the real sector growth that leads to increased wealth and ultimately to increased inequality. However, there, are some researchers who argued that the financial boom has been observed before all major financial crises. Therefore, it is important to investigate the relationship between the financial sector and the real sector. This study tries to explore this relationship for six countries that includes Pakistan, India, Srilanka, China, Japan, and Malaysia. The data from 2000-2017 has been utilized and Weighted Average Least Square and cointegration to check the long-run relationship between the two-sector. Our results showed that there is no significant relationship between the financial sector and the real sector. This implies that there is no co-movement between the two sectors of the Gross Domestic Product. We may conclude that countries should focus more on real sector development as compared to the financial sector.

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Chapter 1

Introduction

1.1 Introduction

Over a period of time, a Large number of studies have investigated the relationship between financial sector development and economic growth. The economists have a disagreement regarding the relationship between the financial sector and the real sector. According to several researchers, financial sector plays an important role in economic growth of a country. Bagehot (1873) and Hicks (1969) examined that the financial sector played a sensitive role in enhancing industrialization. Levine (2005) argues that the financial sector may influence savings and investment decisions and which finally affect the gross domestic product of a country (Abdullah & Almalkawi, 2011; Beck, & Levine, 2002; King & Levine 1993). However, on the opposing side, some researchers also claimed about financial sector development had a destructive effect on the growth of the economy (Ductor & Grechyna, 2013) (Samargandi et al., 2013). Some people 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. Therefore, no consensus among the economist regarding the relationship between financial development and economic growth.

The reason behind this is that empirically there are serious flaws in the relationship between both sector financial sector and economic growth. Many studies have used economic growth as a core variable while for independent variables they used any proxy of the financial sector. Though, we know that the financial sector is also part of GDP. It is almost sure that the relationship will be positive between these two. As the gross domestic product (GDP) is a combination of different components like the agriculture sector, manufacturing sector, and services sector. The services

sector is further composition of financial services and other services; thus financial services are a part of GDP. We can easily say that GDP is the combination of the agriculture sector, manufacturing sector, financial services, and other services. When the financial sector is excluded from it, it becomes real sector growth. In other words, GDP is equal to Real sector plus the financial sector.

As financial services are a part of GDP which implies a positive relationship between both sectors, that increases the financial sector and brings development in growth. This implies that the relationship between financial sector and real sector is trivial and does not need any proof. Despite this, the researchers did a lot of effort to prove the relationship between financial development and economic growth (Levine, 1993; Beck, & Levine, 2002; Almalkawi & Abdullah ,2011;) argues that the positive relationship between growth and the financial sector is almost sure. There arises a question of whether financial growth improves in real growth or not. The financial sector was typically capital intensive and creates little jobs as compared to the real sector of the economy. The real sector is labor-intensive and creates more jobs that contribute significantly to inclusive development. It also includes human development in emerging economies. GDP, other than the financial sector is termed as a real sector (Subtracting financial sector from GDP). The question needs to be investigated is, whether financial sector development affects real sector growth or not. Surprisingly, most of the current works have ignored this issue. Various theories exist, which predict the relationship between the real and financial sectors. These theories often contradict each other in terms of significant relationships. First, the financial sector can directly affect the real sector because the financial sector facilitates investment (King & Levine, 1993). Second, the financial sector inversely affects the real sector because allocation in the financial sector leaves little room for the real sector (Ductor & Grechyna, 2013). Therefore, the financial sector could

either increase or decrease the Real sector. So it is imperative to find the relation between Real and Financial sectors. Without separating the Real sector from the financial sector in GDP, analyzing the impact of finance on growth would give us trivial results which would lead to inadvertent policy suggestions.

Consequently, this study intends to explore the relationship between financial sector development and real sector development. This will solve a query about whether financial development promotes or demotes real sector development. Causality could reverse as the Real sector activity goes up, and it may affect the financial sector too.

The possible directions of causality between financial development and growth are labeled by Patrick (1966) through "*supply-leading hypothesis and demand following hypothesis"*. According to the supply-leading hypothesis, causality runs from financial development to real sector growth, which means that the inception of financial institutions and markets enhance the supply of financial services, thus leads to real sector growth. On the other side, the demand-following hypothesis posits a causal relationship from economic growth to financial development. Here, the growing demand for financial services might broaden the horizon of the financial sector as the real economy grows (Gurley & Shaw, 1967; Goldsmith, 1969; Jung, 1986;). Many researchers use a proxy for the financial sector but now values of the financial sector are available for many countries, this value can be replaced with its proxy to get a better idea. In the previous studies, various methodologies have been applied to know the relationship between the financial sector and the real sector. Among those, some methodologies have the problem of dimensionality. In this study, we intend to apply a weighted average least square technique (WALS) to solve the problems and to lift the curse from the problem of dimensionality. In this study, we will use new financial data.

1.2 Objectives of the Study

The objectives of this research are as follow:

1) To investigate the impact of financial sector development on real sector growth.
2) To analyze whether there exists long-run relationship between the financial sector and real sector growth.

1.3 Significances of the Study

Numerous studies have measured economic growth by looking at GDP growth, but as we know, the financial sector is already there. The financial sector typically has several loans in different ways. It invests in unproductive activities similar to those in the banking sector or the stock market. This has virtually no or little impact on real economic activity. Many economists find the relationship between the financial development of both sectors and economic growth, but the way they solve these problems makes no sense. GDP has a financial history that should automatically lead to GDP growth and it does not require research. The important question, however, is that, whether or not the growth of the financial sector leads to the growth of the real sector, there is no satisfactory answer to this question.

It is well documented in the economics literature that financial sector significantly contributes to GPD growth. However, the impact of financial sector on real sector have less explored. In addition, several studies have used proxies like stock market, banking sector and others to investigated the relationship between the two sectors. In this study we have used the exact value (dollar value) of financial sector.

1.4 Organization of the Study

The organization of the study is designed as: The first chapter of the study has explained the introduction, importance of the study and objective. The second chapter deeply studies the theoretical background and the link of economic growth with financial development. While in the third chapter we discuss the empirical work of past research. Chapter Four discusses methodology and data description. Chapter five contains results which were detailed discussed and also compared to the existing literature. Conclusion of our research and policy related to the study were mention in the Sixth Chapter.

Chapter 2

Theoretical Literature

2.1 Background

This section will review the conceptual work on the relationship between financial development and economic growth. The issue of the causal relationship between financial development and economic growth of a nation has been subject to extensive debates. However, in general, consensus although financial development plays a pivotal role in economic growth. The positive role played by financial development in economic growth is also questionable, as many of researcher has proved the positive relationship between financial sector development and growth. While this relationship is trivial and does not need any proof but still the researchers have put a lot of effort to prove this relationship. In this study, our focus is not to investigate the connection between the financial sector and economic growth, but to find the causal relationship between the financial sector and the real sector which is mostly ignored by researchers. These possible directions of causality between financial development and growth are labeled by Patrick (1966) through *supply-leading and demand following hypothesis*. While Robinson (1952) argues that enterprise leads finance which is also called demand following hypotheses. Patrick (1966), Demetriades, & Hussein (1996), Luintel et al., (1999) will Robert Lucas (Nobel Laureate in economics) in 1988, argues that financial development and economic growth are not causally related which mean they have no relationship between Financial sector and real sector. So, the theoretical literature shows four streams of the financial sector and the real sector according to their nature of the relationship.

Which are as follows:

- Supply leading Hypothesis
- Demand Following Hypothesis
- Bi-directional
- No Relationship

Many economists are in favor of their own hypothesis and they also support it in different ways. The four descriptions are detailed discuses are as under.

2.2 Supply Leading Hypothesis

The subject to financial development and the growth was initially discussed by Schumpeter (1912), in which he showed, how finance is essential for growth as well in the development of a particular economy. He argued that the banks which were well-functioning boosted up technological invocation which turned to generate growth. The analysis of Schumpeter depends on the idea of credit in hand of entrepreneurs which leads to the development of an economy.

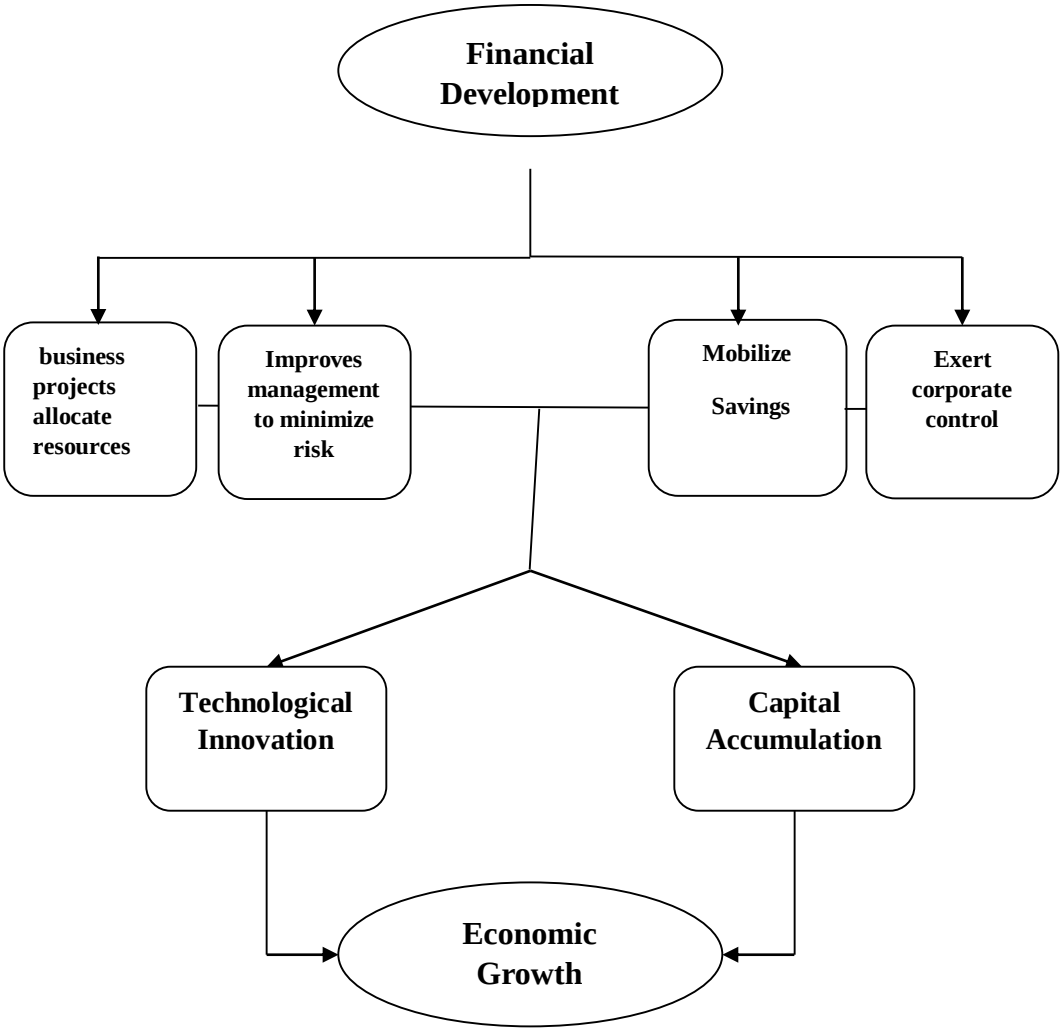
Two of the main developers the financial repressionists, Shaw (1973) and McKinnon (1973), advocate “financial liberalization” by emphasizing the importance of financial integration.

Thought related to this school argued that, integration of the financial system is a crucial step in improving financial development and economic growth. The government should not any control over interest rates. Free interest rates would increase and promote financial development and financial deepening through an increase in different types of savings which would be transferred to productive activities which in turn would translate into higher levels of economic growth.

The followers of the supply-side leading hypothesis state that financial sector development leads to real sector growth. Financial sector makes it an appropriate approach for investment funds that

eventually boost the supply services and manufacturing of economic goods and services in the economy. The various path has been discussed in the literature that support the hypothesis, like more finance in development side required proper allocation of resources which helps for different projects in business. Through improvement in the management side by minimizing the risk and mobilize saving is also required. Further facilitates like exchange and transaction may exert in corporate control leading to more capital accumulation and technological innovation, thereby increasing the growth of the economy rapidly.

Figure 1: Supply Leading Channel

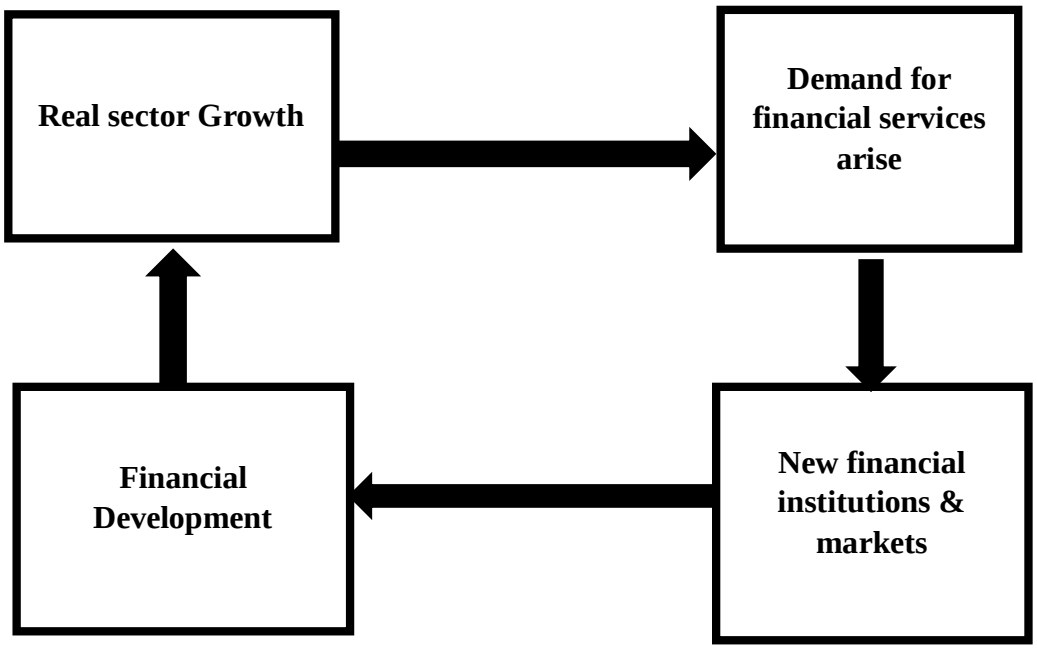


Building upon the diagram represented in Figure a, financial sector development has a significant role and also plays a key role in increased capital accumulation as well as in technological change which leads to rapid economic growth.

2.3 Demand Following Hypotheses

According to demand following hypothesis, development in real sector growth brings development in the financial sector through, "growth-led finance". Robinson (1952) emphasis that the demand channel was followed by some enterprise which may lead to real growth. The improvement in the economy of the country is required to bring demand for fresh financial instruments, and thus the financial sector is responding well to this demand.

Figure 2: Demand Channel



If an economy lacks improvement in financial sector, it causes less demand for financial services. As for more financial services required to improve on the real side of the economy. Through an increase in real side of the economy and satisfy the increased demand for financial services results new institutions were emerging and new markets were arising. The channel was also shown in the diagram as well in which real growth encouraged financial growth. Many researchers are in favor of this hypothesis, e.g. Liang and Raychert (2006), Harrison et al., (1999), Ireland (1994) and Goldsmith (1969).

2.4 Feedback Causality Hypothesis

The next one in the line called **Bidirectional** or another name is **Feedback.** In light of this hypothesis, interconnection runs from both financial developments to economic growth and vice versa.

It means that is there is a two-way causality between financial development and economic growth.

Therefore, a well establishes financial sector will enhance economic growth with the help of technological advancement and innovative ideas which introduced new products and different services. Which eventually increases the demand for financial services (Majid et al 2007).

Various theories and empirical studies supported the demand-side hypothesis like (Patrick 1966; Demetriades, & Hussein 1996; Luintel et al., 1999; Greenwood, & Smith, 1997; Al-Yousif, 2002; Calderón et al., 2003; and Aurangzeb, 2012).

2.5 No Relationship

The last and final hypothesis,

Nobel Laureate Robert Lucas (1988) which also proposed that the financial sector has no relation to economic growth. According to Tobin (1984) highly increase in financial development crush the productive potentials of the economy. This view suggests that financial development and economic growth have no causal relation. Lucas (1988) argues that economists deeply emphases that the financial sector has a significant role in economic growth.

Nicholas et al (1989) somehow do not overview stress the role of finance in the economic growth process. Stern (1989) conclude that financial development has a negative impact on the economic growth resembled by the finding of Kindleberger (1978) and Grabel (1995). Ayadi et. al., (2015) also used several variables from the time period 1985-2009.which show inverse relation of credit to the private sector and bank deposit Later its toward growth. Singh (1997), found a weak relationship.

Chapter 3

Empirical Literature

According to the literature review, the empirical review is also separated into four different parts. The first part is including the studies in favor of the hypothesis about supply-side leading. The second part of the study concern the Demand-side following hypothesis. A bi-direction relationship is the third part while the studies show no significant relation of economic growth and financial development which are discussed in the fourth part. It is further discussing as under:

3.1 Supply Leading Relationship between Real Economic growth & Financial Development

As supply leading hypothesis supported empirically done by many economists. Which shows both significant and insignificant effect of the development in the financial aspect of real growth in the economy. So, the supply leading hypothesis is further divided into two parts. Positive association of financial development on real growth and some propose inverse association of the financial sector and real economic growth according to different studies.

3.1.1 Financial Development have Positive effect on Real Economic Growth

Empirically work financial development and real economic growth are explained in different ways in the current literature. Some of the researcher's emphasis on financial indicators is bank-based, while others think about Market-based indicators of financial development. Some researchers used both bank-based as well as market-based indicators for the financial part used as a proxy of it.

Levine (1993) started an empirical investigation. Levine & King (1993) from the periods of 1960-89 take the data of 80 developing and developed countries. while the results show a positive

relationship between economic growth and financial growth. Banking credit, liquid liabilities, and commercial central bank assets are used as a proxy variable for financial development which shows highly positive relationships with more economic growth. They suggest that financial development plays a vital role in the long term for the attainment of growth.

Levine & Zervous (1998) also investigate by taking the data of 47 courtiers from the time period 1976 to 1993. Output Growth, Productivity Growth, Capital Output Stock and saving are taken as a proxy of development on the financial side of the economy. The results show that the financial market plays an essential service to growth. Demirguc-kunt et al. (2001), used the different proxy variables like market-based and bank-based to find the relation. The results found a significant relationship between both. Beck & Levine (2002), take the 40 countries sample from the time duration 1976-1998. They used Generalized methods of movement methodology. They explore that market-based and bank-based financial indicators are positively connected to economic growth. Many researchers more investigate Many of them found the same outcomes which were found by Levine (1993) that financial development has a progressive impact on economic development. While in recent research which was done by Mbarek, and Rachdi (2011), Aalkawi and Abdullah, (2011), and Apergis et al., (2007), also found a significant association between financial progression & economic upraised. According to Greenwood & Jovanovic (1990), the financial sector is most essential for a well-organized allocation of resources and risk for diversification. In the return estimated returns can be seen to have higher values (Gurley et al., 1955; and Obstfeld, 1994). Rajan & Zingales (1998), Demirguc-Kunt & Levine (2001), and Beck & Levine (2004) work show the results have similarities as originally perceived by Levine.

Rioja and Valev (2004) study a panel of seventy-four countries between the time span of 1960 to 1995 and used “generalized method of moments” methodology and they divided the data into three

different regions. As he used high and low-income courtiers in both types for countries show a significant impact on Financial development and growth.

Khan & Senhadji (2000) used the private sector, that market capitalization of equity market & bond market as a substitute proxy variable for financial development and found a positive relationship between financial development and economic growth. But have different results while using the different proxy variables.

In the new fresh study by Ayadi, et al. (2015), form the time dated 1985-2009 used numerous variables, on area called the Mediterranean also determined similar, that indicator of share market has same direction movements with economic growth while on other hand credit released to private sector and deposits in banks are adversely linked to economic growth.

The financial sector is quite helpful in providing insurance for all the available risks by the process of diversifying the uncertain hazard that exists both on the individual level and firm level. It also has an active part in mobilizing savings of individuals which leads to high return (Acemoglu et al., 1997). Mobilizing of individual savings cause more participation by investors and enhance capital which is required and needs to be accumulated as well as innovation and introduction of new technology, and thus, long term economic prosperity.

Similarly, financial intermediaries manage corporate governance in a better way which causes the firms to perform more efficiently and appropriately in returns oriented environment. Furthermore, they reduce costs related to monitoring and controlling which results in increased productivity and economic development (Bencivenga, & Smith 1993). When lenders and equity holders monitor firms from time to time through corporate governance, the firms tend to allocate resources more efficiently & reduce uncertainty and mismanagement of capital which increases the productive nature of the firms and leads to the growth of the economy as a whole.

3.1.2 Financial Development have a Negative Impact on Economic Growth

The negative impact of financial development on economic growth is also supported by empirical literature. Sometime negative impact may lead to a financial crisis. In recent work of Favara (2003) used the data of 85 countries from the time period of 1960-98 and applying OLS and Generalized method of movement (GMM) panel estimators, while for financial development used a proxy of liquid liabilities. The results show a negative relationship between financial advancement and economic growth. Likewise, Loayza & ranciere (2002) were also supporting the view that financial development & economic growth is negatively connected. They concluded the result after using the sample of 74 countries from the time period in 1960-95. The major cause of the bad impact is the credit boom. Similarly, Haiss et al. (2011) also examine the relationship of financial development by merging it in financial crisis and take the sum of credit, bond market and secondary market of shares as a proxy indicator of the financial segment while for dummy variables they used financial crisis. The results of their work show a negative impact on financial development and economic growth. it's also confirmed by Rousseasu and wachtel (2005) by using the sample of 1960-2004 by applying a generalized method of movement panel technique for 84 counties. The results show that extreme financial deepening and increase credit growth cause a financial crisis. Dufrenot et al., (2007) used PANIC and Co-Integration Methodology for the sample of 89 countries from the time duration of 1980-2006. For the financial sector, they used four Proxy variables which have a negative impact on developing countries while positive impacts on the developed countries. Samargandi et al., (2013) also found the negative relationship between financial development and economic growth while taking the data of underdeveloped regions. Ductor & Grechyna (2013) used the statistics of highly developed realms & the results show that

financial development has a negative impact on economic growth. While for lower-income countries and underdeveloped nations also showed a negative impact on financial development.

3.2 Demand Following relationship between Financial development & economic growth

While disagreeing with the supply hypothesis, demand following are also supported empirically through different studies. This means that an increase in economic growth has a positive and significant relation if an increase in financial development.

The studies of Jung (1986) also establish uni-directional causality for developed nations and for their developing counterparts, he supports supply leading hypothesis. The methodology he used vector auto-regressor (VAR) approach of 56 developing and developed counties.

In the same way, Harrison et al., (1999) also favored the concept of demand following. He suggests that more economic growth endorse profitability and also increase the activities of banking in the financial sector. Which promotes the entrance of new banks in the country?

Present research work done by Zang & Kim (2007) used the figures of East Asian countries by applying the panel estimation technique found strong evidence of demand following hypothesis. He proposes that no proof of the hypothesis relating to the supply-leading process exists.

By applying Granger causality Liang and Richert (2006) also found the same results as Harrison. The results show that economic growth leads to financial development. Ozturl (2008) use the data of Turkey and also found one-way causality for financial development and economic growth.

3.3 Bi-Directional Relationship between Financial Development:

Bi-directional causality between financial development and economic growth was also supported in some empirical research. Financial development contributes to the growth & then moves back to economic progression in the result points to financial sector improvement. Luintel & Khan (1999) viewed interlink in the long term and bi-directional causal relationship between economic growth and progress in the financial side of the economic condition at regions in the Asian continent by using the VAR context. In the research work done by Chuah & Thai (2004) by applying ECM and VAR models to find a causal relationship between financial development and Economic growth and also found bi-directional causality for 6 of the Gulf Cooperation Council (GCC) countries. Their conclusion as perceived states that financial reforms are required for the upbringing of the real sector. Apergis, et al. (2007) had similar work by mentioning panel cointegration tool for predicting any sort of relation between financial progress & economic advancement for fifteen OECD nations and fifty non-OECD realms and found long-run relationship sustained between financial development & economic growth and also showed bi-directional causality. Akinlo et al., (2010) studied and revealed the connection between a sophisticated financial side and a gradual increase in the economy by applying the vector error correction method in ten sub-Saharan countries. The results show that long-run relation has existed and financial development is cointegrated with economic growth. But, some countries like Kenya, Chad, South Africa, Sierra Leone, and Swaziland show bi-directional relations. Acaravci et al., (2009) used panel co-integration and panel generalized methods of movement to checked the causality between financial development and economic growth for sub-Saharan African countries from the time 1975 to 2005. Their results show a bi-direction causal relationship. They don't have any long-run relationship between financial development and economic growth.

Aqil khan et al., (2018) also used two model and for each model they take different proxy in case of Pakistan from the time period 1973-2015. They find that causality may vary by using different proxy for the relationship of financial and economic growth.

3.4 Financial development has an insignificant impact on Economic Growth

This view suggests that there is no important relationship between financial development and economic growth. Lucas (1988) argues that economists badly overstress the role of financial factors in economic growth. Nicholas et al (1989) do not overview the role of finance in the economic growth process. Stern (1989) also found an insignificant impact of financial development on economic growth which was supported by Kindleberger (1978) and Grabel (1995). Ayadi et. al., (2015) also used several variables from the time period 1985-2009.which show inverse relation of credit to the private sector and bank deposit Later its toward growth. Singh (1997), found a weak relationship. Later Narayan and Narayan (2013) examine the relationship between financial development and the economic growth of 65 developing countries have also negative relations. Ductor and Grechyna (2015) used the data from 1970-2010 of 101 developed and developing countries. Grassa and Gazdar (2014) in five GCC countries d Which also show negative relation. Research work is done by (Ram in 1999, DeGregorio & Guidotti in 1995 and Gries et al. in 2009) also found no relation. Lucas (1988) suggests that there isn't any relationship between financial development and real economic growth. Acaravci et al., (2009), Al-Zubi, et al. (2006), and Dawson (2003), also establish that the relationship between financial developments on real economic growth is insignificant.

3.5 Literature Gap

All the studies mentioned above-used proxy variables for measuring financial development. But now dollar value is available. Secondly, the question is ill-posed that the financial sector is a part of GDP, so the question arises here financial sector versus real sector and no one has answered this question. Thirdly, People working in growth economics used a limited number of variables which lead to biased results. We take a very large number of variables and will use sophisticates WALS approach.

Chapter 4

Methodology and Data Description

The detail on methodology which we follow and Data description are discus in this chapter. In methodology, we apply WALS to find the relationship between the Real sector and other focused variables. For achieving the second objective which is to check the long-run relation we apply the cointegration test. While in data description sources are given from where the data are collected.

4.1 General Concept of WALS Method

Magnus and Durbin (1999) introduced the modeling averaging technique for the first time later, Danilov also helps with Magnus (2004), (2016) to make further improvement. The technique is called "WALS (weighted average Least Square)".

The statistical framework in linear regression:

$$Yt = \alpha + X_1\beta_1 + X_2\beta_2 + e \quad \ldots (1)$$

Here, the focus variable is shown as X_1 so we fixed X_1as a core variable. The purpose of fixing focus on X_1 because it contains the explanatory term in which we are interested in the model.

Whereas, the helping variable is the subset of X_2 and which are also less certain. Now X_1 is fixed but the auxiliary variables X_2, which will change an each and every regression model will estimate of β_1 andβ_2. Danilov and Magnus (2004) also used the same methodology, so the columns of k_1 in X_1 are focus term of regressors and the auxiliary regressors are in columns of k_2 in X_2 .

The focus parameter $\hat{\beta}_1$ is the main interest to estimate of which meant the calculate coefficients of core variables with the help subset X_2.

The computational steps are specified as under:

In general, let us start from a simple linear model:

$$Yt = X\beta + \epsilon_t$$

Or

$$Yt = X_{1i}\beta_{1i} + X_{2j}\beta_{j2} + \varepsilon \qquad \varepsilon \sim iid\ N(0, \sigma^2) \quad \ldots (2)$$

Where y is $n \times 1$ observations vector.

X_1 (n x k_1), X_2 (n x k_1) are the matrices of observation which are involved in the subset of auxiliary terms.

ϵ_t represent the error term.

Now in the given methodology here assuming that:

$$k_1 \geq 1$$

$$k_2 \geq 1$$

$$k = k_1 + k_2 \leq \text{n} - 1$$

Everywhere,

k_1 shows the core variables.

k_2 shows the auxiliary variables.

k means the sum of all explanatory variables.

In regressor X_{1i} is the core variable of this research $i = 1,2,3$. While X_2 regressors have or have not relation with y, but are included in the model also not the focus of this research. That's the

reason that regressor's belong to X_2 were named as "auxiliary variable". The reason to include X_2 that they may some potential to explain that variables and If we didn't include bias results may create.

However, different model are formed when the estimator β_2 cover k_1 components that are of auxiliary variables. if we set $k_1 = 0$ then we don't have any model selection take place. If we take $k_1 = 1$ then one is a restricted model was called and the other unrestricted model is from which mean two models is formed. So, it depends on the number of k_2. If the $k_2 = 2$ then four different types of model are formed in which two are partially restricted which mean that the two$\beta_2$it's is zero. While the other two were the same as the above fully restricted and fully unrestricted model was formed. In general, the number of possible models to consider is 2^{k_2} models.

4.2 Un-Restricted Least Square

According to the given assumption by Magnus et.al (2010) set some assumption for estimation of the un-restricted least square (LS) estimators for β_1 and β_2 which are as under:

$\hat{\beta}_1 = \hat{\beta}_{1r} - Q\hat{\beta}_2$ $\qquad\qquad$ $\hat{\beta}_{2} = X_{2'} \mathcal{M}_1 y$

Where,

$\hat{\beta}1r := (X_1' X_1)^{-1} X_1' y$ (r shows restriction β_2=0)

$Q := (X_1' X_1)^{-1} X_1' X_2 (X_2' M_1 X_2)^{-1/2}$

$\mathcal{M}_1 := I_n - X_1 (X_1' X_1)^{-1} X_1'$

4.3 Restricted Least Squares

The specified postulation restricted LS estimators of β_1 and β_2 are:

$\hat{\beta}_{1i} = \hat{\beta}_{1r} - QW_i\hat{\beta}_2$, $\hat{\beta}_{2i} = W_i\,\hat{\beta}_2$

Where

$W_i := Il_2 - S_iS_i'$

The diagonal of a matrix are represent by *Wi* with $k_2 x\, k_2$ order. It has k_{2i} ones and $k_2 - k_{2i}$ have zeros in it's diagonal, such that if ($\beta_{2j} = 0$) then the diagonal component of this matrix j[th] will be equals to zero otherwise it would be one. If k_{2i} is equals to k_2 then the *Wi* must be equal to Ik_2.

The selection matrix of S_i will be ordered $k_2 \times (k_2 - k_{2i})$ in which the column rank was full and $0 \leq k_{2i} \leq k_2$, so $S_i' = (k_{1i} - k_{2i}: 0)$. Our concentration is in the restricted estimators of β_1 and β_2 so the imposed restriction should be there $S_i'\beta_2 = 0$.

The combined distribution of $\hat{\beta}_{1i}$ and $\hat{\beta}_{2i}$ is as follows:

$$\begin{pmatrix}\hat{\beta}_{1i}\\ \hat{\beta}_{2i}\end{pmatrix} \sim N_l \left(\begin{pmatrix}\beta_1 + QS_iS'_i\beta_2\\ W_i\beta_2\end{pmatrix},\ \sigma^2 \begin{pmatrix}(X_1'X_1)^{-1} + QW_iQ' & -QW_i\\ -W_iQ' & W_i\end{pmatrix}\right),$$

The term of residual is well-defined as, $e_i = D_{yi}$ Where, $D_i = M_1 - M_1X_2\, W_i\, X_2'\, M_1$ is a symmetric idempotent matrix. The distribution in which $S^{2i} = e_i'\, e_i\, /\, (n - k_1 - k_{2i})$ is:

$$\frac{(n-k_1-k_{2i})s_i^2}{\sigma^2} \sim \chi^2\,(n - k_1 - k_{2i},\ \frac{\beta_2's_iS'_i\,\beta_2}{\sigma^2})$$

if σ^2 is indefinite then we can replace it by S^2.

4.4 The Equivalence Theorem:

The theorem was provided by Magnus and Dani lov (2004). According to this theorem for WALS β_i an estimator is defined :

$$b_1 = \sum_{i=1}^{2^{l_2}} \lambda_i \hat{\beta}_{1i}$$

where the sum is taken for all 2^{l_2} changed models attained by setting a subset of β_2's = zero. In which λ_i are considered the model weights, content the following circumstances:

1. $0 \leq \lambda_i \leq 1$
2. $\sum_i \lambda_i = 1$
3. $\lambda_i = \lambda_i\ (M_1 y)$

With the help of the Precision of Var-Cov matrix weights were assigned to each model.

$\lambda_i = \ \Sigma_i^{-1}\ (\Sigma_1^{-1}\ + \Sigma_2^{-1} + \ ... + \ \Sigma_i^{-1}\ )^{-1}$

Σ_i^{-1} is the model matric of Var-Cov matrix *i.*

Furthermore, the estimate of t-statistic of b_1 in WALS estimator we need to find standard error of estimators, for which we drive $var\ (b_1)$ is defined :

$$var(b_1) = \ \sigma^2\ (X_1'\ X_1\ )^{-1} + Q var\ (b_2) Q$$

then $\quad var(b_2) = \ \sigma^2 \sigma_n^2\ P\ \wedge^{-1}\ P'$

Where, $\sigma_\eta{}^2 = 2/C^2$ also $\quad C = \log 2$.

. σ^2 is unknown so it is substituted by S^2, which is defined by Magnus et.al (2004) in equivalence.

In equivalence theorem, Magnus et at. (2004) explain that Λ is a diagonal matrix and *P* represented an orthogonal which were calculated by diagonalization of $P'X_2'M_1X_2P = \Lambda$. According to him, the theorem defined as $S^2 = (y\text{-}X_1b_u\text{-}X_2\hat{\beta}_2)'\,(y\text{-}X_1b_u\text{-}X_2\hat{\beta}_2)/(n\text{-}k_1\text{-}k_2)$.

4.5 Unit Root Test

To begin with cointegration between the financial sector and real economic growth we have to check, in the initial step, whether each and every series are stationary or non-stationary by using the Augmented Dickey-Fuller (ADF) test. If series are stationary, then we didn't proceed but if series have unit root then we go to the next step. Null hypothesis H_0 of ADF is that series have unit root while the alternative hypothesis H_a is that series have no unit root. Now if the calculated value is higher than Mckinnon's critical value then we reject H_0 and considered that variables have a unit root. If not, then it is stationary.

$$\Delta Y_t = a_1 + a_{2^t} + \gamma Y_{t-1} + \sum_{j=1}^{k} \beta_j \Delta Y_{t-1} + e_t$$

Here Δ is show the first difference operator, Y denoted the variable in which we are interested a_1 shows the intercept , t shows time duration , $\Delta Y_t s$ are the augmented terms, k represented the lag length of the augmented term while e_t is a white noise error term.

4.6 Cointegration Tests

After the existing unit root (H_0 is accepted mean having unit root) are present in the series then the possibility of the co-integration test is required to check the stable long-run relationship among variables. The cointegration is based on the VAR approach introduce by Johansen in 1988. Johansen approach based on p-dimensional VAR of order k which is specified as:

$$Y_t = \alpha + \Pi_1 y_{t-1} - \Pi_2 y_{t-2} \ldots . \Pi_k y_{t-k} + e_t$$

Here Π and θ are n by n matrices of unknown parameters and er is the white noise term.

In 1990 Johansen and juselius develop two test ratio likelihoods.

1) Maximum Eigenvalue.

2) Trace test

Both are used to check the long-run relation. If the Eigen term or trace value is greater than the critical value, then there is cointegration.

4.7 Modeling Relationship between Financial Development & Real Economic Growth through WALS Methodology

By identifying, the relationship between the financial sector and real sector, in our situation the simple model will be;

$$RS_t = \alpha_0 + \beta_1 FS_t + +\beta_2 Lab_t + +\beta_3 Cap_t + \beta_4 X_{2t} + \varepsilon_t \quad \ldots (3)$$

$$t = 1,2,\ldots,T$$

RS = Real Sector (GDP -FS)

FS = Financial sector (financial sector)

Cap = Gross fixed Capital formation

Lab = Labor Force

X_2= auxiliary variables

There is a very long list of control variables, but many of them don't have sufficient data and many others were found significant in the earlier study. This study will be used the regressor which is mostly used by previous studies.

4.8 Data Description

Annually time series data is collected from 2000-2017 of financially developing South Asian countries but many countries were not listed due to the unavailability of data like Bangladesh, Nepal, Bhutan, Maldives, Afghanistan, and Iran. So, we select Pakistan, India, Sri Lanka, China, Japan, and Malaysia countries due to the availability of data.

The data source of auxiliary variables is collected from two different sources number one world development indicator (WDI) and the second International-Country-Risk-Guide (ICRG). The data of the financial sector (financial and insurance) are collected from the Asian Development bank. As we included the other main variables of growth Capital formation and Labor Force their data is also collected from WDI. Real sector data were generated by taking the difference from Gross Domestics Product of financial and insurance.

The main core variable of this study is Financial sector growth. we intend to use the exact amount of financial sector we have to includes all the financial actions, financial activities if it is bank-based. We also include insurance services which are also called market-based financial activities. It generally covers the entire financial sector which previously did not use in research work. As we want to check the effect of the financial sector on the growth of the real sector so we do not underestimate the human capital and capital formation. The model formed in our case are;

$$RS_t = \alpha_0 + \beta_1 FS_t + \beta_2 Cap_t + \beta_3 Lab_t + Auxiliary\ Variables \quad \ldots (4)$$

Table 1: Data Source and Data Description

DATA Source and Description		
Variables	**Description**	**Source**
GDP	Gross Domestic Product (Current US $)	WDI
Financial Sector (FS)	Financial Services and Insurance (Current US $)	ADB
Labor Force (Lab)	Labor force (total)	WDI
Capital Formation (Cap)	Gross Fixed Capital Formation (current US $)	WDI
Political Right	Political Right (Index)	ICRG
Military expenditure	Military expenditure (current US $)	WDI
Rule of law	Rule of law (Index)	ICRG
Inflation	Consumer Price Index	WDI
Unemployment rate	Unemployment rate	ADB
Life expectancy	Life expectancy at birth total (years)	WDI
Government Stability	Government Stability (Index)	ICRG
Exports	Exports of goods and services (current US$)	WDI
Imports	Imports of goods and services (current US$)	WDI
Primary School enroll	School enrollment, primary (% gross)	WDI
Secondary School enroll	School enrollment, secondary (% gross)	WDI
GDP growth	GDP growth (annual %)	WDI
Population growth	Population growth (annual %)	WDI

Chapter 5

Results and Analysis

Two groups divided the outcomes and analysis. Pakistan, India, and Srilanka are in one group and China, Japan and Malaysia belong to another group. In section 5.1, the relationship between the financial sector and real economic growth for Pakistan, India, and Srilanka is discussed. In section 5.2, the relationship between the financial sector and real economic growth for China, Japan and Malaysia are discussed. In the 5.3 section, we examine the long-run relationship.

5.1 Relationship between Financial sector & real economic growth of Pakistan, India & Srilanka

The following table 4.1 depicts the effect of the financial sector on the real economic sector of Pakistan, India, and Srilanka after controlling all the potential growth determinants in growth regression. Our core variable is the financial sector but capital formation in addition labor force are also included in focus. According to the coefficient associated with the financial sector appear positive but insignificant in Pakistan as well as in India. This means that the financial part may have a positive influence on real growth in Pakistan but it does not significantly affect the behavior of the real sector. The coefficient related to the financial sector indicates that a one percent change in the financial sector brings about a 0.2464 percent change in the real sector economy of Pakistan and 0.131 percent for India and -0.156. While the coefficient associated with Srilanka shows a negative sign. But this relationship cannot be interpreted in the case of Pakistan, India, and Srilanka because the t-state is less than 2. The present study is also in line with Loayza & Ranciere (2002), Favara (2003), Acaravci et al,. (2009), Lieng and Richaert (2006) and Samargandi *et al*., (2013) that is an insignificant outcome of the financial sector on the real side of economic growth.

Table 2 : Impact on Real sector (Pakistan, India and Srilanka)

Variables	Pakistan	India	Srilanka
Financial Sector	0.246 (0.72)	0.131 (0.26)	-0.156 (-0.52)
Labor force	0.402 (1.95)	-4.335 (-0.64)	1.25 (0.33)
Capital formation	0.089 (0.19)	0.522 (1.20)	0.67 (1.61)
Political Right	-0.066 (-0.93)	-1.92 (0.00)	-0.014 (-0.21)
Government Stability	0.008 (0.4)	0.002 (0.18)	-0.002 (-0.03)
Rule of law	0.065 (1.06)*	0.228 (1.53)*	-0.067 (-0.60)
Military expenditure	-0.35 (-0.7)	-0.036 (-0.17)	0.273 (0.63)
Unemployment rate	-0.038 (-1.38)*	0.512 (0.57)	0.013 (0.15)
Inflation	-0.003 (1.14)*	0.016 (0.75)	-0.002 (-0.32)
Exports	0.012 (0.07)	0.215 (0.64)	0.178 (0.25)
Imports	-0.254 (-0.81)	-0.169 (-0.56)	-0.167 (-0.26)
Life expectancy	0.192 (1.63)*	-0.01 (-0.08)	0.149 (1.70)*
Primary School enroll	0.004 (0.48)	0.004 (0.47)	0.016 (0.63)
Secondary school Enroll	0.015 (-0.56)	0.013 (1.14)*	-0.029 (-0.66)
GDP growth	0.012 (0.69)	0.019 (0.77)	0.003 (0.11)
Population growth	0.754 (2.18)*	-1.788 (-0.42)	-0.248 (0.46)

Source: author

We have also included other important growth variables in the focused side of regression like Labor Force and the other is Capital Formation. The coefficient of labor force shows positive but insignificant in Pakistan and Srilanka which means that if a 1 percent change occurs in the labor force it will be increased 0.4020 percent in the real sector. De la Fuente and Doménech (2000), (2006) also find positive and significant, the results show that in both orders at a level and at in first-order differences.

The other main variable is capital formation which has also positive coefficient but insignificant, in Pakistan, India, and Srilanka. Due to insignificant results, there is no need to interpret the results because capital formation has no relation to real economic growth

Now proceed to auxiliary variables results. In all the three countries Political right shows a negative sign which is also insignificant. The study line with North and Thomas (1973), (1990) has claimed that secure property rights are no important for growth. Helliwell (1992) used the data of nighty countries (1960-1985) also say that they have a negative, however statistically not significant, impact on the growth side

Government stability has contained positive coefficients sign but insignificant for all the three countries. According to Feng (1997) that, due to irregular changes in the government occurs they cause a negative impact on growth.

The coefficient associated with the rule of law have shown positive relation but significant in Pakistan and India. The present study is in line with Collier (2009), Montalvo, J. G., & Reynal-Querol, M. (2003), Haggard, S., & Tiede, L. (2011). which also find a significant impact on rule of law on economic growth.

Military expenditure has a negative coefficient and insignificant for Pakistan, India, and Srilanka. This is in line with Dunne *et al.* (2005), Dunne, & Tian (2013), Asseery (1996), Ward and Davis (1992), Dunne and Vougas (1999) and finds also not significant.

Unemployment has a positive coefficient but they are insignificant in India and Srilanka. Harris ve Silverstone (2001), Sögner and Stiassny (2002), Huang and Lin (2008), Villaverde ve Maza (2009), Meyer ve Taşçı (2012), Huang and Yeh (2013) in general support that unemployment and economic growth have an inverse connection.

Inflation contains a negative coefficient and significant in Pakistan but in India and Srilanka is shows an insignificant impact. Kearney and Chowdhury (1997) also find a bi-direction relation in 70 countries. Results were quite interested some time relation was positive and some negative. while Fischer (1993) suggests that it is not good for the long term.

Exports have a positive coefficient but show an insignificant effect on economic growth in Pakistan, India, and Srilanka. The study in line with Levine & Renelt (1992), Greenaway & Sapsford (1994a) Sala-i-Martin (1997), Clarke & Ralhan (2005) and Mamun & Nath (2005) whose also find a positive relationship of export but significant.

The coefficient associated with imports shows a negative relation with real economic growth and which insignificant as well in all the three countries. The study in line with Kotan & Saygılı (1999), Riezman et al. (1995), Ramos (2001) and Humpage (2000) who found that imports are not significant.

Life expectancy shows a positive and significant relationship in the case of Pakistan and Srilanka. Many theories also suggest that life expectancy has positive relation with growth includes Kalemli-

Ozcan et al. (2000), Boucekkine et al. (2002), Boucekkine et al. (2003), Blackburn and Cipriani (2002), Lagerlöf (2003), Cervellati & Sunde (2005), among others.

The coefficient associated with Primary education is positive. While the t-stat is less than 1 which is insignificant in Pakistan, India, and Srilanka. Secondary education contains negative sign and insignificant relation in Pakistan and Srilanka but in India its show significant relation. Kalaitzidakis et al. (2001) also suggested nonlinear insignificant effects of schooling on growth.

GDP growth shows a positive relation. Rehman et al (2010) also study in the case of all three countries. A large part of the share used by public spending which allocated to the non-development sector which results from unsatisfactory impact economic growth.

The population growth coefficient is positive and significant. Which shows that in Pakistan Population growth has a good impact on economic growth. some others like Kaldor (1966), Ghali (1998) and Kolluri (2000) also to find positive and significant relationships. While in India and Srilanka the population growth coefficient is negative and insignificant. This shows that in these countries population growth has a bad impact on economic growth. The present study is also in line with Mankiw et al. (1992), Simon (1996) and samargand et al. (2015).

5.2 Relationship between Financial sector & real economic growth of China, Japan & Malaysia

The following table 4.3 enlightens the result of financial sector on the real sector of China, Japan, and Malaysia after controlling all the potential growth determinants in growth regression. Our main variable is financial sector but capital formation, as well as labor force, are also included in focus. According to the coefficient associated with financial sector appear negative but

insignificant. This means that the financial sector has a negative impact on real sector of China, Japan, and Malaysia but it does not significantly affect real sector growth.

Our present research opposes Christopoulos & Tsionas (2004), the supply side leading theory including that financial development contributes to economic growth. The results are also in favor of king & Levine (1993) hypothesis and his supporters Levine & Zervos (1998), Rajan & Zingales (1998), Beck *et al.* (2000), Al-Malkawi & Abdullah (2011) among others that financial development will have an important and positive long-standing effect on economic growth. The outcomes of research, which supported Dawson (2003) discovered that financial development had negligible effects on economic growth. The research findings are also consistent with Acaravci et al., (2009), Grei et al. (2009), Al-Zubi *et al.* (2006), Liang and Richert (2006), and Harrison et al. (1999) that the long-term economic growth effect of the financial sector is negligible.

Labor force and Capital Formation are also included. The coefficient related to the labor force is negative as well as not significant for all countries China, Japan, and Malaysia. which means that the labor force has no impact on real economic growth. De la Fuente and Doménech (2000), (2006) also find insignificant, the results show that in both orders at a level and at in first-order differences. The study in line with Barro (1999) Dixon and Boswell (1996) and Levine and Renelt (1992). The other main variable is capital formation which has also a positive coefficient but insignificant, in the case of China and Japan. Which mean that capital formation has no impact on real growth. while in Malaysia capital formation is significant.

Table 3 : Impact on Real sector (China, Japan and Malaysia)

Variables	China	Japan	Malaysia
Financial Sector	-0.113 (-0.16)	-0.081 (-1.06)	-0.079 (-0.58)
Labor force	-1.252 (-0.519)	-0.583 (-0.44)	-1.123 (-1.09)
Capital formation	0.433 (0.6)	0.778 (1.74)	0.465 (2.91)
Political Right	-0.013 (-0.55)	-0.023 (-0.6)	-0.057 (-1.11)*
Government Stability	-0.019 (-0.67)	-0.002 (-0.49)	-0.001 (-0.17)
Rule of law	-0.029 (-0.47)	-0.3 (-1.09)*	-0.076 (-1.09)*
Military expenditure	0.35 (0.67)	0.303 (0.68)	0.041 (0.54)
Unemployment rate	0.198 (0.58)	0.022 (0.54)	0.096 (0.9)
Inflation	-0.003 (-0.027)	-0.0066 (-0.65)	0.004 (1.39)*
Exports	0.359 (1.15)	0.148 (0.72)	0.804 (3.87)*
Imports	-0.274 (-0.66)	-0.073 (-0.44)	-0.142 (-0.63)
Life expectancy	0.15 (0.87)	0.0226 (1.35)*	0.413 (2.48)*
Primary School enroll	0.004 (0.66)	0.003 (0.16)	0.01 (0.66)
Secondary school Enroll	0.005 (0.59)	0.001 (0.07)	0.009 (0.29)
GDP growth	0.051 (0.64)	0.002 (0.62)	0.001 (0.6)
Population growth	0.987 (0.68)	-0.046 (-0.3)	0.229 (0.93)

Source: author

Now proceed to auxiliary variables results. Political right shows a negative sign which is also insignificant for all three countries. The study line with North and Thomas (1973), (1990) has claimed that secure property rights are for growth. Helliwell (1992) used the data of nighty countries (1960-1985) also say that they have a negative, estimate not a significant impact on the growth of the real side.

From the above government, stability has contained negative signs but insignificant in China, Japan and Malaysia. According to Feng (1997) that, due to irregular changes in the government occurs they cause a negative impact or no impact on growth.

The coefficient associated with the rule of law has shown negative relation while t-stat is greater than 1 show significant impact in Japan and Malaysia. The present study is in line with Hoeffler and Reynol Querol (2003) as well as Hoeffler and Soederbaum (2006), and Collier (2009).

Military expenditure has a positive coefficient which shows a positive impact on economic growth but due to insignificant we are not sure. The study is in line with Dunne *et al.* (2002), Dunne and Vougas (1999) and Asseery (1996), and find also the same results.

Unemployment has a positive coefficient but they are insignificant for all three countries. In this case, we didn't need to interpret due to insignificant. Huang and Yeh (2013) and Meyer ve Taşçı (2012), also in favor of inverse relations. Villaverde ve Maza (2009), Harris ve Silverstone (2001), Sögner and Stiassny (2002), Huang and Lin (2008), in general support that unemployment and economic growth have an inverse connection with growth.

Inflation contains a negative coefficient and insignificant in china and japan but significant in Malaysia. Kearney and Chowdhury (1997) also find bi-direction relations in 70 countries. Results

were quite interested some time relation was positive and some negative. while Fischer (1993) suggests that it is not good for the long term.

Exports have a positive coefficient and show significant effects in China and Malaysia. The study in line with Clarke and Ralhan (2005) and Mamun and Nath (2005), Sala-i-Martin (1997) and Levine and Renelt (1992) whose also find a positive relationship of export and significant. Which shows that's export has a good impact on economic growth.

The coefficient associated with imports shows a negative relation with real economic growth and which insignificant as well for all the three countries. The study in line with Kotan and Saygılı (1999), Riezman et al. (1995), Ramos (2001) and Humpage (2000).

Life expectancy shows positive and insignificant relationships in China while in Japan and Malaysia it shows significant results. Many theories also suggest that life expectancy has positive relation with growth includes Kalemli-Ozcan et al. (2000), Boucekkine *et al*. (2002),(2003), Cervellati and Sunde (2005), Lagerlöf (2003), Blackburn and Cipriani (2002), Bar and Leukhina (2011), among others.

The coefficient associated with Primary education is positive for China, Japan, and Malaysia. While the t-stat is less than 1 which is insignificant. Secondary education contains a positive sign and an insignificant relation. Kalaitzidakis et al. (2001) also suggested nonlinear insignificant effects of schooling on growth.

GDP growth shows a positive relation but insignificant for three counties. Rehman et al (2010) also suggested that the large part of the share used by public spending which allocated to the non-development sector which results from an unsatisfactory impact on economic growth.

The population growth coefficient is positive and insignificant. This means that in China, Japan and Malaysia population growth has no effect on real economic growth. Mankiw *et al*. (1992), Simon (1996) and samargand et al. (2015) also find the same results.

5.3 Long-run relationship

As the second objective of the research is to check the long-run relationship. For checking the long run-relationship cointegration test is used. Before going to the cointegration process stationarity of data must be checked.

5.3.1 Unit root test

Here we apply the Augment Dicky-full test to examine the stationarity.

H0: Variables contain a unit root.

H_1: Variables did not contain a unit root.

Table 4 : Unit Root Test Result

	Real Sector		**Financial Sector**		**Labor Force**		**Capital Formation**	
Country	**t-adf**	**Prob**	**t-adf**	**Prob**	**t-adf**	**Prob**	**t-adf**	**Prob**
Pakistan	-0.942	0.925	-2.144	0.480	-0.686	0.824	-3.09	0.14
India	-0.366	0.979	-0.207	0.986	-0.965	0.738	-0.806	0.944
Srilanka	-1.039	0.909	-1.096	0.899	-2.790	0.218	-2.170	0.474
China	-0.068	0.990	-1.057	0.706	-0.755	0.950	-2.073	0.256
Japan	-1.944	0.588	2.107	0.503	-2.299	0.183	-2.985	0.163
Malaysia	-0.859	0.937	-1.921	0.315	-1.198	0.869	-1.066	0.905
The above significance level represent *, **, and *** which are as follows 1%, 5%, and 10%.								

In the above table 5.3 shows the results of the ADF-test of variables Real sector, financial sector, labor force and capital formation for Pakistan, India, Srilanka, China, Japan, and Malaysia respectively. From results, it is obtained that all variables are non-stationary on at level for six countries so we go for co-integration test. As we have more than two variables thus we used JJ-test “Johansen and juselius co-integration test”.

5.3.2 Co-integration

As the ADF results show that all variables have unit root so we go for a co-integration test. Here we used Johansen and juselius co-integration test to check the long-run relationship in the real sector and other independent variables financial sector, Labor force, and Capital Formation. In the following table 5.4 JJ- test is applied to data sets of each country individually to find their long-run relation.

The below estimated results are shows that the total four variables which are the Real Sector, Labor Force, Financial Sector and Capital Formation are co-integrated if the value of trace statistic bigger than critical value or probability value is less than 0.05, then long-run relation exists. So, according to the below table in Pakistan, Malaysia and Japan only the labor force is significant and has a long-run relationship with the real sector. While the financial sector and capital formation are insignificant thus, the long-run relationship does not exist. In India and Srilanka all the four variables have variables are significant. Which mean that the long-run relations exist between the real sector and the financial sector, Labor force, and capital formation. In China, capital formation is insignificant while the financial sector and labor force are significant which means that long-run relations only exist in only two variables.

Table 5 : Johansen.J co-integration test

Rank Test (Trace) Cointegration test								
	None		**At most 1**		**At most 2**		**At most 3**	
Countries	T.stat	Probb	T.stat	Probb	T.stat	Probb	T.stat	Probb
Pakistan	84.02	0.00**	38.58	0.003**	13.63	0.09	2.72	0.09
India	69.52	0.00**	40.65	0.001**	23.00	0.003**	7.87	0.005**
Srilanka	67.22	0.00**	37.60	0.005**	15.93	0.04**	4.73	0.02**
China	82.79	0.00**	41.33	0.001**	15.51	15.51**	1.02	0.311
Japan	54.38	0.01**	28.72	0.06**	8.88	0.37	2.86	0.09
Malaysia	90.19	0.00**	38.33	0.00**	14.92	0.06	2.09	0.14

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level.

**MacKinnon-Haug-Michelis (1999) p-values.

Chapter 6

Conclusion and Policy Implications

6.1 Concluding Remarks

In the current research, we talk about the effect of financial sector development on real economic growth. our work is restricted only for Pakistan, India, China, Japan, Malaysia, and Srilanka. Data are collected from the year 2000 to 2017. By applying the WALS approach we inspect the connection between real sector growth plus financial sector growth. Our findings suggest that Pakistan and India have a positive relationship with financial sector growth and real sector growth but not significant while China, Japan, Malaysia, and Srilanka have a negative impact but it is also insignificant. The current research contrasting the hypothesis of Almalkawi & Abdullah (2011) and Beck, et al. (2000). Which are the followers of King and Levine (1993) and Levine & Zervous (1998), among others which supports that the financial sector has a progressive and significant impact on economic activities? The WALS estimation also shows an insignificant relationship between real sector growth and financial sector growth. The current study is in the favor of Greis *et al.* (2009), Liang and Richert (2006) and Dawson (2003) among others that the impact of the financial sector on the real sector is not significant.

We separate our study from the other studies in two ways. First, the past studies empirically have seriously flawed. They try to find the relationship between GDP and financial development, but it is almost sure that they have a positive relationship because the financial sector is also part of GDP. Consequently, we want to investigate the impact on both the financial sector and the growth of the real sector. it will be only done if we subtract FS from GDP then remains part is called real sector growth.

Second, for the financial sector, we used the correct measure in dollar values, which are not previously used. All the researcher uses some proxy which didn't give the actual idea. The estimated results through "Weighted Average Least Square" (WALS) show the insignificant results of the financial sector on real sector growth in all selected six countries. The results advocate for both the financial sector and real economic growth were not moving together which creates financial bubbles. When these bubbles burst it will hit the economy badly.

Henceforward, the current research concludes that enhancement in the financial sector was not that effective and expanding in real economic growth. which mean that for both sector equal importance should be given.

6.2 Policy implications

This research indicates the financial sector has an insignificant effect on real sector growth. As far real growth is the highest core part in which the economy of a country depends. However, considered the investment, if increased in financial sector development we focus less on the real sector. When the share of investment increase in the financial sector then the real sector investment decrease the result shows a negative influence on the economy. The past research also identifies the reason for the financial crisis Kaminskey & Reinhart (2003), Gennaioli et al. (2010), Blanchard et al. (2010), IMF (2010), and Lane and Milesi-Ferretti (2010) among others.

6.3 Study Limitations

Our research effort is restricted in the case of Pakistan, India, China, Japan, Malaysia and Srilanka due to the availability of data. Data for many low developed or developing countries are not presented for a long period of time. Hence, this study is restricted only to these six countries. Later, the study will be extended if other countries' data were available.

6.4 Future Research Direction

More research will be required to find the relationship of the real sector as well as the financial sector with other macroeconomic variables like inequality, employment, broad money, poverty and other long term development of the economy.

The outcomes of this researcher propose several promising guidelines for future research. First, it would be interesting to test the nexus between the financial and real sector technologies and economic growth for other individual countries. Secondly, the effect of financial liberalization, after unexpected changes in the political regime, would also be interesting to study.

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